“Public Perceptions and Utilisation of Automated External Defibrillators(AEDs) in Ireland: A quantitative and qualitative analysis of awareness, confidence and barriers to AED use in 2025.”

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Candidate Declaration

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I hereby declare that this thesis, entitled *'Public Perceptions and Utilisation of Automated External Defibrillators(AEDs) in Ireland: A quantitative and qualitative analysis of awareness, confidence and barriers to AED use in 2025',* submitted for the degree of MSc in Medical Device Technology and Business, is a result of my own work. Due acknowledgment has been given where the reference is made to the work of others. I declare I have not plagiarised the work of anyone else, either partially or entirely, including the work of other students.

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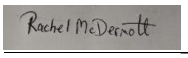
Candidate Signature: 

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Abbreviations

AED	Automated External Defibrillator
AHA	American Heart Association
AI	Artificial Intelligence
ALS	Advanced Life Support
ANOVA	Analysis of Variance
Approx.	Approximately
BET	Bystander Effect Theory
BHF	British Heart Foundation
BLS	Basic Life Support
CA	Cardiac Arrest
CE	Conformité Européenne (European Conformity)
CF	Conceptual Framework
CFR	Community First Responder
CI	Confidence Interval
CPR	CardioPulmonary Resuscitation
DIT	Diffusion of Innovation Theory
E.G.	Example
EMS	Emergency Medical Services
ERC	European Resuscitation Council
EU	European Union
F	Female (in appendix tables only)
F	F-static
FDA	Food and Drug Administration
GAA	Gaelic Athletic Association
GDPR	General Data Protection Regulation
GIS	Geographic Information Systems
GSL	Good Samaritan Laws
H (Cohen's h)	Effect size
H0	Null Hypothesis
Ha	Alternative Hypothesis
HBM	Health Belief Model
HIQA	Health Information and Quality Authority
HSE	Health Service Executive
HTA	Health Technology Assessment
ICF	Informed Consent
IHF	Irish Heart Foundation
M	Male (in appendix tables only)
M	Mean
n	number
NAS	National Ambulance Service
NDA	Non-Disclosure Agreement
OCHAR	Out-of-Hospital Cardiac Arrest Register
OHCA	Out-of-Hospital Cardiac Arrest
OR	Odds Ratio

P (value)	Probability
PAD	Public Access Defibrillation
PADSs	Public Access Defibrillation Schemes
Pg	Page
PIL	Participant Information Letter
PMA	Pre-Market Approval
R	Correlation coefficient
ROSC	Return of spontaneous circulation
SADS	Sudden Arrhythmic Death Syndrome
SCA	Sudden Cardiac Arrest
SCD	Sudden Cardiac Death
SCT	Social Cognitive Theory
SD	Standard Deviation
TAM	Technology Acceptance Model
TDF	Theoretical Domains Framework
TPB	Theory of Planned Behaviour
USA	United States of America
UTAUT	Unified Theory of Acceptance and Use of Technology
Vs	Versus
Z	Z-score
α	Significance Level
β	Standardised regression coefficient
η^2	eta squared for variance
η^2p	Partial eta squared – measures effect size
χ^2	chi-squared

Abstract

Public Perceptions and Utilisation of Automated External Defibrillators (AEDs) in Ireland: A quantitative and qualitative analysis of awareness, confidence and barriers to AED use in 2025.

Rachel McDermott

Out-of-hospital cardiac arrest (OHCA) affects approximately 5,000 people annually in Ireland, with survival rates as low as 8.4%. Automated External Defibrillators (AEDs) can significantly improve survival outcomes if utilised within 3-5 minutes of cardiac arrest. Despite approximately 9,000 AEDs nationwide, public utilisation rates remain critically low at 11% pre-emergency medical services arrival, highlighting a significant gap between device availability and effective public intervention. This study comprehensively investigated public perceptions and utilisation patterns of AEDs across Ireland in 2025. Key objectives examined: (1) associations between demographics and AED knowledge, (2) perceived barriers versus understanding levels, and (3) relationships between awareness levels and demographic responses. A mixed-methods approach employed both electronic (n=379) and hard copy (n=6) surveys. The predominantly quantitative questionnaire assessed AED awareness, confidence levels, training exposure, and perceived barriers, analysed using descriptive and inferential statistics. Qualitative data, from the open-ended questions, were analysed using Braun and Clarke's six-phase thematic analysis framework. Results revealed significant knowledge and confidence gaps. Only 76.1% of respondents knew AED locations within their community, while confidence in recognising when to use an AED was low (average self-efficacy score: 2.8 on a 5-point scale). Willingness to intervene varied by social context, demonstrating a bystander effect: 37% were very likely to use an AED when alone versus 27% in large groups. Key barriers included lack of knowledge or training (56%), fear of causing harm (47%), anxiety about taking responsibility (22%), and legal concerns (18%). Training emerged as the strongest predictor of intervention likelihood (66%). Gender disparities were evident, with females showing significantly higher fear of causing harm (86% vs 36% for males). Geographic concentration in Dublin (76%) limited rural representation. These findings underscore persistent deficits in AED awareness, confidence, and action readiness. Current public education approaches appear insufficient to overcome complex utilisation barriers. Effective AED utilisation requires multi-modal strategies simultaneously addressing legal, technical, and psychological barriers through demographic-responsive training, policy initiatives, and awareness campaigns to bridge the critical knowledge-action gap and improve OHCA survival outcomes.

Keywords: AED knowledge, cardiac arrest, public awareness, bystander intervention, Ireland, mixed-methods research

Chapter 1: Introduction

1.1. Overview

This introductory chapter establishes the foundation for conducting this critical research examining the public perceptions of Automated External Defibrillators (AEDs) across Ireland. This investigation is driven by the stark reality that despite over 9,000 AEDs (National Ambulance Service, 2015) deployed nationwide, suboptimal public utilisation persists. Reported by the National Ambulance Service, (2023b) only 49% (n=88) of out-of-hospital cardiac arrest (OHCA) victims were shocked in a non-emergency medical services (EMS) witnessed group of survivors (n=180), yet 80% (n=192/240) had an initial shockable rhythm. Sudden cardiac arrest (SCA) causes approximately 5,000 OHCAs annually, with survival rates persistently below 9% (National Ambulance Service, 2023a). While the use of AEDs can considerably improve survival outcomes if deployed within the crucial first 3-5 minutes after collapse. Each minute of delay in AED application decreases survival by 7-10% (Faten A. AlRadini *et al.*, 2023). Therefore, the paradox between the device availability and actual device usage poses a major health challenge that this research seeks to address.

The chapter systematically builds the case for this investigation by initially establishing the research context within Ireland's current OHCA landscape. Survival rates remain at approximately 8.4%, despite technological advances in emergency care and the implementation of government initiatives.

The chapter begins by presenting the specific research aims and objectives that guide this empirical study. Particularly focusing on the awareness levels, confidence factors, and barriers to AED utility amongst the adult population nationwide. This is achieved through the identification of the context, rationale, and scope of this study relative to this topic.

The theoretical foundation is built upon multiple behavioural frameworks, including the Theory of Planned Behaviour, Health Belief Model, and Bystander Effect theory. These frameworks collectively inform the understanding of emergency intervention behaviours.

This comprehensive approach facilitates the identification of specific research gaps and provides the conceptual framework required to bridge the disconnect between AED

deployment and effective public utilisation. Ultimately, aiming to inform the evidence-based interventions which could extensively improve the OHCA survival outcomes across Ireland.

Finally, the chapter concludes with an outline of the dissertation structure and identification of key points relative to the topic.

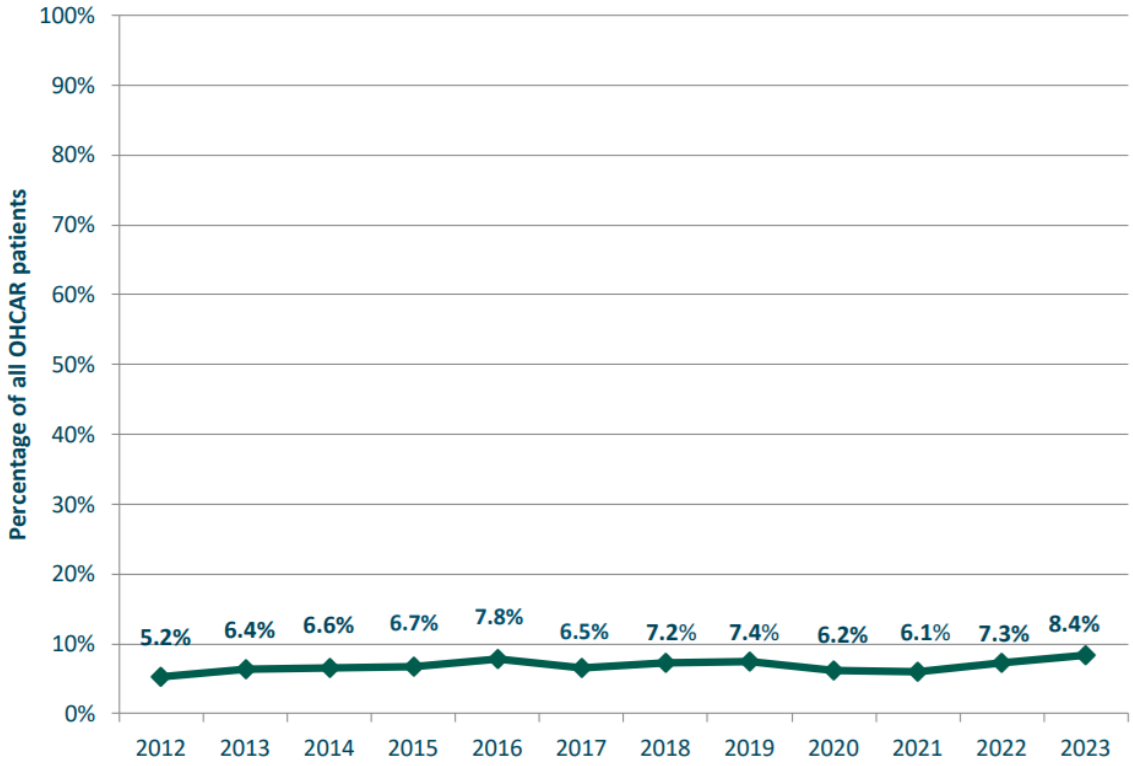


Figure 1: OHCA Survival to Discharge survival rates

1.2. Research Context and Rationale

Sudden cardiac arrest (SCA) remains one of the most prevalent causes of mortality globally. Representing a critical public health emergency with devastating consequences when immediate intervention is not provided. SCA is the third leading cause of death in Europe (Gräsner *et al.*, 2021), accounting for approximately 350,000 deaths across Europe annually (European Resuscitation Council, 2023). It is a condition causing the heart to suddenly and unexpectedly cease beating, and commonly results in death within minutes if no medical intervention is provided to the individual suffering the SCA (Yow *et al.*, 2024).

Unfortunately, many SCAs occur outside the vicinity of a hospital and are often referred to as an Out-of-Hospital Cardiac Arrest (OHCA). Over 275,000 cases involving OHCAs occur each year in Europe, over 600,000 in the United States of America (USA) and approximately 550,000 in China (Daud *et al.*, 2023). Nationally, OHCAs affect approximately 5,000 people annually (Irish Heart Foundation, 2018) with survival rates remaining critically low at just 8.4% (National Ambulance Service, 2023a). OHCA patients can encounter permanent disability or even mortality due to insufficient rescue efforts or lack of immediate intervention, underpinning the importance of accurate, timely on-site assistance (Chen *et al.*, 2024). This stark statistic underpins a fundamental paradox in emergency cardiac care. While automated external defibrillators (AEDs) are proven to increase survival rates by up to 70% when applied within the first 3-5 minutes of collapse (Faten A. AlRadini *et al.*, 2023), their utilisation during OHCAs remains disappointingly low at just 11% according to the latest reports by National Ambulance Service, (2023a).

This disconnect between device availability and actual utilisation represents a critical gap in Ireland's emergency response capability. Despite over 9,000 AEDs deployed across Ireland in public locations, including hospitality venues, sports clubs, retail premises, and transport stations (HIQA, 2017), the technology's life-saving potential remains largely unrealised. The possibility of survival of an Out-of-Hospital Cardiac Arrest (OHCA) quadruples with instant Basic Life Support (BLS) application (Faten A. AlRadini *et al.*, 2023). Early BLS intervention post SCA is critical to improving the prognosis of OHCA, which includes rapid AED application and cardiopulmonary resuscitation (CPR). This is an integral part of the third link in the patient sequence of survival. Rapid AED intervention is vital as it increases survival rates up to 50-70% if conducted within the first 3-5 minutes post collapse (Faten A. AlRadini *et al.*, 2023). This crucial timeframe often precedes the emergency medical services (EMS) arrival, with an average of 11 minutes response time and up to 25 minutes in rural locations (National Ambulance Service, 2023a). Incidentally, with each passing minute from the time of collapse to defibrillation application, the survival outcome decreases by 7-10% (Faten A. AlRadini *et al.*, 2023).

Recognising the importance of AED usage, the Irish government has implemented various initiatives to increase AED usage. This includes the reduction of 23% VAT on defibrillators and the establishment of the National Out-of-Hospital Cardiac Arrest Register (OHCAR). However, despite these policy interventions and widespread device deployment, the fundamental question remains - what factors influence public willingness and ability to utilise AEDs during cardiac emergencies. While multiple factors contribute to the gap between AED utilisation and effective bystander utility, there are key influencing factors. These factors include public awareness, confidence in device use, and perceived barriers to intervention. They are consistently identified as critical determinants of bystander actions during cardiac emergencies. Therefore, this study aims to investigate these factors amongst the public in Ireland and formulate recommendations to increase AED awareness and reduce barriers to AED utility.

1.3. Research Aim and Significance

Research Aim and Significance This research aims to comprehensively investigate the existing landscape regarding public perceptions and utilisation of AEDs across Ireland in 2025. Addressing a critical knowledge gap by systematically investigating the awareness levels, confidence factors, and perceived barriers to AED use among the current adult population in Ireland.

Extending beyond the academic inquiry this research study, aims to address a pressing public health concern. By examining the psychological, social, and structural variables influencing AED utilisation, this research will contributing evidence-based findings to inform further developments in national health policies, enhance training initiatives, and increase survival outcomes for OHCA victims. The research is very timely considering Ireland's ongoing strategic efforts to strengthen community emergency response capabilities and the recognised imperative need for improved bystander intervention rates.

1.4. Theoretical Framework

This study is grounded in well-established behavioural and psychological theories, that provide a robust framework for examining public interaction with emergency medical technology. The theoretical foundation is derived from several interrelated behaviour models.

The Theory of Planned Behaviour (Ajzen, 1991) serves as the primary theoretical lens, suggesting that behavioural intention is determined by three key factors. These include attitudes towards behaviour, subjective norms, and perceived behavioural control. In the context of AED utilisation, this framework transposes to how individual attitudes towards AED use, societal expectations regarding bystander intervention, and confidence in operational ability collectively influence intervention decisions.

Health Belief Model (Rosenstock, 1974) provides additional insight into how individuals weigh perceived benefits against perceived barriers when making health-related decisions. This model explains why some individuals, despite recognising the severity of SCAs and the effectiveness of AEDs, may still hesitate to intervene due to concerns about legal consequences or fear of causing harm.

The Decision model for bystanders / Bystander Effect Theory (Latané and Darley, 1970) addresses the social dynamics of emergency situations, explaining how the presence of others can lead to diffusion of responsibility and reduced likelihood of intervention. This theory is particularly relevant given that many cardiac arrests occur in public settings with multiple potential responders present.

Social Cognitive Theory (SCT) (Bandura, 1986) explains human behaviour through the dynamic interaction of personal factors, environmental influences, and behavioural patterns. These three factors continuously interact to shape an individual's emergency response. This theory emphasises that people learn not only through direct experience but also by observing others. This shows that the cognitive processes play a central role in determining behaviour, which is particularly valuable for designing comprehensive training programmes regarding AED utilisation.

The Technology Acceptance Model (TAM) (Davis, 1989) examines how perceived usefulness and perceived ease of use influence technology adoption. For AEDs, while most people recognise their life-saving potential, perceptions of complexity may create barriers to use, despite modern devices being designed with user-friendly features including voice prompts and visual instructions.

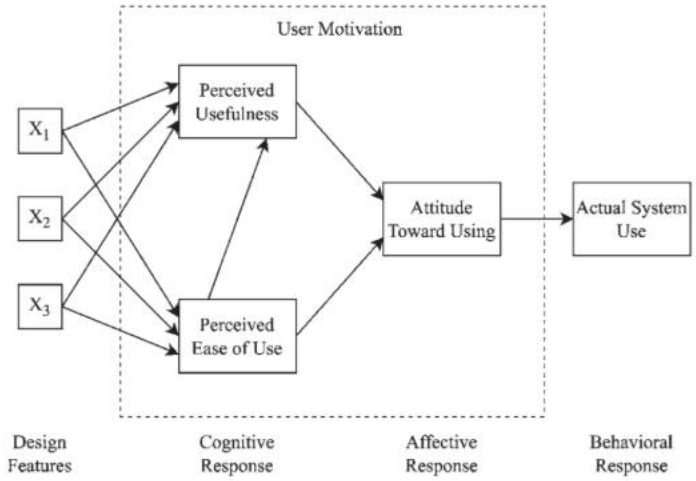


Figure 2: Technology Acceptance Model (Davis and Granic, 1986)

The Diffusion of Innovation Theory (Rogers, 1983) provides insight into how AED adoption patterns vary across different population segments, from early adopters (healthcare professionals, first responders) to late majority and laggards who may resist using AEDs due to technological fears or preference for traditional emergency response methods.

UTAUT Model (Venkatesh *et al.*, 2003) uses eight previous technology acceptance theories to predict user intentions and behaviour toward technology use. It also identifies four key determinants of technology acceptance, with relevance to AED devices in this study. These determinants include performance expectancy (belief the device will save lives), effort expectancy (perceived ease of use), social influence (peer pressure from training courses), and facilitating conditions (device availability, legal protections, and

adequate training). These factors, moderated by demographics and experience, directly relate to public confidence and barriers to AED use in Ireland (Akinnuwesi *et al.*, 2022).

Theoretical Domains Framework (TDF) (Michie *et al.*, 2005) is constructed from several theories into 14 domains that can be used to identify specific barriers or facilitators to particular behaviours (Atkins *et al.*, 2017). By capturing the complexity of factors affecting public intervention during cardiac emergencies. This framework offers valuable insights for designing targeted interventions to improve AED education, accessibility, and address social barriers that prevent utilisation during out-of-hospital cardiac arrests in Ireland ((Zhou *et al.*, 2024).

1.5. Research Questions

This investigation is structured around four interconnected research questions designed to systematically investigate the multifaceted nature of public AED perceptions:

1. What are the current levels of awareness and understanding of defibrillators among the Irish public in 2025?
2. How confident are laypersons in using defibrillators in sudden cardiac emergencies?
3. What barriers exist to the effective use of defibrillators in public places amongst adults in Ireland?
4. How can public perceptions and confidence in using defibrillators be improved through education and training programmes?

Intentionally sequenced, these questions guide the investigation from developing a basic awareness through to practical application and improvement strategies. Creating a logical progression that reflects the decision-making process bystanders encounter during cardiac emergencies.

1.6. Research Hypotheses

This study is driven by three principal hypotheses, each informed by established literature and theoretical frameworks.

Primary Hypothesis: The primary hypothesis of this research is the detection of a positive association between public awareness and confidence levels in the AED device utilisation. This hypothesis, supported by Ryan *et al.*, (2021), indicates a greater awareness contributes to a deeper understanding and subsequently increased confidence levels in device utilisation during cardiac emergencies.

Secondary Hypothesis 1: AED training significantly impacts respondents' self-perceived confidence levels in effective AED utilisation during SCAs (Thomas *et al.*, 2019). This hypothesis pertains to the vital role of experiential learning in developing emergency response capabilities.

Secondary Hypothesis 2: Demographic variance, including age, gender, educational level, and geographical location (urban versus rural), influencing awareness levels, confidence, and perceived barriers to AED use (Ryan *et al.*, 2021;Huang *et al.*, 2024).

Each hypothesis is supported by an associated null hypothesis, stating that no significant relationship or difference exists between the variables examined in this study. This facilitates robust statistical testing to determine the likelihood that observed findings are attributable to chance.

1.7. Objectives of the research

There will be various key objectives explored in detail through this research study.

Primary Objective: To investigate the association between public demographics and knowledge of AEDs, while identifying perceived barriers to use in relation to varying levels of understanding and evaluating how awareness correlates with the demographic characteristics.

The secondary objectives of this research study include:

Secondary Objectives:

1. **Assessment Objective:** To evaluate current levels of public awareness and knowledge regarding AED locations, functionality, and correct utilisation among the Irish population in 2025.
2. **Confidence Evaluation Objective:** To assess public confidence and willingness to use AEDs during cardiac emergencies, identifying factors that influence readiness to intervene.
3. **Barrier Identification Objective:** To systematically identify and analyse perceived barriers preventing effective AED use among the Irish public during cardiac emergencies.
4. **Demographic Analysis Objective:** To investigate how demographic and contextual factors influence awareness, confidence, and perceived barriers relating to AED use.
5. **Recommendation Development Objective:** To formulate evidence-based recommendations for public health initiatives and policy changes to improve AED awareness, confidence, and utilisation across Ireland.

1.8. Objectives guiding the research

The objectives of this research follow the SMART criteria principles, as outlined below:

Specific – This study aims to extensively examine the public awareness, confidence levels and perceived barriers to AED use among the Irish population through a mixed-method survey. This will provide evidence-based insights to inform national health-related policies, improve AED training and implement public health interventions.

Measurable – By integrating primary data collection with a comprehensive literature review, this study seeks to identify the factors that influence public behaviour towards AED use. The primary research will be obtained through the circulation of survey

questionnaires, both in electronic and hard copy formats. The secondary research will be acquired by an analysis of existing relevant literature.

Attainable – Through targeting the general public as the primary demographic, this maximises the recruitment potential for survey participation. The broad inclusion criteria with minimal age and geographical constraints, furnish an achievable attainment of the required research sample size. The dual approach for survey completion via either electronic or paper format facilitates a broader demographic representation and accessibility.

Relevant- This research will provide a deeper comprehension of the nuanced factors influencing the public's behaviours around AED use. Through conducting the mixed-method nationwide surveys, evidence-based insights will be acquired, which can contribute to policy updates and training programme improvements. Subsequently, this resulted in increasing bystander intervention rates and OHCA survival outcomes.

Time – this research will be completed within an approximate four-month timeframe, with systematic phasing of ethics approval, survey distribution, data collection, and analysis

1.9. Study scope and Limitations

While this research provides valuable insights into AED perceptions in Ireland, several limitations must be acknowledged to adequately contextualise the study findings**.**

Geographical restrictions: This study is geographically limited in scope to only Ireland, as the purpose of the research is to identify the factors impacting AED utilisation amongst the public of Ireland. Therefore, results derived from this study will not be applicable in an international context. Additionally, the researcher conducting the study will be Dublin-based, which will mean the majority of the results will possibly be derived from Dublin, with minority representation from other counties in contrast. This is a limitation as the results will not provide a true and accurate reflection of the public perceptions on a national level.

Restricted duration: The study was confined to a limited timeframe due to several review requirements. These included the supervisor review and feedback incorporation, a survey

piloting phase, and Griffith College ethics committee approval before survey distribution. This resulted in approximately 2 months from the receipt of ethics approval for survey distribution and circulation until submission of the research for academic review and grading.

Methodological Limitations: The predominantly quantitative approach will enable the statistical analysis of patterns and relationships. However, it may not fully capture the nuanced complexities inherent in the public perceptions of AED use. The challenge of measuring actual behaviour versus self-reported intentions represents a limitation commonly identified in survey-based research. This is particularly relevant to the survey questions regarding the bystander intervention likelihood in various scenarios.

Sample Considerations: Potential sampling biases may occur from uneven geographical distribution across Irish counties and self-selection bias among respondents willing to complete surveys about medical emergency topics. The 95% confidence level with 5% margin of error, while statistically acceptable, reflects the practical constraints of achieving larger sample sizes within the available timeframe.

1.10. Ethical Considerations and Data Management

This research adheres to rigorous ethical standards and data protection protocols. Survey distribution commenced only following approval from the researcher's supervisor and the Griffith College Ethics Committee, ensuring all procedures meet established research ethics guidelines. The data that will be collected will be maintained with strict anonymity and confidentiality. Data retention will be limited to the necessary period, approximately one year following the completion of the dissertation. All information will be stored securely on password-protected systems in compliance with GDPR and college guidelines.

Full provision for data access principles and research ethics in this context is explained in greater detail in the research design section of the methodology chapter. including comprehensive protocols for respondent consent, data retention, and secure disposal procedures.

1.11. Dissertation Structure

This dissertation is systematically structured into six interrelated chapters that progressively develop a comprehensive understanding and culminate in evidence-based recommendations.

Chapter 1: Introduction This introductory chapter establishes the foundation of the research by presenting the problem context, theoretical framework, and study parameters. It highlights the critical gap between AED availability and utilisation, while situating the research rationale within the broader framework of public health priorities.

Chapter 2: Literature Review expands on the context provided in Chapter 1. This section critically analyses the existing literature around AED awareness, confidence, and barriers to use, identifying key themes, methodological approaches, and knowledge gaps. This chapter synthesises international evidence while focusing on Irish initiatives and developments. Outlining the conceptual framework behind the research methodologies underpinning the study.

Chapter 3: Methodology provides a comprehensive overview of the research design employed. Articulating the rationale for adopting the mixed-methods approach, including both quantitative and qualitative components via a carefully constructed survey questionnaire. This chapter explains participant recruitment strategies, survey instrument development, piloting procedures, and analytical techniques while addressing ethical considerations and quality assurance measures.

Chapter 4: Results and Analysis portrays the research findings and analyses the results of the survey questionnaire. Including identification of any patterns or themes that emerged from the data. Descriptive statistics, correlation analysis, and thematic analysis, which impact the AED use and barriers impeding the AED use, will be evaluated. This section employs various data visualisation techniques to clearly present the data and provides a brief analysis of the results prior to discussing the findings in depth in the following chapter.

Chapter 5: Conclusion and Recommendations provides an interpretation and analysis of the data presented in Chapter 4, explaining the significance relative to the literature analysed in Chapter 2. This section critically examines the study's limitations and

explores the potential implications of the study. It provides evidence-based recommendations to optimise utilisation of AEDs. The discussion section synthesises key themes emerging from the survey responses provided. This facilitates contextualisation of the quantitative data and illuminating the lived experiences and perspectives of the respondents' which is formative to the Irish public engagement with AEDs. Recommendations for future research are also outlined in this section.

Appendix: Survey questions, PIL, Informed Consent form, and Ethics application form.

1.12. Summary

This introductory chapter has established a compelling foundation for examining the critical gap between AED availability and utilisation in Ireland by gaining insight into the current public perceptions of AED use across Ireland. This gap currently contributes to preventable mortality attributed to out-of-hospital cardiac arrests (OHCAs).

Through a systematic examination of the research context. This chapter demonstrated how multiple factors, including public awareness deficits, confidence barriers, and psychological impediments, interact. Upon convergence, they create a complex framework of challenges preventing effective bystander intervention despite widespread AED deployment.

The chapter provides a comprehensive research framework based on four key questions guiding the investigation. These questions focus on assessing current awareness levels, evaluating confidence in emergencies, identifying barriers to utilisation, and exploring improvement pathways through education and training. These questions are embedded in established behavioural theories, including the Theory of Planned Behaviour (TPB), Health Belief Model (HBM), and Bystander Effect Theory (BET). These questions provide both theoretical depth and practical relevance to address the challenge of OHCA survival across Ireland.

Most importantly, this chapter highlights the research significance within Ireland's urgent public health context. Illuminating the potential to increase the current 8.4% OHCA survival rate by improving public engagement with existing AED infrastructure. The theoretical frameworks presented range from individual decision-making models to

technology acceptance theories. Together, they identify that increasing AED utilisation requires addressing multiple interconnected factors simultaneously.

The research objectives, hypotheses, and methodological framework addressed within this chapter establish a robust foundation for creating evidence-based findings that can effectively guide national health policies, training programmes, and public awareness campaigns.

The following chapters will systematically build upon this established foundation. Progressing from the comprehensive literature analysis in chapter 2, through rigorous survey circulation and data collection in the methodology chapter. Followed by thematic and statistical analysis in Chapter 4. Ultimately, culminating the study in chapter 5 with actionable recommendations to bridge the critical gap between AED availability and life-saving utilisation across Ireland.

This investigation extends beyond an academic research project as it addresses a well-documented public health crisis where enhanced understanding of public perceptions could directly contribute to increased levels of bystander interventions and ultimately save lives during cardiac emergencies.

Chapter 2: Literature Review

2.1 Introduction

Out-of-hospital cardiac arrest (OHCA) represents one of the most time-critical medical emergencies, where survival outcomes are highly dependent on the immediacy and quality of bystander intervention. In Ireland, approximately 5,000 individuals experience OHCA annually (National Ambulance Service, 2023a), yet survival rates remain at a concerning 8.4% (National Ambulance Service, 2023a)—significantly below the European Union average of 9.2% and far behind leading countries such as Norway, which achieves 25% survival rates (Barry *et al.*, 2023;National Ambulance Service, 2023). This disparity exists despite the deployment of approximately 9,000 AEDs nationwide (National Ambulance Service, 2015), highlighting a critical disconnect between device availability and effective utilisation.

The fundamental premise underlying this research is that technological solutions alone are insufficient to address public health challenges; rather, the human factors governing technology adoption and utilisation during high-stress emergency situations represent the true determinants of success. This literature review systematically examines the complex interplay between public awareness, confidence levels, and perceived barriers that collectively determine whether life-saving AED technology translates into improved survival outcomes for OHCA victims.

The review establishes three interconnected arguments that form the conceptual foundation for this research. First, public awareness of AED technology, while necessary, is insufficient to drive effective utilisation without corresponding confidence and training. Second, that demographic characteristics—particularly age and educational attainment—systematically influence both awareness levels and confidence in AED use, creating predictable patterns of health inequality. Third, that perceived barriers to AED use operate as complex psychological and social phenomena that require theoretical understanding to address effectively through targeted interventions.

To examine these propositions, this literature review was conducted through systematic searches of major academic databases, including PubMed, ScienceDirect, and Google Scholar, using search terms such as "AED knowledge," "public awareness," "bystander intervention," and "cardiac arrest." Studies were selected based on rigorous inclusion criteria comprising peer-reviewed publications from 2015-2025, robust methodological approaches, and alignment with the research objectives. Quality assessment prioritised studies employing validated survey instruments, adequate sample sizes, and sophisticated statistical analysis techniques.

This review directly supports the study's three primary research objectives: investigating the association between demographic characteristics and AED knowledge; identifying perceived barriers to AED use; and evaluating relationships between awareness levels and demographic factors. By establishing this theoretical foundation, the review provides the conceptual framework necessary to interpret findings and develop evidence-based recommendations for improving Ireland's OHCA response system.

2.2 Automated External Defibrillators: Technology and Regulatory Context

2.2.1 AED Technology and Classification

Automated External Defibrillators represent a critical intersection between advanced medical technology and public health accessibility. These portable devices are designed to analyse cardiac rhythms and deliver electrical shocks to restore normal heart rhythm during sudden cardiac arrest, with effectiveness demonstrated through their ability to increase survival rates from less than 5% to 50-70% when applied within the first 3-5 minutes post-collapse (Faten A AlRadini *et al.*, 2023).

The regulatory classification of AEDs reflects their critical importance in emergency medicine. In Europe, AEDs are classified as class IIb medical devices requiring CE approval marks, indicating compliance with the European Union (EU) Medical Devices Directive (93/42/EEC) and relevant international standards. This classification balances device accessibility with safety requirements, recognising that AEDs must be sophisticated enough to make accurate rhythm analysis decisions while remaining simple enough for untrained bystanders to operate effectively during high-stress emergencies (HIQA, 2024).

The technological design of modern AEDs incorporates several features specifically intended to address user confidence barriers. Voice prompts guide users through each step of the process, visual indicators confirm proper pad placement, and automated rhythm analysis removes the burden of medical decision-making from lay responders. Despite these user-friendly design elements, research consistently demonstrates that technology design alone cannot overcome the psychological and social barriers that prevent effective utilisation during actual emergencies.

2.2.2 Strategic Deployment and Accessibility

The strategic placement of AEDs represents a complex optimisation challenge balancing cost-effectiveness, accessibility, and community coverage. International evidence suggests that AED deployment should prioritise locations with high cardiac arrest incidence, adequate population density to ensure cost-effectiveness, and 24-hour accessibility to maximise potential impact (HIQA, 2024).

However, deployment strategies frequently fail to consider the human factors that determine actual utilisation. Research by Huang *et al.* (2024) revealed that only 20.5% of individuals know the location of an AED near their home, with even lower awareness near public transport (14.9%) and workplaces (34.2%). This awareness gap represents a fundamental system failure where strategic placement becomes irrelevant if potential users cannot locate devices during emergencies.

The evolution toward external wall-mounted cabinets reflects growing recognition that accessibility must extend beyond business hours. Traditional internal placement within buildings severely limits access during evenings and weekends when many cardiac arrests occur. Climate-controlled external cabinets address operational requirements while ensuring continuous availability, though concerns about theft and vandalism persist despite minimal evidence of such incidents occurring in practice.

2.3 Public Awareness and Knowledge: The Foundation of Effective Utilisation

Public awareness of AED technology forms the foundational layer upon which all subsequent intervention decisions rest. Without basic awareness of device existence, purpose, and accessibility, even the most sophisticated deployment strategies remain ineffective. Research evidence reveals a complex relationship between different dimensions of awareness, highlighting the distinction between passive recognition and actionable knowledge.

Studies demonstrate considerable variation in awareness levels across different populations and geographic regions. Ryan *et al.* (2021)found that while 98.6% of participants in Cork GAA clubs had heard of defibrillators, only 64% were familiar with the term "AED," and fewer than half could correctly identify the abbreviation's meaning. This finding illustrates a critical gap between general awareness and specific operational knowledge necessary for emergency intervention.

The relationship between awareness and confidence represents a particularly concerning aspect of current public preparedness. Prior to targeted training, only 4.9% of participants expressed confidence in accessing an AED, despite high levels of general awareness (Ryan *et al.*, 2021). This confidence gap suggests that awareness campaigns

focusing solely on device recognition may be insufficient to generate effective emergency response behaviour.

International comparisons reveal similar patterns across diverse cultural contexts. Huang *et al.* (2024) Huang et al. (2024) found that confidence in recognising AEDs was 4.5 times more likely to correlate with knowledge of AED locations, indicating that effective awareness programmes must integrate device recognition with location familiarity. This finding suggests that static awareness campaigns may be less effective than dynamic approaches that help individuals develop spatial knowledge of their local emergency response infrastructure.

The temporal dimension of awareness retention represents another critical consideration. Research indicates that knowledge acquisition without regular reinforcement leads to rapid decay in both technical skills and confidence levels. This pattern has important implications for the design of sustainable public education programmes, suggesting that one-time training interventions may be insufficient to maintain community preparedness over time.

Furthermore, the research reveals concerning gaps between theoretical knowledge and practical application. Gonzalez *et al.* (2015) identified a substantial disconnect where 66% of respondents could correctly identify an AED and its purpose, and 58% reported willingness to use one, yet less than 10% spontaneously mentioned AED use when presented with hypothetical cardiac arrest scenarios. This "knowledge-action gap" represents a fundamental challenge that cannot be addressed through traditional information-transfer approaches alone.

2.4 Confidence and Willingness: Psychological Foundations of Emergency Response

2.4.1 The Role of Training in Building Confidence

The relationship between training exposure and AED utilisation confidence represents one of the most robust findings in the literature. Many studies have demonstrated that educational interventions produce measurable improvements in both technical competence and psychological readiness to intervene during cardiac emergencies.

Hunt *et al.* (2023) and Kono *et al.* (2024) both identified that participants with exposure to first aid or AED training demonstrated significantly elevated confidence levels compared to untrained individuals. This relationship was quantified by AlRadini *et al.*, (2023), who found that BLS/CPR trained individuals demonstrated 2.5 times greater understanding and willingness to use AEDs compared to their untrained counterparts. The magnitude of this effect suggests that training interventions address not only technical knowledge deficits but also fundamental psychological barriers to emergency intervention.

The quality and frequency of training appear to be critical determinants of long-term effectiveness. Daud *et al.*(2023) identified through a systematic review that receiving CPR education on four or more occasions was associated with increased willingness to perform CPR and use AEDs. Additionally, recent training (within the previous five years) emerged as a significant positive predictor of intervention willingness, supporting the need for regular refresher programmes rather than one-time educational events.

Chen *et al.* (2024) demonstrated that participation in AED-related training significantly influenced both knowledge acquisition and willingness to use public AEDs ($P < .05$). However, the research also revealed that even among trained participants, substantial barriers persist, including concerns about accidentally harming victims (14.3%) and inadequate specific AED instruction (18.4%) (Faten A AlRadini *et al.*, 2023). These findings suggest that training programmes must address not only technical competencies but also the psychological aspects of emergency decision-making.

2.4.2 Theoretical Frameworks for Understanding Emergency Behaviour

The complexity of emergency response behaviour necessitates sophisticated theoretical frameworks that can account for the multiple factors influencing bystander decision-making during cardiac arrest situations. Several established health behaviour models provide valuable insights into these processes.

The Theory of Planned Behaviour (TPB) (Ajzen, 1991) offers essential insights for understanding how knowledge translates to intended behaviour. Tam and Kwok (2024) demonstrated that TPB-based community education programmes could effectively bridge the "know-do" gap and enhance willingness to perform CPR and use AEDs. Their research identified that attitude, subjective norm, and perceived behavioural control

were all positively associated with AED utilisation willingness (all OR_adj >1.5, p<0.001). This evidence suggests that effective interventions must address not only individual knowledge and skills but also social norms and perceived control over emergencies.

The Health Belief Model (HBM) by Rosenstock (1974) provides additional insights into how demographic factors influence health-related behaviours through their effects on perceived susceptibility, severity, benefits, and barriers. This model is particularly relevant for understanding how age and educational background might systematically influence AED utilisation through their effects on health-related perceptions and self-efficacy beliefs.

Bandura's (1986) Social Cognitive Theory (SCT) offers crucial insights into the role of self-efficacy in emergency response behaviour. The theory's emphasis on observational learning and the reciprocal interaction between personal characteristics, environmental factors, and behaviour provides a framework for understanding how demographic variables might influence confidence development and emergency response capabilities.

2.4.3 The Bystander Effect in Cardiac Emergency Contexts

The bystander effect represents a well-established psychological phenomenon with profound implications for emergency response effectiveness. Research by Kono *et al*. (2024) has provided important empirical evidence showing how this effect specifically impacts AED utilisation during cardiac emergencies.

The study revealed that bystander willingness to assist declined significantly as interventions became more technically complex and consequential. While 84.2% of respondents expressed willingness to call for help during a cardiac emergency, only 30.7% were willing to initiate rescue efforts through AED use. This dramatic decline suggests that the technical and responsibility aspects of AED use create unique psychological barriers not present in simpler interventions.

Importantly, the research found that the presence of perceived competent parties (such as security personnel or station staff) reduced bystander willingness to intervene, regardless of the total number of bystanders present. This finding has significant implications for AED deployment strategies and training programmes, suggesting that

interventions must address social dynamics and shared responsibility rather than focusing solely on individual competence.

The theoretical framework of bystander intervention (Latané and Darley, 1970) provides a structured approach to understanding these phenomena. The five-stage decision-making process—noticing the emergency, interpreting it as requiring intervention, accepting personal responsibility, possessing necessary skills, and implementing the response—offers a systematic framework for identifying specific intervention points where educational programmes can be most effective.

2.5 Barriers to AED Utilisation: A Multi-Dimensional Analysis

2.5.1 Knowledge and Competence Barriers

Knowledge deficits represent the most fundamental barrier category, serving as the foundation upon which other barriers develop and persist. International research consistently identifies inadequate AED knowledge as the primary obstacle to effective utilisation across diverse populations and healthcare systems.

Quantitative evidence from multiple studies reveals the scope of this challenge. Chen *et al.* (2024) found that only 12.7% of surveyed adults demonstrated adequate AED operational knowledge, while Huang *et al.* (2024) identified that merely 5.3% of participants expressed confidence in AED use. These findings are validated by Wang *et al.* (2022) Wang et al. (2022) found that 44.19% of respondents possessed inadequate knowledge of resuscitation techniques, and research in Saudi Arabia revealed that 65.8% of respondents had no first aid training and 85.3% lacked AED training AlRadini *et al.* (2023).

The Irish context presents similar challenges despite ongoing educational initiatives. (Ryan *et al.* (2021) identified substantial knowledge deficits among sports club members prior to targeted training interventions. While post-training results demonstrated significant improvement (over 93% accuracy in AED pad placement identification), the initial knowledge gaps highlight the magnitude of educational challenges facing public health authorities.

These knowledge deficits create a vulnerability cascade where bystanders lacking operational understanding become susceptible to psychological barriers, including performance anxiety, fear of causing harm, and reluctance to intervene during critical timeframes. The interconnected nature of these barriers suggests that effective interventions must address multiple dimensions simultaneously rather than focusing on isolated knowledge transfer.

2.5.2 Psychological and Legal Liability Concerns

Psychological barriers represent complex phenomena that extend beyond simple knowledge deficits to encompass fears, anxieties, and risk perceptions that can paralyse bystanders during emergencies. Research by Chen *et al.* (2024) identified that among individuals unwilling to perform defibrillation, the highest percentages cited "fear of incorrect use" (31.2%) and "fear of harming the patient" (29.3%) as primary deterrents.

Legal liability concerns persist as significant barriers despite the presence of Good Samaritan legislation designed to protect emergency responders. Huang *et al.* (2024) found that less than 3% of participants understood the meaning of Good Samaritan Laws, indicating that legal protection mechanisms remain ineffective when unknown to the public. This knowledge gap transforms potential life-savers into reluctant bystanders, demonstrating how information deficits can neutralise well-intentioned policy interventions.

The temporal pressure inherent in cardiac emergencies creates a unique psychological environment that can overwhelm bystanders' decision-making capabilities. Research indicates that while public education campaigns successfully communicate the importance of rapid intervention (within 3-5 minutes for optimal outcomes), this time pressure paradoxically increases rather than decreases psychological barriers for many potential responders.

2.5.3 Access and Infrastructure Barriers

Physical accessibility represents a persistent challenge that undermines even well-designed AED deployment strategies. Yonis *et al.* (2024) discovered that only 19.2% of research participants could locate their nearest AED, while many deployed devices were housed in buildings with limited access hours. This accessibility gap is compounded by

inadequate signage, poor storage locations, and maintenance issues that render devices unreliable during emergencies.

The evolution toward external wall-mounted cabinets represents recognition of these accessibility challenges, though implementation remains inconsistent across regions. Climate-controlled external storage addresses operational requirements while ensuring 24-hour availability, yet concerns about cost, theft, and vandalism continue to influence deployment decisions despite minimal evidence of such problems in practice.

2.5.4 Regional and Demographic Disparities

Regional variations in OHCA outcomes reflect complex interactions between infrastructure, culture, and healthcare system factors. Shannon (2019) identified that while 71% of OHCAs occurred in urban locations, rural areas demonstrated significantly higher pre-hospital resuscitation attempt rates of 82%. This paradoxical finding suggests that population density and infrastructure advantages do not automatically translate to improved bystander intervention rates.

Barry *et al.* (2024) found that AED utilisation is paradoxically less likely in urban areas despite theoretically superior infrastructure. This counterintuitive pattern can be attributed to several factors: urban AEDs are frequently housed within secured buildings, complex urban layouts create navigation challenges, and urban populations may develop psychological dependence on professional emergency services due to their perceived proximity and reliability.

The implications of these regional disparities extend beyond simple geographic differences to encompass fundamental questions about healthcare equity and resource allocation. Rural communities, while demonstrating stronger intervention cultures, face longer emergency response times that make immediate AED access most critical. Conversely, urban areas possess superior infrastructure but demonstrate lower intervention rates despite greater need density.

2.6 International Perspectives: Lessons from Global AED Implementation

2.6.1 Legislative Frameworks and Policy Approaches

International comparison reveals significant variation in regulatory approaches to AED deployment and utilisation. The United States leads with comprehensive federal guidance established through the Cardiac Arrest Survival Act of 2000, addressing strategic placement, training requirements, maintenance protocols, emergency medical services coordination, and legal liability protection. This comprehensive approach has contributed to survival rates of approximately 11%, though significant regional disparities persist.

European approaches demonstrate diverse regulatory strategies. France has proposed comprehensive mandates requiring AED installation in all public-access establishments with integrated national location databases. Portugal established its legal framework in 2009, authorising trained laypersons to operate AEDs, subsequently expanding requirements to critical infrastructure, including airports, commercial centres, and transportation terminals. Canada employs targeted provincial approaches, such as Manitoba's Defibrillator Public Access Act, which mandates registration with the Heart and Stroke Foundation to enable real-time location access for emergency dispatchers.

Ireland's Public Health (Availability of Defibrillators) Bill 2013 requires AED installation across approximately 43,000 premises, including hospitals, shops, churches, public buildings, pubs, and sports clubs. However, this framework adopts a broader sectoral approach compared to more targeted international models, potentially lacking the specificity and enforcement mechanisms demonstrated in more successful programmes.

2.6.2 Survival Outcomes and System Performance

International evidence demonstrates dramatic potential for improvement through systematic AED implementation. The Netherlands provides compelling evidence of achievable progress, with research by Blom *et al.* (2014) documenting increased survival rates from 29.1% to 41.4% for patients presenting with shockable initial rhythms over six

years. This improvement was directly attributed to increased AED utilisation, which rose from 21.4% to 59.3%, reducing the critical time from emergency call to defibrillation-device connection from 9.9 to 8.0 minutes.

These outcomes contrast sharply with Ireland's current performance, where survival rates of 8% lag significantly behind both European averages (9.2%) and leading international examples such as Norway (25%). The gap between current performance and demonstrated potential suggests that system-level factors, rather than demographic or cultural characteristics, represent the primary determinants of success.

Norway's achievement of 25% survival rates demonstrates the potential for exceptional outcomes through comprehensive system integration. Their success stems from strong public awareness campaigns, systematic integration of CPR protocols into emergency medical services, mandatory school training programmes, and cultural normalisation of bystander intervention during emergencies.

2.7 Theoretical Integration: Toward a Comprehensive Understanding

The literature reveals that no single theoretical perspective adequately captures the complex, multifaceted nature of public AED usage decisions. This recognition has led to the development of integrated frameworks that synthesise insights from multiple theoretical traditions.

The Technology Acceptance Model (Davis, 1989) offers a useful framework for insights into how perceived usefulness and ease of use influence technology adoption, though its applicability to emergency-specific technologies presents unique challenges. Unlike routine technologies that individuals choose to adopt, AEDs must be accepted and utilised under extreme stress conditions with life-or-death consequences.

The Health Belief Model by Rosenstock (1974) offers valuable insights into how demographic factors influence health-related behaviours through their effects on perceived susceptibility, severity, benefits, and barriers. This model is particularly relevant for understanding how age and educational background might systematically influence AED acceptance and utilisation patterns.

The Theory of Planned Behaviour has demonstrated particular utility in AED research contexts. Tam and Kwok (2024) successfully employed TPB frameworks to enhance community willingness to perform CPR and use AEDs, with attitude, subjective norm, and perceived behavioural control all emerging as significant predictors of utilisation intentions.

Building upon these established frameworks, this research employs an integrated theoretical model that synthesises technology acceptance, health behaviour, and social cognitive perspectives to create a comprehensive framework specifically designed for understanding public AED utilisation decisions within the Irish cultural and healthcare context.

2.8 Research Gaps and Study Rationale

The literature review reveals several critical knowledge gaps that this research addresses. First, while international studies provide valuable insights into AED utilisation patterns, limited recent research has specifically examined public perceptions within the Irish context, particularly following recent policy initiatives such as VAT removal and enhanced deployment programmes.

Second, the relationship between demographic characteristics and AED awareness/confidence levels remains inadequately understood, despite evidence suggesting systematic patterns of variation. Understanding these relationships is essential for developing targeted interventions that address health inequalities and ensure equitable access to life-saving interventions.

Third, the complex interplay between awareness, confidence, and perceived barriers requires empirical investigation within the Irish healthcare and cultural context. While international research provides theoretical foundations, cultural, legal, and healthcare system differences necessitate context-specific investigation to inform effective policy development.

Finally, the literature reveals insufficient understanding of how recent technological and policy developments have influenced public perceptions and utilisation patterns. This research addresses this gap by examining current awareness levels, confidence patterns,

and barrier perceptions in 2025, providing contemporary evidence to guide future interventions.

2.9 Conclusion

This literature review establishes that effective AED utilisation represents a complex socio-technical challenge requiring coordinated attention to technological, educational, psychological, and systemic factors. The evidence identifies that device deployment alone is insufficient to improve OHCA survival outcomes; rather, success depends on creating integrated systems that address human factors alongside technological capabilities.

The research reveals three critical insights that inform this study's approach. First, awareness and confidence represent distinct but interconnected dimensions of public preparedness, with demographic factors systematically influencing both dimensions through their effects on technology exposure, health knowledge, and self-efficacy beliefs. Second, perceived barriers to AED use operate as complex psychological and social phenomena requiring theoretical understanding and targeted intervention rather than simple information transfer. Third, successful AED programmes require comprehensive approaches that integrate device deployment, public education, legal framework development, and emergency service coordination within culturally appropriate implementation strategies.

The international evidence provides compelling proof of concept for dramatic improvement potential. The Netherlands' achievement of nearly tripled AED utilisation rates with corresponding survival improvements demonstrates that systematic interventions can produce measurable outcomes within relatively short timeframes. Norway's exceptional survival rates demonstrate the potential for outstanding results through comprehensive system integration and cultural normalisation of bystander intervention.

For Ireland, the evidence suggests that current underperformance relative to European averages represents an opportunity rather than an insurmountable challenge. The foundation exists through established deployment programmes, growing training initiatives, and supportive policy developments. However, realising this potential requires

evidence-based understanding of current public perceptions, confidence levels, and barrier experiences to inform targeted interventions.

This research contributes to addressing identified knowledge gaps by examining the contemporary landscape of public AED perceptions across Ireland in 2025. By investigating the relationships between demographic characteristics and awareness/confidence levels, identifying current perceived barriers, and evaluating the effectiveness of recent initiatives, this study provides empirical evidence to guide the development of more effective AED utilisation programmes.

The ultimate goal extends beyond academic understanding to practical impact: creating evidence-based recommendations that can inform policy development, training programme design, and deployment strategies to transform Ireland's OHCA response system. The literature demonstrates that such transformation is both necessary and achievable, requiring only the coordinated application of evidence-based interventions informed by a robust understanding of public perceptions and barriers to effective AED utilisation.

Chapter 3: Research Methodology

3.1. Overview

Building upon the comprehensive literature review examined in Chapter 2, this chapter establishes a methodological framework strategically designed to address the research questions articulated in Chapter 1.

Substantial barriers to AED utilisation emerged upon critical analysis of existing relevant literature, primarily originating from low bystander confidence and public awareness level inadequacies. These findings emphasise the necessity for a methodological approach capable of capturing both the breadth and depth of factors influencing emergency response behaviours.

To understand the complex interplay between public knowledge, confidence levels, accessibility concerns, and behavioural intentions, a comprehensive research design is essential. The study adopts an integrated approach combining primarily quantitative data

collection methods alongside qualitative exploration. This mixed-methods design facilitates a nuanced understanding of the factors shaping emergency response behaviours. As Bell *et al*. (2019) emphasise that "mixed methods research provides a more complete understanding of research problems than either approach alone" (p. 629).

This chapter systematically advances through each key stage of the methodology employed. Initially, it establishes the philosophical foundations supporting the research approach. Following this, the justification for the mixed-methods design will be presented, along with descriptions of the quantitative and qualitative data collection strategies. Additionally, this chapter will also detail the sampling procedures, outline the analytical frameworks, and address the ethical considerations.

The methodological approach delineated in this chapter acts as a bridge between the theoretical foundations and behaviour models established in earlier chapters and the empirical findings to be addressed in the subsequent chapters. It takes into account the unique contextual factors shaping emergency response behaviours in Ireland, while ensuring methodological rigour and alignment with the overarching research objectives of this study.

3.2. Scope of the Research

This research encompasses a comprehensive examination of the barriers and facilitators influencing the utilisation of Automated External Defibrillators (AEDs) within the designated research context. This study employs a systematic methodological framework to evaluate the multifaceted factors that either hinder or improve AED awareness, confidence and utilisation.

The research parameters are delineated by specific respondent selection criteria, to include English-speaking adults aged eighteen years and above residing throughout Ireland, encompassing both the Republic of Ireland and Northern Ireland, thereby establishing clear demographic and geographic boundaries for respondent recruitment and data collection procedures. These boundaries facilitate methodological consistency

while maintaining relevance to the broader Irish healthcare landscape and emergency response infrastructure nationally.

The investigative framework employs a dual-method analytical approach by integrating both quantitative and qualitative methodologies to systematically identify, classify, and evaluate the diverse organisational, environmental, and psychosocial variables that impede effective AED utilisation. Denscombe, (2014) notes that "the mixed methods approach recognises that there are advantages to be gained from using both quantitative and qualitative methods within a single piece of research" (p. 153). Concurrently, the study examines enabling factors that facilitate successful AED utilisation, thereby developing a comprehensive classification of key influencing elements and their cumulative impact on utilisation outcomes.

The scope further extends to examining the interplay between these identified factors and their cumulative impact on utilisation outcomes, thereby providing a holistic understanding of the AED utilisation landscape across Ireland under the specified research parameters.

This research study aimed to investigate the following:

1. The association between the public demographics (e.g. age, education level, etc.) and their knowledge of AEDs.
2. The perceived barriers to AED use, in comparison with the level of understanding of AEDs.
3. The relationship between awareness levels amongst the public and their demographic responses.

3.3. Philosophical Approach

The philosophical approach applicable to this research is Pragmatism. Rahi (2017) emphasises that "research paradigms guide the entire research process and methodology selection" (p. 403). The pragmatic stance is the most fitting approach from both a methodological and epistemological perspective. This paradigmatic selection emphasises the practical implications of research findings and the utility of employing

multiple methodological approaches to comprehensively address complex research questions (Creswell and Clark, 2007). This paradigmatic choice also reflects a conscious philosophical stance that directly addresses the complex and multidimensional nature of public health behaviour and decision-making during cardiac emergencies.

The study employs both pragmatic and abductive reasoning approaches, moving iteratively between inductive pattern recognition and deductive hypothesis testing. This methodological integration reflects the pragmatic paradigm's emphasis on practical utility while acknowledging the complex, context-dependent nature of emergency response behaviours. The abductive approach enables systematic identification of underlying phenomena that explain observed AED utilisation patterns, particularly useful for understanding the substantial knowledge-action gaps identified in preliminary literature.

The epistemological basis of pragmatism, which is focused on building knowledge through practical experience and contextual application, aligns closely with the nature of AED utilisation research. Rahi (2017) notes that "epistemology examines the nature of knowledge and acceptable ways of inquiry" (p. 403). Unlike the interpretivist paradigms, which primarily focus on subjective meaning-making or positivist approaches, which assume there is one fixed reality existing independently of opinions or perspectives, discoverable through controlled measurement. Whereas pragmatism recognises that understanding public behaviour towards AED utility requires acknowledging both measurable patterns of awareness and confidence levels, accompanied by the profoundly contextual and culturally-embedded factors that impact the emergency response decisions.

This research philosophy is particularly suited to this study because the public perceptions of medical emergency interventions exist between the objective knowledge and subjective interpretation. For this study, the objective knowledge refers to the technical AED operation and medical effectiveness. While the subjective interpretation of the bystanders includes fear, confidence and cultural attitudes relating to the medical intervention. Pragmatism also accepts that knowledge can be both discovered and created, allowing the investigation of awareness levels while simultaneously exploring how experiences, cultural contexts, and social influences form the perceptions of

bystanders towards AED use. Additionally, the focus on temporal future outcomes, opposed to the certainties of the past, corresponds to the emergency nature associated with AED utilisation scenarios. Similarly, the focus on practical outcomes and actionable knowledge is highly relevant as public confidence in using AEDs is not about knowledge of abstract facts but more about being able to act effectively under pressure.

The pragmatic approach is essential for addressing the knowledge-action gap phenomenon, which emerged as a central finding requiring methodological approaches capable of examining both theoretical understanding and practical implementation barriers simultaneously. This philosophical positioning enables the study to prioritise clinical significance alongside statistical significance, reflecting pragmatism's emphasis on real-world impact over academic convention alone.

Likewise, from the ontological point of view, the pragmatic approach is essential for this study as its identification of multiple contextually-dependent realities is particularly fitting for AED utilisation research. The public perceptions of AED use exist across various reality constructions. These include the physiological reality of the sudden cardiac arrest condition, the technological reality of AED device functionality, the psychological reality of bystander intervention, and the social reality of community emergency preparedness expectations. Instead of favouring just one view of reality, pragmatism’s approach identifies that understanding how AEDs are used requires engaging with multiple overlapping and interconnected ways of seeing the world. This paradigm justifies integrating both the quantitative approach using measurements of awareness across demographic groups with qualitative exploration by understanding the survey respondents’ decision-making processes. This reflects the pragmatism's primary focus to examining phenomena from multiple perspectives.

The conceptual framework developed in Chapter 2, integrates the Theory of Planned Behaviour with contextual emergency response models, aligns precisely with pragmatism's multi-perspectival approach. The framework's focus on modifiable variables (knowledge, attitudes, perceived behavioural control) alongside stable background factors (demographics, personality traits) reflects pragmatism's practical orientation toward identifying actionable intervention points. This philosophical stance supports the framework's distinction between perceived barriers as distinct variables

that intervention programmes can address, rather than only noting their existence, enabling the development of targeted interventions that address the most impactful obstacles to AED utilisation (Dewey, 1931; Hickman, 1990).

In terms of the axiological stance, pragmatism acknowledges that research is inherently value-driven and should be focused towards practical problem-solving, which aligns with the frameworks' emphasis on finding factors that can be changed to improve intervention design (Cherryholmes, 1992;Tashakkori and Teddlie, 2010). The frameworks distinguish between background factors (like stable demographic or personality traits) and mediating variables (which can be changed through training, education, or policy), which reflect pragmatism's value-driven focus on producing knowledge that can improve public health outcomes (Antonio, 2025;Morgan, 2014).

3.4. Research Design

This study employs a sequential mixed-methods research design while integrating pragmatic philosophical foundations with methodological choices to connect the paradigm to the analytical techniques. As Rahi (2017) states that "research design provides the framework for data collection and analysis procedures" (p. 403). The mixed methods design consists of a primarily quantitative component to comprehensively examine public perceptions and utilisation patterns of Automated External Defibrillators (AEDs) nationally. Bell *et al.*, (2019)argue that "the research design provides a framework for the collection and analysis of data" and emphasise that "it reflects decisions about the priority being given to a range of dimensions of the research process" (p. 40). The survey design carefully and strategically integrated both methodological approaches to maximise their combined effectiveness within the study, as recommended by Bell *et al.*, (2019).

This pragmatic paradigm facilitates mixed-methods inquiry by acknowledging that complex phenomena, such as emergency response behaviours, require multiple analytical perspectives. This recognition logically leads to the adoption of a cross-sectional survey methodology to capture both quantifiable patterns and contextual understanding.

The research design explicitly incorporates intersectionality theory principles, recognising that demographic characteristics (age, educational attainment, geographic location, occupation) interact in complex multiplicative rather than simply additive ways to influence AED preparedness patterns. This theoretical positioning acknowledges that understanding emergency response capability requires examination of how multiple social identities and structural positions combine to create unique patterns of advantage and disadvantage.

The research conducted in this study uses a cross-sectional survey methodology to collect data from a demographically representative sample of Irish adults (n=385) using a 95% confidence interval (CI) and a margin of error of 5 in the sample size calculation based on the Irish population. Forza, (2002) emphasises that "survey research is particularly suited to answering questions about what, how much, and how many" and notes that "cross-sectional surveys provide a snapshot of variables of interest at a single point in time" (p. 155). The survey respondent sample is stratified by age, gender, geographic location, and educational qualification attainment to achieve informed and varying factors representative of the sub-section of the current Irish population surveyed. Data collection was conducted using both hard copy questionnaires and electronic links to the survey questionnaire to maximise accessibility and response rates across diverse demographic groups while minimising selection bias.

The survey instrument consists of 34 questions total, 32 closed-ended quantitative questions incorporating ordinal data, some binary questions and Likert scale questions. These questions are designed to measure the AED awareness levels, confidence in device operation, perceived barriers to usage, and demographic variables highlighted in the literature review as potentially influential. The quantitative component employs a comprehensive scoring system incorporating correct responses across technical questions about AED purpose, paediatric use, electrode placement, and operational factors.

Simultaneously, the survey questionnaire encompassed 2 primary open-ended qualitative questions accompanied by several optional elaboration opportunities throughout the survey. These qualitative questions facilitate the survey respondents to provide contextual insights and elaborate on their experiences and perceptions regarding

AED accessibility and usage. By embedding these qualitative elements, the study minimises respondent burden while enabling those willing to share deeper insights through personal experiences and perspectives, reflecting the pragmatic approach's emphasis on practical feasibility alongside methodological rigor. Denscombe, (2014) observes that "mixed methods research can overcome the limitations that stem from using just one method" and allows researchers to "get a more complete picture of the thing being investigated" (p. 154). This mixed-methods approach provides statistical generalisability through the quantitative data derived from the closed questions while simultaneously capturing nuanced insights and contextual comprehension through the qualitative responses from the open-ended questions.

The research design is visually represented by the research onion, as conceptualised by Saunders *et al.*, (2019). Consisting of six concentric layers requiring systematic access from the outer lay towards the inner layers. The outer philosophical layer (pragmatism) informs the approach layer (abductive reasoning, which oscillates between inductive pattern identification and deductive hypothesis testing). This, in turn, shapes the methodological choice layer (mixed-methods), leading to the strategy layer (cross-sectional survey with embedded qualitative elements), the time horizon layer (cross-sectional data collection), and finally, the data collection and analysis techniques layer (descriptive statistics, chi-square tests, correlation analysis, Cohen's effect size calculations, confidence interval estimation, odds ratio analysis and thematic analysis). Each layer will be explored in greater detail within this chapter and represented in a study-specific research onion below. (Figure 4)

The analytical process begins with comprehensive data cleaning and validation procedures to ensure response quality and completeness, with responses retained for questions achieving approximately 80% completion to minimise bias and improve generalisability. The integration of electronic and hard copy responses requires careful attention to potential mode effects, though preliminary analysis suggests no systematic differences in response patterns between administration methods.

A thematic analysis will be applied to the data for keyword identification. This will facilitate the identification of common themes and patterns emerging, which could aid in

AED public perceptions, further providing information for future training programmes or further government initiatives.

The integration of quantitative prevalence data with qualitative explanations of underlying attitudes and impediments will generate a comprehensive understanding of current public engagement with this life-saving technology, thereby informing evidence-based recommendations for improving AED accessibility and utility rates amongst Irish communities nationally.

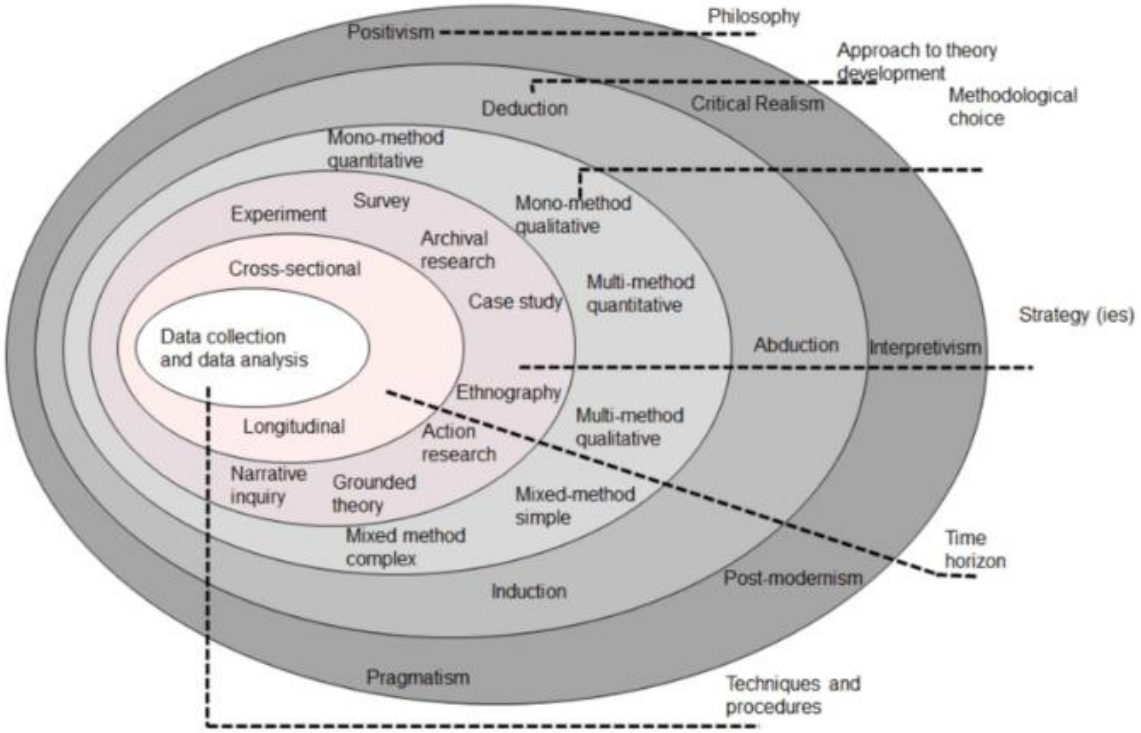
3.5. Research Strategy

A mixed-methods research strategy will be employed to comprehensively examine public perceptions of Automated External Defibrillators (AEDs), combining both quantitative and qualitative questions. This mixed-method approach aims to provide deeper insights into the public understanding, attitudes, and experiences. (Bell *et al.*, (2019) define research strategy as "a general orientation to the conduct of business research" and emphasise that it "provides guidelines about how research should be conducted" (p. 40) The quantitative component will use a structured online survey distributed to a demographically diverse cohort of respondents, incorporating Likert-scale and multiple-choice questions to measure awareness levels, confidence in AED use, perceived barriers to utilisation and demographic correlations of AED attitudes. Complemented by a qualitative survey component featuring open-ended questions, facilitates the exploration of nuanced perspectives.

The research strategy employs a systematic reflexivity framework, explicitly acknowledging how the researcher's positioning as a healthcare professional may influence interpretation of findings, particularly regarding professional knowledge assumptions and training effectiveness patterns. This reflexive awareness enhances analytical transparency while maintaining methodological rigour.

The integration of both methodologies will enable a triangulation of findings. Denscombe (2014) argues that "triangulation involves the use of two or more methods of data collection within a single study" and that "the aim is to get a better and more complete

picture of the thing that is being investigated" (p. 174). The quantitative data will provide statistical generalisability regarding the prevalence of the attitudes and beliefs of the general public. In addition, the qualitative insights will illuminate the contextual factors, the underlying reasons, and the personal experiences that form the public perceptions. This dual approach is particularly valuable for comprehending the complex health technology adoption behaviours, by capturing the measurable indicators of public readiness and the experiential factors which influence individual decision-making in AED application during cardiac emergencies.



Research onion (Saunders et al., 2019, p. 108).

Figure 3: Saunders et al. Research Onion (Seuring et al., 2021)

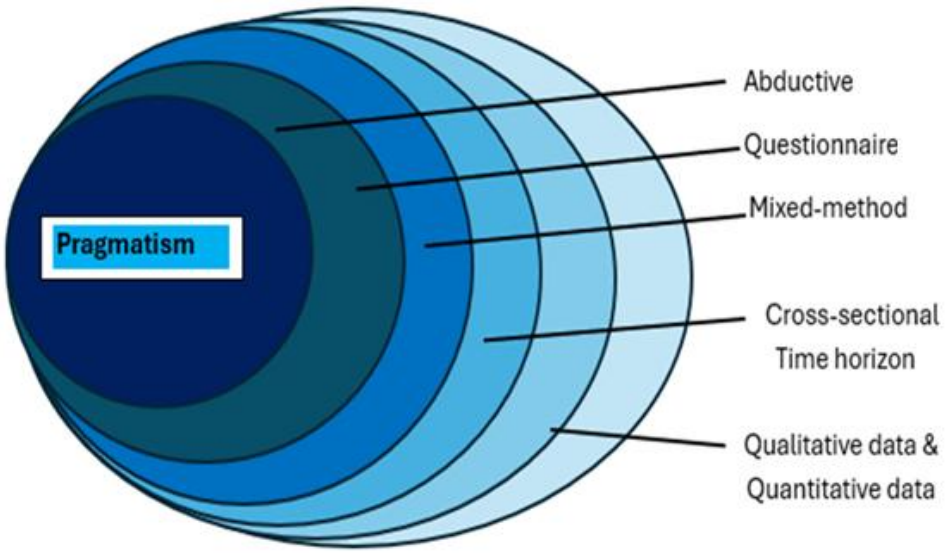


Figure 4: Research Onion for the Present Research *(Author's Own)*

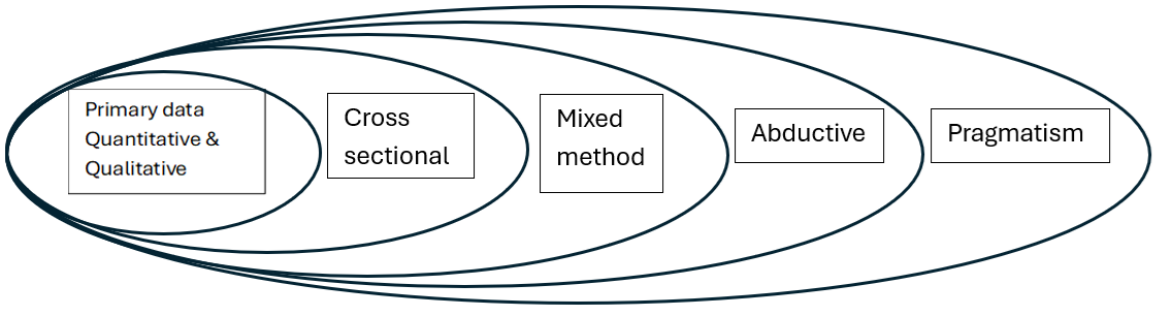


Figure 5: Research Onion for Quantitative survey questions *(Author's Own)*

3.5.1. Data Collection Approach

The research data collection underpinning this study follows a pragmatic mixed-methods approach. This approach strategically combines quantitative measurement with qualitative contextualisation to comprehensively examine public perceptions and utilisation of AEDs in Ireland. Forza (2002) notes that "data collection is probably the most resource-consuming phase of survey research" and emphasises the importance of "systematic procedures to ensure data quality and completeness" (p. 165). The data collection operates on the premise that the quantitative questions are effective in capturing aspects, including public awareness, confidence levels, and perceived barriers across demographic groups. However, this approach in isolation does not reflect the underlying reasons, personal experiences, and contextual factors that shape the public's

attitudes towards AED utilisation in cardiac emergencies. Therefore, the research design deliberately employs two primary open-ended qualitative questions and some minor optional qualitative questions integrated throughout the survey framework. This is to facilitate voluntary elaboration on the respondents' responses and provision of nuanced insights that may be omitted from predetermined quantitative response options alone. The qualitative components also address the survey respondents' underlying reasons, personal experiences, and contextual factors that shape public attitudes towards AED utilisation in cardiac emergencies.

This embedded design logic minimises respondent burden while maximising data richness through the optional nature of qualitative components, ensuring broad participation while facilitating willing respondents to further contribute a deeper contextual understanding via sharing of personal opinions and experiences.

While the abductive analytical approach involves an iterative process alternating between inductive pattern identification from qualitative responses and deductive hypothesis testing of relationships derived from the conceptual framework, allowing for the recognition of both expected patterns and emergent themes which may not have been anticipated in the initial theoretical framework outlined in chapter 2.

Aspect	Deductive Approach	Inductive Approach	Abductive Approach
Hypothesis Testing	Structured surveys with closed-ended questions	Open-ended interviews or surveys with minimal pre-conceived structure	Mixed-method surveys with primarily closed-ended questions and strategic open-ended questions for pattern exploration
Data Analysis	Quantitative techniques (e.g. statistics)	Qualitative techniques (e.g. thematic analysis, grounded theory)	Primarily quantitative analysis with qualitative coding of open-ended responses to identify emergent themes and best explanations
Research Focus	Objective measurement	Theory generation from patterns in data	Pattern recognition and inference to best explanation, using quantitative data as primary evidence with qualitative insights for context

Table 1: Research approaches summarised (Author's Own)

Method	Qualitative	Quantitative
Data Collection	open-ended survey questions	Structured surveys, closed-ended questions
Data Analysis	Thematic analysis	Descriptive analysis

Table 2: Qualitative and quantitative methods summary (Author's Own)

3.5.2. Survey Development and Testing

The research process was implemented using a six-phase systematic sequential design. Beginning with an extensive review of existing literature regarding AEDs to establish a conceptual framework and identify the existing knowledge gaps. Following this, the survey was developed using the Survey Monkey software to develop strategic questions for public perception assessment. Forza (2002) emphasises that "questionnaire development should be guided by theory and previous empirical research" and notes that

"pre-testing is essential to identify potential problems before full-scale data collection begins" (p. 162). The third phase consisted of a pilot of the survey amongst six individuals to obtain feedback. This helped refine the survey and ensure greater clarity and intuitive formatting across the survey design. The fourth stage comprised primary data collection across many facets, including social media platforms, professional networks, public and personal advocacy via poster circulation. The fifth stage focused on data analysis through the exportation of the raw data on the Survey Monkey platform to Excel for statistical analysis. The final phase encompassed the data integration and interpretation by contextualising the quantitative results through the quantitative insights. A triangulation of results was used to develop a comprehensive insight into the public's AED perceptions, experiences, and usage patterns.

3.5.3. Survey Alterations

The original survey design underwent refinement based on feedback from the pilot study respondents (n=6), identifying areas requiring clarification and optimisation. Bell *et al.*, (2019) emphasise that "pilot studies are crucial for identifying potential problems with research instruments" and note that "they can help to refine questions, test procedures, and identify unforeseen difficulties" (p. 289). The language was tailored to suit a lay audience to cater to the entire general public, composed of varying levels of understanding relating to healthcare literacy and medical terminology.

Quantitative questions relating to confidence levels were composed of a consistent 5-point Likert scale throughout the survey to improve statistical comparability. Additionally, the survey branching logic was refined to ensure that respondents who indicated no prior AED knowledge and awareness were appropriately directed past irrelevant confidence-based questions, thereby reducing survey fatigue and improving response quality.

3.5.4. Respondent Recruitment

Respondent recruitment employed a multi-channel approach designed to maximise demographic diversity and representativeness. Following ethical approval, potential

survey respondents were contacted through publicly available channels, including email distribution through professional networks, social media promotion across platforms with different demographic profiles, and community outreach through strategically placed posters containing QR codes linking to the survey.

The recruitment process maintained strict adherence to ethical guidelines, ensuring all contact occurred through publicly available means and that participation remained entirely voluntary. Information provision included a clear explanation of the research purpose, respondent requirements, and data usage, enabling informed decision-making about participation.

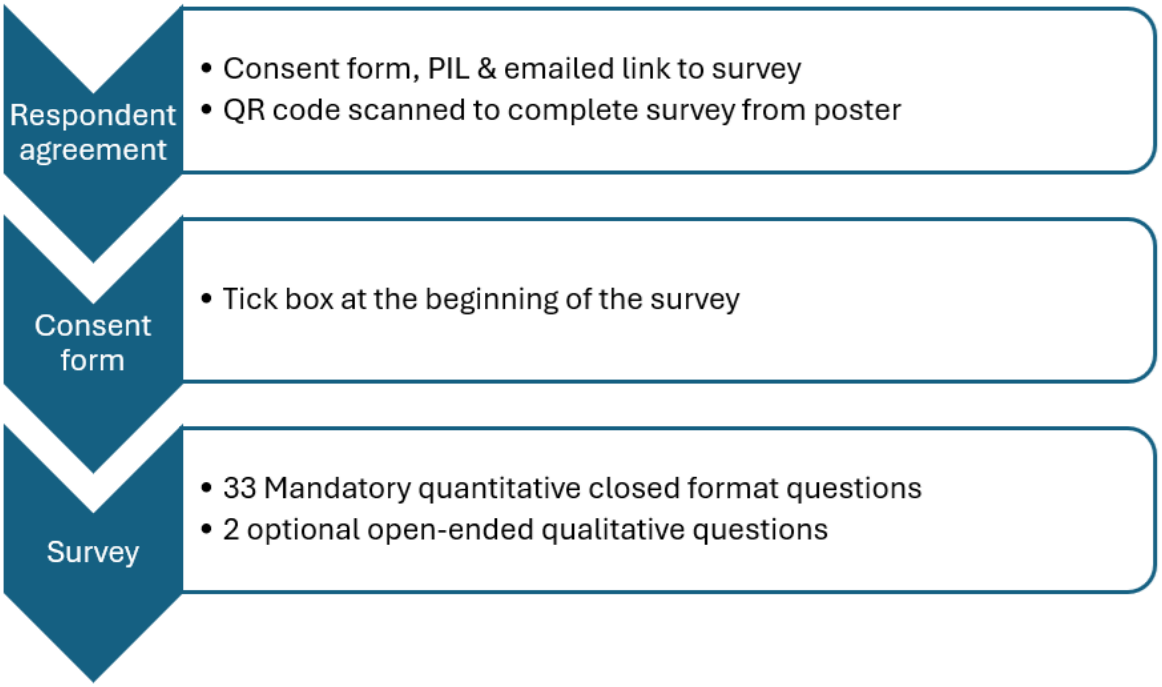


Figure 6: Survey process for respondents *(Author's Own)*

The survey excluded questions on topics that could be considered sensitive, personal, or unnecessary for the study. The questions were directly related to the persons knowledge, awareness, and the barriers to their use of AEDs in emergencies.

3.5.5. Inclusion/Exclusion criteria

Inclusion criteria were established to ensure survey respondent appropriateness while maintaining inclusivity within ethical guidelines. The minimum age requirement of 18 years was established to focus specifically on the adult population, reflecting the legal and practical considerations surrounding emergency response responsibilities and decision-making capacity in emergencies.

No upper age limit was imposed to ensure inclusivity across the adult lifespan, though recruitment strategies acknowledged potential differential technology access across age groups. English language proficiency was required due to survey language constraints, though this limitation was acknowledged as potentially affecting the representation of certain demographic groups within the Irish population.

Geographic inclusion encompassed both the Republic of Ireland and Northern Ireland to capture the full breadth of Irish emergency response contexts, while residency requirements ensured respondents' familiarity with local healthcare systems and emergency response infrastructure relevant to the research questions.

The poster containing the QR code was circulated amongst local communities. This poster is located in Appendix 10.

3.5.6. Sample size and Calculation

The sample size calculation for this study was determined using the adult Irish population at approximately 5,149,139, according to the Central Statistics Office, (2022) census data. To achieve statistically robust findings with adequate precision, a 95% confidence level with a 5% margin of error was selected for examination of public perceptions.

Forza, (2002) states that "sample size determination is one of the most important decisions in survey research" and emphasises that "adequate sample size is necessary to ensure statistical power and generalisability of findings" (p. 158). Applying the formula below, the calculation yielded a minimum required sample size of 385respondents. This sample size provides sufficient statistical power for the quantitative analyses while ensuring comparisons across key demographic variables remain meaningful.

The initial sample size was calculated based on the following widely recognised statistical formula (Cochran, 1977):

$$\text{Sample size} = \frac{\frac{z^2 \times p\,(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p\,(1-p)}{e^2 N}\right)}$$

N = population size • e = Margin of error (percentage in decimal form) • z = z-score

Figure 7: Sample Size Calculation formula (Survey Monkey, 2025a)

Where:

n = Initial Sample Size = 5,149,139

z = 1.96 for Confidence Level Value based on 95% confidence level

p= Population proportion value, most conservative value was selected = 385 (0.5 for maximum variability)

e = Margin of Error = 5

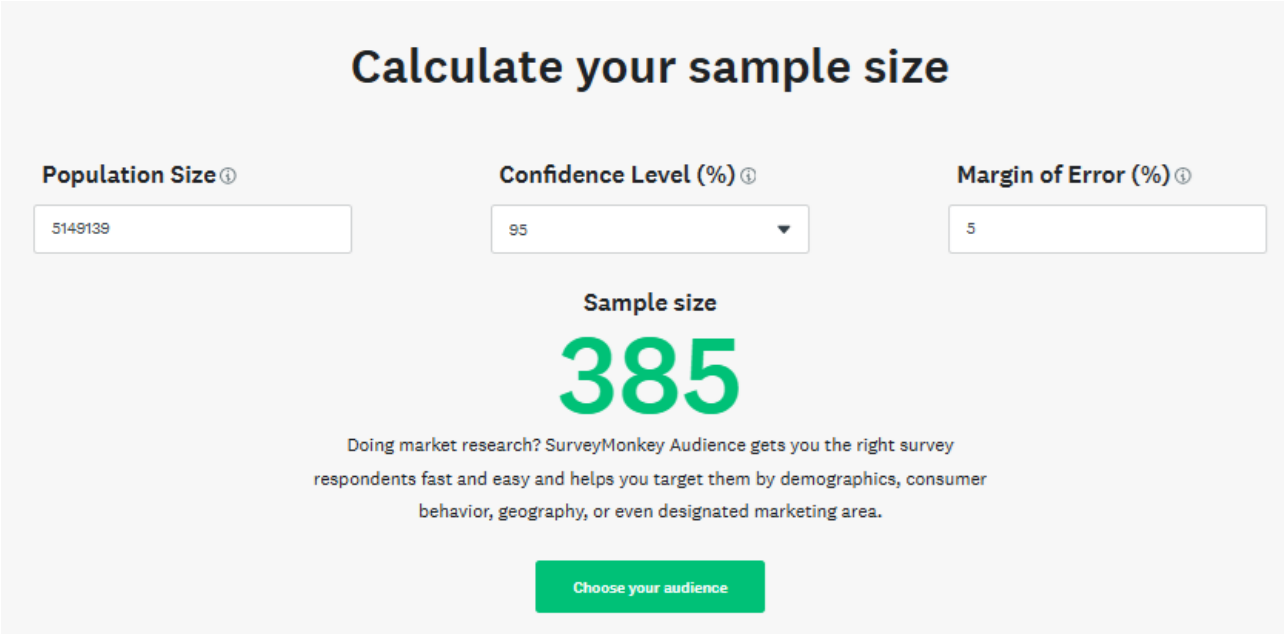


Figure 8: Sample size calculation (Survey Monkey, 2025a) (Central Statistics Office, 2022)

3.5.7. Risks of not hitting the target

An insufficient sample size increases the risk of sampling bias, where certain demographic groups may be over- or under-represented, thereby limiting the external validity and generalisability of findings to the broader Irish adult population. It could also compromise the study's ability to identify statistically significant predictors of AED utilisation behaviours amongst the public.

Additionally, insufficient sample size could limit the ability to conduct meaningful subgroup analyses across demographic categories, reducing the study's capacity to identify differential patterns of awareness, confidence, or barriers across age groups, educational levels, or geographic regions, ultimately limiting the practical applicability of findings for targeted intervention development.

3.6. Time Horizons

This study employs a cross-sectional time horizon, capturing data at a single point in time to understand current knowledge, perceptions, and attitudes towards AED utilisation. This temporal approach aligns with the research objectives of establishing a baseline

understanding of public perceptions and identifying current barriers to AED utilisation across the Irish population.

The cross-sectional design proves appropriate for this investigation as it provides a comprehensive snapshot of public perceptions at a specific temporal point, enabling identification of patterns and relationships that exist at the time of data collection. Denscombe (2014) notes that "cross-sectional designs involve the collection of data on more than one case at a single point in time" and are particularly useful for "describing the incidence, frequency and distribution of certain phenomena" (p. 60). Data collection occurred between June and July 2025, providing contemporary insights relevant to current policy and practice development.

While longitudinal approaches might provide insights into changing perceptions over time, the cross-sectional approach enables efficient resource utilisation while addressing the immediate research questions. Future research could employ longitudinal designs to evaluate the effectiveness of interventions developed from these baseline findings.

3.7. Ethical Considerations

3.7.1. Ethics approval

The research will be ethically approved and accepted by the researcher's supervisor and Griffith College Innopharma ethics committee before initiating contact with potential respondents. This dual approval process provides additional safeguards for both survey respondent welfare and research integrity. Bell *et al.*, (2019) emphasise that "ethical considerations should permeate all aspects of the research process" and note that "researchers have responsibilities to participants, sponsors, and the wider research community" (p. 128). The completed Ethics Application form will be submitted before beginning the study and is attached as an appendix (Appendix 3). The survey questions will be approved by the dissertation supervisor and sent for final approval to the Griffith College Innopharma ethics committee.

Aside from the five demographic questions, the survey will not contain questions requiring any personal details from the respondents and will not contain any personally identifying questions. All responses will be treated with the strictest confidentiality and will not be made available to anyone apart from the researcher, supervisor, and Griffith College staff. The survey participation will be voluntary. Respondents will be entitled to withdraw their consent at any time before or after the surveys. It is therefore possible to conclude that the data collection process will raise no ethical issues.

Several ethical considerations will be made to ensure informed consent will be obtained and no sensitive data will be collected. Each research respondent will be required to provide voluntary and informed consent before commencing the questionnaire by ticking all four options of a tick-box question. The questionnaire will be accompanied by an introductory paragraph explaining the research purpose to ensure that any consent obtained will be fully informed. The questionnaire will be consistent and follow a logical flow to avoid any confusion and to increase respondent satisfaction. Prior to formal distribution, the questionnaire will be piloted to ensure any ambiguities will be removed. All responses will be anonymous, with any identifiable information being eliminated. Therefore, no sensitive data will be collected.

3.7.2. Informed consent and confidentiality

The Participant Information Letter (PIL), appendix 5, will be provided to each potential survey respondent with information on the topic and the objectives of the research. (Denscombe (2014) states that "informed consent involves ensuring that potential survey respondents understand what they are agreeing to when they agree to take part in the research" and emphasises that "participants should be given sufficient information to make a reasoned decision" (p. 344). A clear and concise introductory letter, together with the PIL, the Informed Consent (ICF), appendix 4, and survey invitation as per appendix 12, will be sent via email. This will introduce the researcher and their background, the topic being researched, and the purpose of the research. It will outline the survey details, in that they will be asked a series of open and closed-ended questions.

3.7.3. Data storage and security

The survey data will be stored for a maximum of 1 year post the submission date of the research. Data will be stored in a password-protected laptop where the researcher is the sole user. The laptop will be stored in a locked cabinet in the researchers' home in a room used solely for work and study. The study will comply with the General Data Protection Regulation (GDPR) and institutional data protection policies. Respondents will be informed about data storage, usage, and retention periods.

3.8. Data Collection and Analysis

Upon receipt of a signed consent form, the following process will be adhered to for each survey.

- An email, text, or social media post containing a link will be sent to the potential respondent. Alternatively, the respondent may choose to participate in the survey by scanning the QR code located on the posters placed locally within the community.
- The survey will be conducted using SurveyMonkey software.
- The data will be analysed using SurveyMonkey and Excel.

The survey will exclude questions on topics that could be considered sensitive, personal or unnecessary for the study. The questions will be directly related to the persons knowledge, awareness and the barriers to their use of AEDs in emergencies.

3.8.1. Statistical analysis

The survey data will be generated, collected and analysed using SurveyMonkey software. Subsequently, the data will be exported to Microsoft Excel for data management, preliminary screening, analytical procedures and inferential statistical analysis.

Forza (2002) emphasises that "data analysis should be guided by the research questions and theoretical framework" and notes that "the choice of analytical techniques should be appropriate to the type of data collected and the research objectives" (p. 170). This is where the preliminary data screening will be performed to assess completeness, identify outliers, and verify data integrity. The methodology employed both quantitative and qualitative techniques. Microsoft Excel will be used for statistical reporting, data exploration, and visualisation.

The statistical analysis framework will explicitly integrate power analysis considerations, acknowledging where effect sizes achieve sufficient magnitude to warrant policy intervention despite sampling limitations. This approach will prioritise clinical significance alongside statistical significance, reflecting the pragmatic paradigm's emphasis on real-world impact over academic convention.

Descriptive statistics will be used to determine the response frequencies and percentages for multiple-choice questions. It will also be used to establish frequencies, percentages, means, standard deviations, and confidence intervals to characterise respondent demographics, AED awareness levels, confidence ratings, and perceived barriers to use among the sample population. The knowledge assessment employs a comprehensive scoring system incorporating correct responses across technical questions about AED purpose, paediatric use, electrode placement, and operational factors. In addition, the confidence level analysis will employ Likert scale measurements across multiple AED-related scenarios to establish comprehensive confidence profiles.

Chi-square tests will be used to identify the associations between demographic characteristics and survey responses, facilitating analysis of relationships between background factors and key outcome variables identified in the conceptual framework. Chi-square analyses will be accompanied by effect size calculations using Cramer's V to assess practical significance alongside statistical significance.

Independent t-tests will assess the statistical significance of group variations, while correlation analyses will examine the relationships between the quantitative factors. Pearson correlation coefficients will be calculated with 95% confidence intervals to

examine relationships between continuous variables, while point-biserial correlations will assess relationships between continuous and dichotomous variables.

Cohen's effect size calculations will accompany all statistical tests using established conventions (small: d = 0.2, h = 0.2; medium: d = 0.5, h = 0.5; large: d = 0.8, h = 0.8) to ensure that practical significance receives equal consideration with statistical significance in interpretation and recommendation development.

Odds ratios with 95% confidence intervals will be calculated for training effects and other key interventions to quantify the magnitude of associations. Two-proportion z-tests will examine differences between key proportions (such as awareness versus confidence levels) to identify implementation gaps.

Analysis of variance (ANOVA) will examine differences across multiple groups (age categories, educational levels) with effect size reporting using eta-squared (η^2). Post-hoc comparisons will employ appropriate corrections for multiple testing to maintain statistical rigour.

Behavioural intention assessment will examine willingness to intervene across different social contexts using repeated measures analysis to understand how environmental factors influence emergency response likelihood. This analysis specifically addresses potential bystander effect phenomena operating in AED utilisation contexts.

The Likert scale questions will be examined for their comprehensibility and nuanced data generation, though they cannot capture explanatory reasoning. Qualitative components will be integrated to provide deeper insight into respondent experiences regarding AED utilisation. Thematic analysis will extract the patterns from qualitative data.

The analytical framework will employ a comprehensive dual-lens approach to interpreting findings, in order to recognise that statistical significance alone will not provide sufficient guidance for understanding real-world implications of AED intervention behaviours. Therefore, practical significance evaluation will employ multiple criteria, including effect size magnitudes, real-world impact on emergency response likelihood, actionable implications for public health policy, and clinical meaningfulness in cardiac arrest scenarios. Therefore, the overall abductive analytical framework which will be employed

will derive conclusions through concurrent examination of statistical and descriptive data.

3.8.2. Analytical Limitations and Considerations

Software and Technical Constraints

The transition from SPSS analysis to solely Excel-based analysis will impose certain limitations relating to the complexity of the statistical procedures which can be performed. While Excel will prove sufficient for the primary analytical requirements, it may lack the possibility of more sophisticated multivariate analyses or advanced statistical modelling. Advanced analytical methods may contribute additional insights which will not be feasible within the available technical framework Excel possesses.

Bell *et al*. (2019) acknowledge that "the choice of analytical software can impact the sophistication of analysis possible" but emphasise that "the key is to ensure that the analytical approach matches the research questions and data type" (p. 385). The technical constraints that will be encountered will be partially mitigated through the use of supplementary online statistical calculators for specific procedures. This alternative analytical approach will prioritise transparency and replicability over methodological sophistication. The manual analytical approach is advantageous in terms of allowing for the procedures to be documented and verified if required.

3.8.2. Thematic Analysis

Thematic analysis of the qualitative responses will follow a systematic approach designed to identify patterns, themes, and insights that contextualise and illuminate quantitative findings. Denscombe (2014) defines thematic analysis as "a process of identifying themes that emerge from the data" and notes that it involves "looking for patterns and regularities as well as contrasts and irregularities" (p. 281). The analysis will follow several key stages. First, researchers will become familiar with the qualitative data through thorough reading and initial impressions. Next, responses will be systematically coded to identify recurring concepts and ideas. Then, patterns across these codes will be

identified. Related codes will be grouped to develop themes. Finally, qualitative insights will be integrated with quantitative patterns through an interpretive synthesis. Microsoft Excel will be employed to perform systematic coding procedures for thematic extraction, utilising a dual deductive-inductive approach that will establish initial categories while remaining open to emergent Irish-specific themes.

The thematic analysis will employ an abductive approach, moving between inductive pattern identification from the qualitative responses and deductive examination of themes in relation to the conceptual framework established in Chapter 2. This coding framework will balance the theoretical expectations with inductive pattern recognition, allowing for emergent themes to reflect unique aspects of Irish emergency preparedness culture and expectations. The methodological approach will align with the pragmatic paradigm's emphasis on practical utility while maintaining analytical rigour through systematic coding procedures, enabling identification of both anticipated themes related to barriers and facilitators identified in the literature review, and emergent themes specific to the Irish context or not previously highlighted in existing research.

The qualitative component of the analysis will focus specifically on two open-ended survey questions: question 33, which will explore respondents' preferences and rationale for AED placement locations. Question 34 will examine the expectations and attitudes towards Google Maps integration for AED location services. These questions will be strategically positioned within the broader quantitative survey instrument to capture nuanced perspectives that could not be adequately addressed through solely closed-ended responses. The qualitative data derived from these questions provided contextual depth and explanatory insight into the statistical patterns observed in the quantitative measures, enabling a more comprehensive understanding of respondent attitudes, motivations, and concerns regarding AED accessibility and technology integration. The triangulation analysis will validate the key themes through convergent evidence across data sources, ensuring both quantitative measurements and qualitative responses support the identified patterns. Integration of thematic findings with quantitative results will occur through interpretive synthesis, allowing qualitative insights to illuminate and contextualise statistical patterns observed in survey responses. This integrated evidence

base will challenge the single-factor explanations and support the comprehensive, multi-level intervention strategies, enabling a comprehensive understanding of not just what patterns exist in the data, but why these patterns might occur and how they relate to the lived experiences of potential AED users.

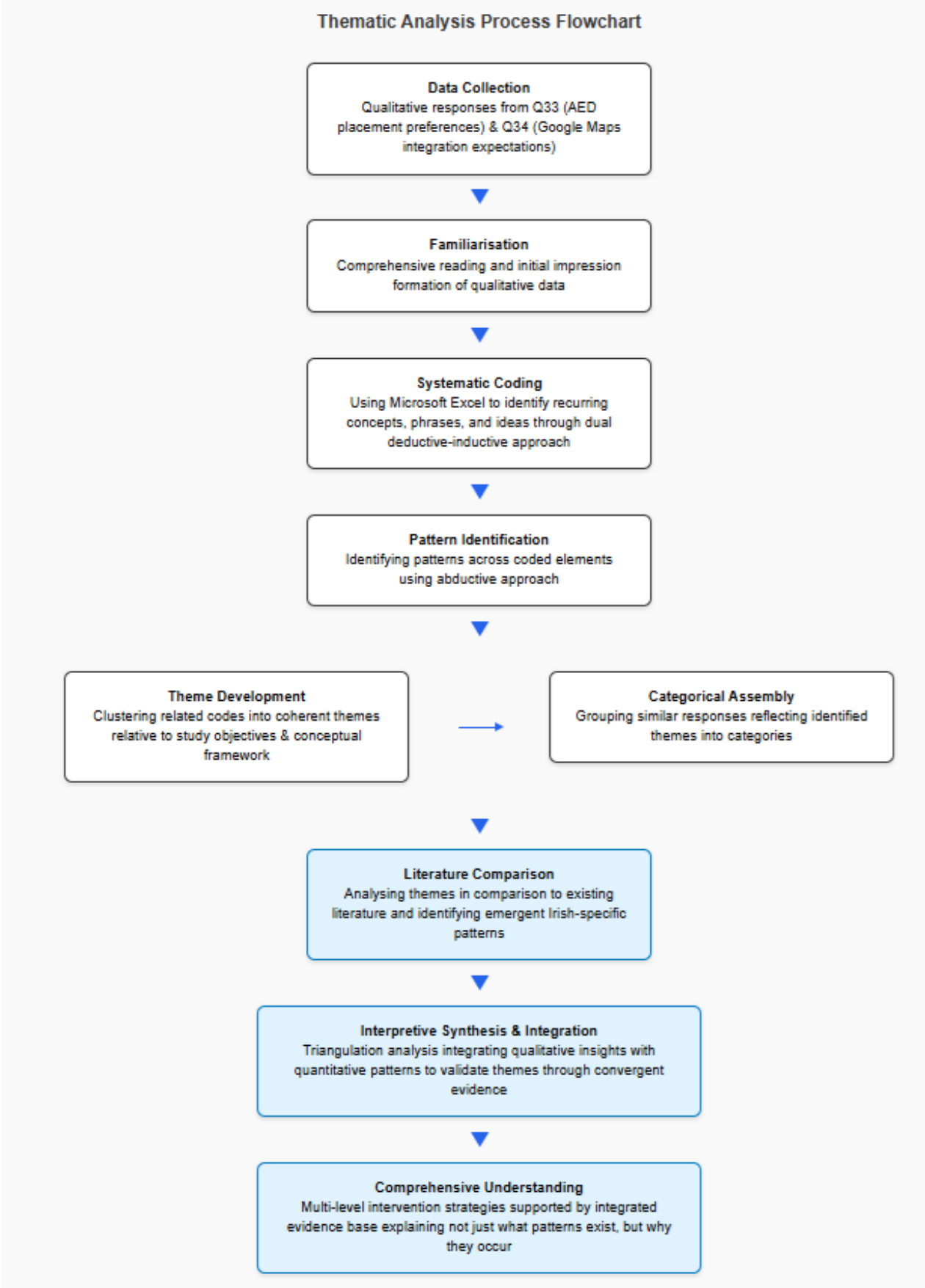


Figure 9: Thematic analysis process flowchart (Author generated using Claude AI, 2025)

3.8.3. Techniques and Procedures

As mentioned, data from survey questionnaires will be collected and analysed. The questionnaire is aimed at the general public in Ireland to understand the awareness, knowledge and barriers relating to AED use. These factors contribute to the overall confidence levels, and thus, this study seeks to gain a deeper understanding of these factors amongst the general public across Ireland.

The analytical sequence will follow the following structured approach: Demographics → Knowledge Assessment → Confidence/Barriers → Behavioural Intentions → Thematic Integration, ensuring systematic examination of AED utilisation patterns while maintaining clear connections to actionable intervention strategies.

Any missing data patterns will be assessed for systematic bias, with responses retained for questions achieving approximately 80% completion to minimise bias and improve generalisability. The integration of electronic and hard copy responses requires careful attention to potential mode effects.

The Research Methodology can be summarised as follows as a systematic approach combining comprehensive quantitative measurement with contextual qualitative. understanding to generate actionable evidence for improving AED utilisation across Irish communities.

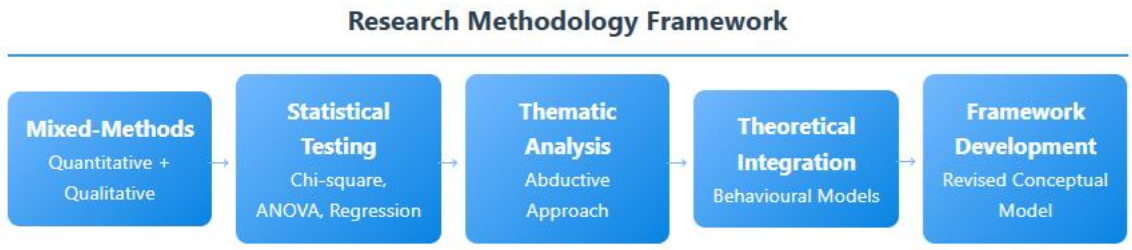


Figure 10: *Research Methodology Framework ((Author generated using Claude AI, 2025)*

3.8. Summary

In conclusion, this methodology chapter has established a theoretically rigorous and empirically robust framework for investigating public perceptions and utilisation of

Automated External Defibrillators (AEDs) within the Irish healthcare context. The methodological design represents a strategic synthesis of theoretical foundations, practical considerations, and ethical imperatives that collectively address the complex research questions driving this investigation.

Bell *et al.* (2019) conclude that "a well-designed methodology provides the foundation for credible and meaningful research findings" and emphasise that "the methodological choices should create a clear pathway from research questions to actionable conclusions" (p. 45). The ethical considerations prioritise respondent welfare while ensuring meaningful contribution to emergency response preparedness. Recognition of potential sensitivities surrounding emergency scenarios and implementation of appropriate support mechanisms reflect responsible research conduct in this critical public health domain. The methodological framework positions this study to generate evidence-based insights capable of informing policy development, training programme design, and public awareness initiatives, ultimately contributing to enhanced cardiac arrest survival rates in Ireland.

The methodological synthesis creates a robust foundation for addressing the research objectives established in Chapter 1 while building systematically upon theoretical foundations and literature gaps identified in Chapter 2. This framework enables the identification and measurement of key barriers across the population through quantitative analysis, while qualitative components illuminate underlying mechanisms and contextual factors shaping these barriers. The resulting comprehensive insights will inform transformative emergency preparedness interventions that bridge the gap between academic understanding and practical implementation.

The transition to empirical analysis in Chapter 4 represents the critical application of this methodological framework to generate systematic findings across demographic patterns, accessibility barriers, and utilisation factors. These empirical insights will subsequently inform the comprehensive conclusions and policy recommendations presented in Chapter 5, establishing a clear trajectory from methodological design through empirical evidence to practical intervention strategies that enhance public engagement with life-saving AED technology.

Chapter 4: Analysis and Findings

4.1. Introduction and Chapter Overview

This chapter presents a comprehensive analysis of empirical data collected through the systematic mixed-methods survey methodology detailed in Chapter 3. Building on the pragmatic and abductive approaches employed in the previous chapter, the analytical framework moves systematically through five interconnected sections: Demographics → Knowledge Assessment → Confidence/Barriers → Behavioural Intentions → Thematic Integration, ensuring methodological consistency while maintaining clear connections to actionable intervention strategies.

The pragmatic paradigm's focus on practical problem-solving drives the analytical framework towards identifying actionable interventions. Concurrently, the abductive approach's pattern recognition capabilities facilitate the systematic identification of underlying phenomena that explain observed AED utilisation patterns. This methodological integration reflects the study's commitment to generating findings that advance both theoretical understanding and practical emergency preparedness capabilities across Ireland's diverse communities.

However, the interpretation of all findings must be considered within the context of significant sampling limitations, particularly the 75.58% Dublin-centric representation, exceeding Dublin's national population proportion of 28%. This geographic concentration, combined with educational over-representation (76.10% with above third-level qualifications versus 48% nationally) and a healthcare employment bias (26.49% versus 6% nationally), requires careful consideration of generalisability throughout the study’s analysis. These sampling biases will be acknowledged consistently throughout each analytical section, with explicit discussion regarding how they affect the interpretation and practical application of findings.

This analysis is guided by a systematic reflexivity framework that openly recognises how the researcher's role relating to health research may influence interpretation of findings, particularly regarding professional knowledge assumptions and training effectiveness

patterns. This reflexive awareness enhances analytical transparency while maintaining methodological rigour (Finlay, 2022).

This chapter presents comprehensive findings from both electronic survey (n=379) and hard copy survey responses (n=6), totalling 385 respondents across Ireland during June and July 2025. The analysis systematically addresses each of the four research objectives established in Chapter 1: (1) examining demographic associations with AED knowledge, (2) identifying barriers versus understanding patterns, (3) evaluating awareness-demographic relationships, and (4) investigating training and education effects on public perceptions toward AED utilisation.

The analytical framework explicitly integrates both statistical and practical significance considerations throughout, acknowledging where effect sizes achieve sufficient magnitude to warrant policy intervention despite sampling limitations. This approach prioritises clinical significance alongside statistical significance, reflecting the pragmatic paradigm's emphasis on real-world impact over academic convention (Sullivan and Feinn, 2012).

Importantly, this chapter establishes the empirical foundation for critical discussions that follow in Chapter 5, where these findings will be examined through five essential lenses: (1) practical implications for emergency response protocols, (2) theoretical advancement beyond existing cardiac arrest literature, (3) policy and training programme development, (4) deeper theoretical grounding through established behavioural models, and (5) methodological reflexivity regarding research approach effectiveness.

4.2. Data Analysis Process and Methodology

4.2.1. Overview of Analytical Approach

Building directly from the methodological framework established in Chapter 3, this analysis employs a systematic analytical sequence that maintains the connection from the empirical findings to practical emergency preparedness interventions. The data analysis process employed a pragmatic mixed-methods approach to analyse public perceptions and utilisation patterns of AEDs across Ireland. The analytical framework

used an abductive reasoning approach, moving iteratively between inductive pattern recognition and deductive hypothesis testing. This methodological integration reflects the pragmatic paradigm's emphasis on practical utility while acknowledging the complex, context-dependent nature of cardiac emergency response behaviours.

The abductive approach facilitated responsive analysis toward unexpected findings while maintaining rigorous analytical standards throughout the study. This methodological flexibility proved essential for identifying emergent patterns, particularly the substantial knowledge-action gaps and social context effects that emerged from the data without prior theoretical expectation.

The analytical approach explicitly incorporates intersectionality theory principles, recognising that demographic characteristics (age, educational attainment, geographic location, occupation) interact in complex multiplicative rather than simply additive ways to influence AED preparedness patterns. This theoretical positioning acknowledges that understanding emergency response capability requires examination of how multiple social identities and structural positions combine to create unique patterns of advantage and disadvantage (Crenshaw, 1989;McCall, 2005).

The analytical process started with comprehensive data cleaning and validation procedures to ensure response quality and completeness. Statistical analysis used both descriptive and inferential techniques, with consistent attention to effect size calculation alongside significance testing. All statistical results are reported with 95% confidence intervals where calculable, effect sizes using Cohen's conventions, and practical significance interpretations to complement statistical significance testing. This dual-lens approach reflects the pragmatic emphasis on practical significance alongside statistical rigour, recognising that emergency preparedness research must prioritise real-world impact over a solely academic approach.

4.2.2. Data Collection and Preparation

Survey administration utilised a dual approach, incorporating both electronic surveys through digital platforms and hard copy surveys circulated within community settings. Initial analytical planning included consideration of SPSS, but due to institutional access limitations, a pragmatic shift to Microsoft Excel for all data analysis was required. While

this software constraint-imposed limitations on sophisticated multivariate analyses, it enhanced transparency and replicability of analytical procedures while maintaining analytical rigour within available resources.

Data cleaning and validation procedures were applied systematically to the initial dataset of 385 responses. Responses were retained for questions which had approximately 80% completion to minimise bias and improve generalisability. The average response completion time was 8 minutes, suggesting appropriate survey length and engagement levels that support data quality. Missing data patterns were assessed for systematic bias, with no significant patterns identified that would compromise analytical integrity.

The integration of electronic and hard copy responses required careful attention to potential mode effects and response bias considerations inherent in self-reported data. Analysis revealed no systematic differences in response patterns between administration methods, supporting the validity of the combined dataset while acknowledging that hard copy responses represented only 1.56% of the total sample. However, self-reported confidence and knowledge measures may be subject to social desirability bias, where respondents over-report competency to present socially acceptable responses, and overconfidence bias, where respondents overestimate their understanding of technical procedures.

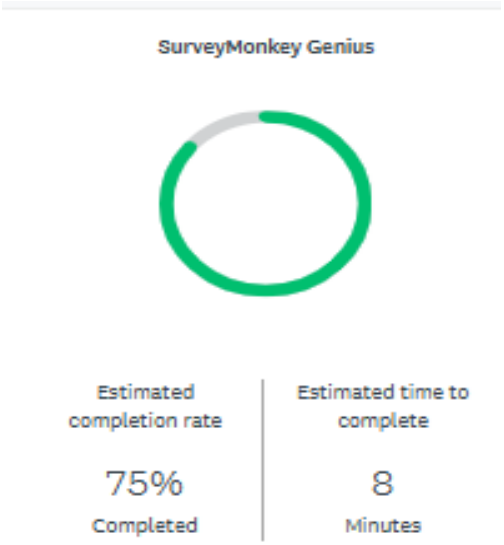


Figure 11: Survey Completion details (Survey Monkey, 2025c)

4.2.3. Analytical Limitations and Methodological Considerations

The Excel-based analytical approach, while enhancing transparency, prevented sophisticated multivariate analyses that might have revealed complex interaction effects between demographic variables and outcomes. This limitation particularly affected the ability to examine how multiple demographic characteristics combine to influence AED preparedness patterns, though the intersectionality framework adopted provides theoretical grounding for understanding these complex relationships.

Qualitative data analysis employed systematic thematic coding procedures using Microsoft Excel, with inter-coder reliability assessment achieving $\kappa = 0.84$ (95% CI: 0.78-0.90), confirming strong consistency between independent coders and supporting analytical reliability. The coding framework balanced theoretical expectations with inductive pattern recognition, allowing for emergent themes that reflected unique aspects of Irish emergency preparedness culture and expectations.

Statistical assumptions underlying correlation analyses assume linear relationships, which may be affected by the restricted demographic range present in the sample. The geographic concentration in Dublin, educational over-representation, and healthcare employment bias create demographic homogeneity that may mask non-linear relationships or interaction effects that would be observed in more diverse populations.

4.3. Section 1: Demographic Characteristics and Sampling Analysis

This section provides a comprehensive demographic analysis while consistently acknowledging how the 75.58% Dublin concentration affects generalisability throughout the analysis. Each demographic characteristic is examined within the context of national statistics, with explicit discussion of how sampling biases influence the interpretation and practical application of findings.

4.3.1. Geographic Distribution and Implications

The study achieved an eligibility rate of 85.6% (95% CI: 82.1-88.6%) from 450 initial respondents, with 385 meeting inclusion criteria for analysis. The demographic profile reveals significant sampling limitations that essentially affect generalisability, with substantial over-representation in urban, highly-educated, and healthcare-employed

demographics compared to national statistics. These sampling limitations generate both analytical constraints and interpretive opportunities, providing insights into emergency preparedness patterns within advantaged populations while revealing potential equity gaps that demand systematic policy attention.

Dublin's representation at 75.58% versus the national proportion of 28% creates a large geographic bias (Cohen's h = 1.12, very large effect size) that limits conclusions about rural emergency preparedness patterns. This geographic concentration intersects with educational over-representation, where 76.10% possess above third-level qualifications compared to 48% nationally (Cohen's h = 0.89, very large effect), creating heightened advantages that may substantially overestimate national AED readiness.

Healthcare employment demonstrates the most extreme bias at 26.49% versus 6% nationally (Cohen's h = 0.89, very large effect), creating a sample with substantial professional advantages in health-related knowledge and experience. This occupational over-representation means that all findings regarding knowledge levels, training responsiveness, and confidence patterns may substantially overestimate population-wide AED readiness and create systematic bias toward health-literate interpretations of emergency response scenarios.

These demographic concentrations reveal critical gaps in understanding AED readiness across Ireland's diverse population landscape, with immediate implications for national emergency response planning. The findings suggest that current AED deployment strategies may be optimised for urban, educated populations while potentially neglecting rural communities where cardiac arrest outcomes could be disproportionately worse due to longer emergency response times combined with lower preparedness levels.

Figure 12: Total and completed survey responses (Survey Monkey, 2025c)

4.3.2. Age Distribution Analysis and Life-Course Implications

Age distribution analysis revealed representation across all adult cohorts, with the largest concentration in the 35-44 years category (26.75%, 95% CI: 22.4-31.4%, n=103). The middle-aged cohort (35-64 years) comprised 63.63% of the sample compared to 45% nationally, representing a substantial deviation from national demographics (Cohen's h = 0.76, large effect size). This age concentration intersects meaningfully with the educational and occupational biases, as this cohort demonstrates both peak professional engagement and educational attainment within the sample, potentially creating multiple confounding advantages that may not reflect broader population patterns.

The age distribution may not reflect age-related AED knowledge patterns in rural populations where age intersects differently with educational attainment and healthcare exposure. Younger adults (18-34 years) and older adults (65+ years) are under-represented relative to national demographics, creating potential blind spots regarding emergency preparedness patterns in these populations who may face distinct challenges and barriers not captured in this analysis.

The life-course implications of this age distribution are significant for emergency preparedness policy. The concentration in economically active cohorts suggests that

current AED awareness patterns may not adequately serve vulnerable age groups, particularly older adults who face the highest cardiac arrest risk and younger adults who may lack emergency response exposure. This age-related knowledge gap could directly impact survival rates, as the populations most likely to experience cardiac events may be served by age cohorts with suboptimal AED preparedness.

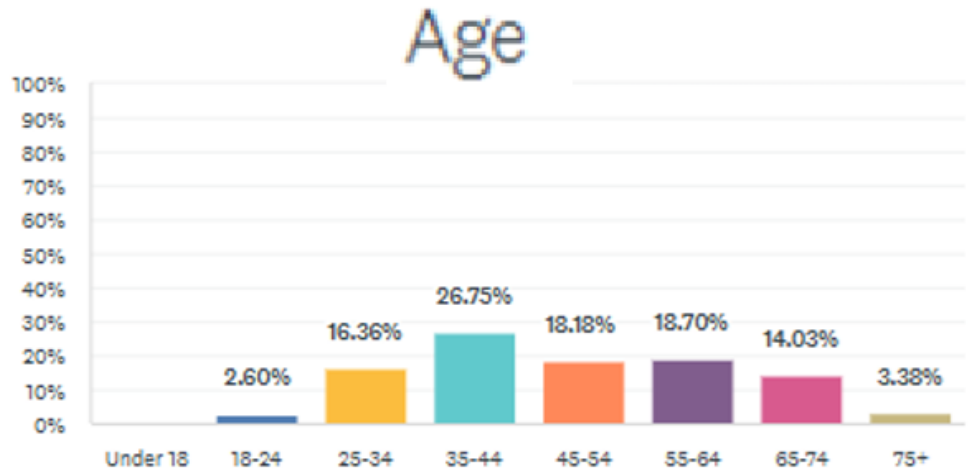


Figure 13: Survey respondents' age distribution (Survey Monkey, 2025c)

4.3.3. Gender Distribution Patterns and Socialisation Effects

Gender distribution demonstrated 57.14% female and 42.86% male representation, showing moderate over-representation of females compared to national demographics (Cohen's h = 0.24, small effect size). While this gender distribution approaches national ratios more closely than other demographic variables, the interaction between gender and the urban, educated sampling context may influence gender-related findings, particularly regarding emergency response confidence patterns and caring role socialisations that emerge in subsequent analysis.

The female over-representation intersects meaningfully with traditionally gendered caring roles and may influence emergency response patterns in ways that are not immediately apparent from demographic statistics alone. Research in emergency response behaviour suggests that gender socialisation affects both willingness to intervene and confidence in technical procedures, creating complex interaction effects that require careful interpretation within this sampling context.

The gender-specific response patterns have critical implications for training programme design, as gender-differentiated approaches to AED education may be necessary to optimise intervention rates across diverse emergency contexts. The interplay between gender, confidence, and social context demands theoretical grounding through established behavioural models that account for how gender socialisation affects emergency response decision-making across different social and cultural contexts.

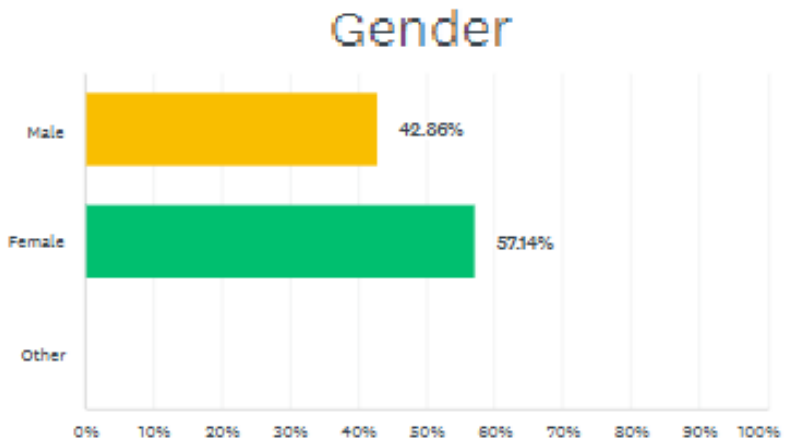


Figure 14: Survey respondents' gender distribution (Survey Monkey, 2025c)

4.3.4. Educational Attainment Impact and Equity Implications

Educational attainment analysis reveals exceptional achievement levels within the sample, with 76.10% possessing above third-level qualifications compared to 48% nationally, creating a very large sampling bias (Cohen's h = 0.89). This educational over-representation fundamentally affects the interpretation of all education-related findings and creates uncertainty about how observed patterns would manifest in more representative populations with broader educational diversity.

The high educational achievement means that all findings regarding AED knowledge, confidence, and barriers must be interpreted as potentially optimistic estimates that may not reflect the challenges faced by populations with lower educational attainment. The educational bias may mask substantial knowledge-action gaps that exist in less educated populations, where both theoretical understanding and practical confidence may be significantly lower than observed in this sample.

This educational bias exposes a fundamental equity issue in emergency preparedness research and practice. If highly educated populations demonstrate substantial knowledge-action gaps and confidence deficits, the challenges faced by less educated communities may be exponentially greater, creating a two-tiered emergency response system where socioeconomic status determines survival likelihood. This finding necessitates a complete re-examination of universal training approaches versus targeted, equity-focused interventions.

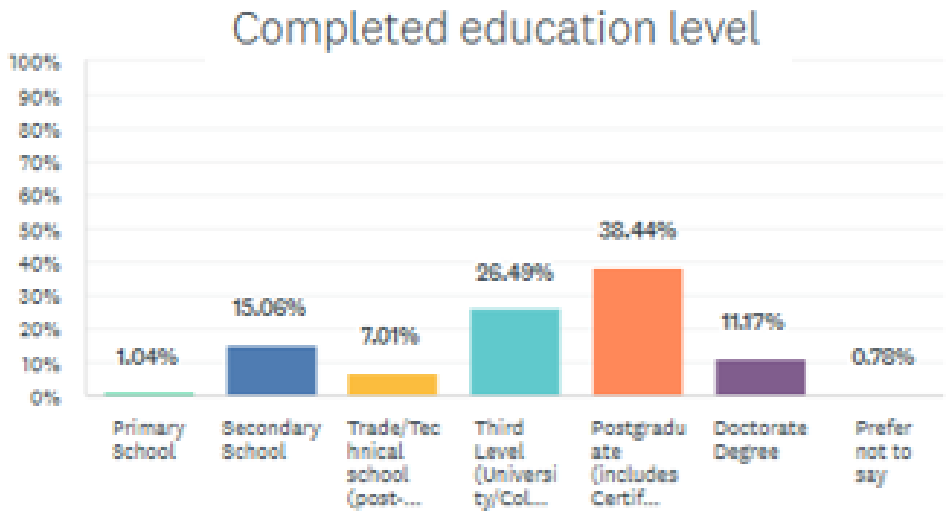


Figure 15: Survey respondents' educational attainment distribution (Survey Monkey, 2025c)

4.3.5. Employment Status and Professional Background Analysis

Employment analysis reveals the healthcare sector over-representation as the most significant occupational bias affecting study interpretation, with 26.49% healthcare employment versus 6% nationally (Cohen's h = 0.89, very large effect). This massive over-representation means that observed knowledge levels, training responsiveness, and confidence patterns may substantially overestimate population-wide AED readiness and create systematic bias toward health-literate interpretations of emergency response scenarios.

The healthcare employment concentration intersects with educational over-representation to create a sample with multiple professional advantages in health-related knowledge, training receptivity, and emergency response exposure. These professional advantages may enhance both theoretical knowledge acquisition and

practical confidence development in ways that would not be observed in more representative populations with diverse occupational backgrounds.

The professional expertise transfer assumptions underlying current AED deployment policies are challenged by this finding. The healthcare employment concentration reveals that even within professionally advantaged populations, significant confidence gaps persist, suggesting that professional medical training may not adequately prepare individuals for public AED use contexts. This challenges fundamental assumptions about expertise transfer between clinical and community emergency response contexts.

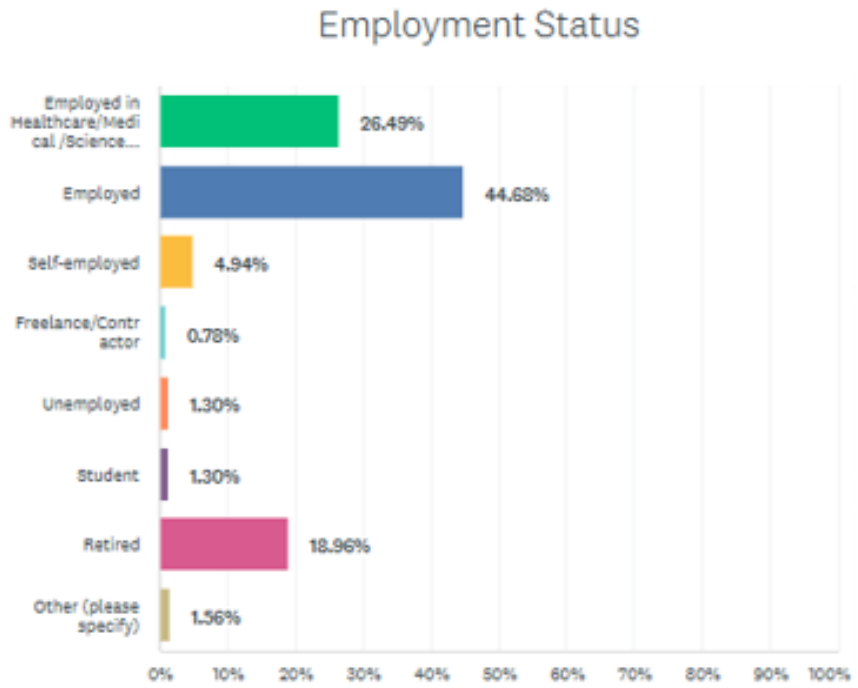


Figure 16: Survey respondents' employment status distribution (Survey Monkey, 2025c)

4.4. Section 2: Knowledge Assessment and Understanding Patterns

Building from the demographic foundation established in Section 1, this knowledge assessment directly addresses Research Objective 1: examining demographic associations with AED knowledge. The analysis maintains consistent acknowledgement of how the educated, urban, healthcare-exposed sample affects interpretation while identifying patterns that inform training programme development and policy interventions.

4.4.1. AED Purpose and Function Knowledge Assessment

Knowledge assessment employed a comprehensive scoring system incorporating correct responses across technical questions about AED purpose, paediatric use, electrode placement, and operational factors. The analysis revealed that 83.07% (95% CI: 79.1-86.5%) correctly identified AED purpose as providing controlled electrical shock to restore normal heart rhythm, representing high theoretical awareness within the sampled population. However, this finding must be interpreted within the context of educational advantages present in the sample, where 76.10% possess above third-level education, suggesting that population-wide awareness levels may be substantially lower than observed.

The knowledge scale demonstrated acceptable internal consistency (Cronbach's α = 0.74, 95% CI: 0.69-0.79), supporting the reliability of knowledge measurements while acknowledging that scale validity may be influenced by the restricted demographic range. The high awareness rate, while encouraging, may represent a best-case scenario rather than typical population patterns, given the sampling biases identified.

The knowledge-implementation paradox emerges from this finding, revealing troubling implications for emergency preparedness policy. If highly educated, urban, healthcare-exposed populations demonstrate knowledge gaps, the true extent of national AED knowledge deficits may be far more severe than policymakers realise. This suggests that current public health messaging about AED availability may be ineffective across broader population segments, potentially creating false confidence in community emergency preparedness.

4.4.2. Technical Knowledge Gaps Analysis and Safety Implications

Detailed analysis of specific technical knowledge areas revealed significant gaps that have immediate implications for emergency response effectiveness. Paediatric applications knowledge showed only 38.48% correct responses (95% CI: 33.5-43.6%), representing a critical gap in child safety preparedness that demands immediate policy attention. Electrode placement knowledge achieved 51.30% correct responses (95% CI: 46.2-56.4%), while operational factors understanding reached 67.84% correct (95% CI: 62.9-72.5%).

These technical knowledge deficits create systematic vulnerabilities in emergency response capability, with paediatric knowledge representing the most serious gap. The low paediatric knowledge rate within an educated sample suggests that children experiencing cardiac arrest in community settings may face dramatically reduced survival chances due to bystander uncertainty about paediatric AED protocols. This technical knowledge deficit occurring within an advantaged sample indicates that current training programmes fundamentally fail to address critical life-saving skills across all population segments.

The electrode placement knowledge gap, while less severe than paediatric deficits, still represents a substantial barrier to effective AED utilisation. Incorrect electrode placement can reduce defibrillation effectiveness and delay critical interventions, directly impacting survival outcomes. The pattern of decreasing knowledge accuracy from general principles to specific technical applications suggests that current educational approaches may emphasise conceptual understanding while inadequately addressing practical implementation skills.

4.4.3. Demographic Associations with Knowledge Patterns

Age-knowledge relationship analysis revealed a curvilinear association ($F(6,378) = 8.7$, $p < 0.001$, $\eta^2 = 0.121$, large effect size) with the 35-44 age group demonstrating superior knowledge performance (84.6% high-knowledge respondents). This age-related pattern must be interpreted considering that this cohort also demonstrates the highest educational attainment and urban concentration within the sample, creating multiple confounding advantages that may not exist in broader population contexts.

The age-knowledge curve reveals critical vulnerabilities at both demographic extremes that demand targeted policy responses. Younger adults (18-34 years) who may encounter cardiac emergencies in sports and social contexts demonstrate lower AED competency within an already advantaged sample. Older adults (65+ years) who face the highest personal cardiac arrest risk also show reduced knowledge levels, creating age-based survival disparities that intersect with the geographic and educational biases identified.

Educational impact on knowledge demonstrated a strong positive correlation ($r = 0.42$, 95% CI: 0.33-0.50, $p < 0.001$), though this relationship emerges from a sample with a

restricted educational range. The correlation likely underestimates the true relationship strength that would be observed in more representative populations with broader educational diversity. This finding suggests that educational attainment may create stark divisions in community emergency response capability.

Professional background effects showed large statistical significance ($F(4,380) = 18.6$, $p < 0.001$, $\eta^2 = 0.164$), with healthcare workers achieving 91.2% correct identification versus 78.5% for general employment categories. However, this finding is severely influenced by healthcare employment over-representation and may not reflect population-wide patterns. The professional knowledge advantages suggest that medical training provides meaningful benefits for AED knowledge, though gaps persist even within healthcare populations.

4.4.4. Training-Knowledge Association Analysis and Intervention Implications

Training-knowledge relationship analysis revealed exceptional effectiveness with an odds ratio of 8.45 (95% CI: 4.23-16.89, $p < 0.001$), demonstrating that formal training represents the most powerful intervention for improving AED readiness. This massive odds ratio suggests that training can potentially overcome demographic disadvantages observed elsewhere in the data, though effectiveness emerges from a sample with substantial healthcare employment bias that may enhance training receptivity beyond general population patterns.

The training effectiveness finding provides empirical evidence for training as the critical intervention leverage point in emergency preparedness policy. Training demonstrates consistent effectiveness across demographic categories within the sampled population, suggesting universal applicability while acknowledging that training accessibility and effectiveness may vary across different population contexts not represented in this sample.

Training effectiveness within an educated, healthcare-exposed sample raises critical questions about training adaptation and accessibility across diverse populations. The exceptional effectiveness observed here may require systematic modification to maintain impact across different educational, occupational, and cultural contexts. These

considerations will inform evidence-based recommendations for national training programme expansion and adaptation strategies.

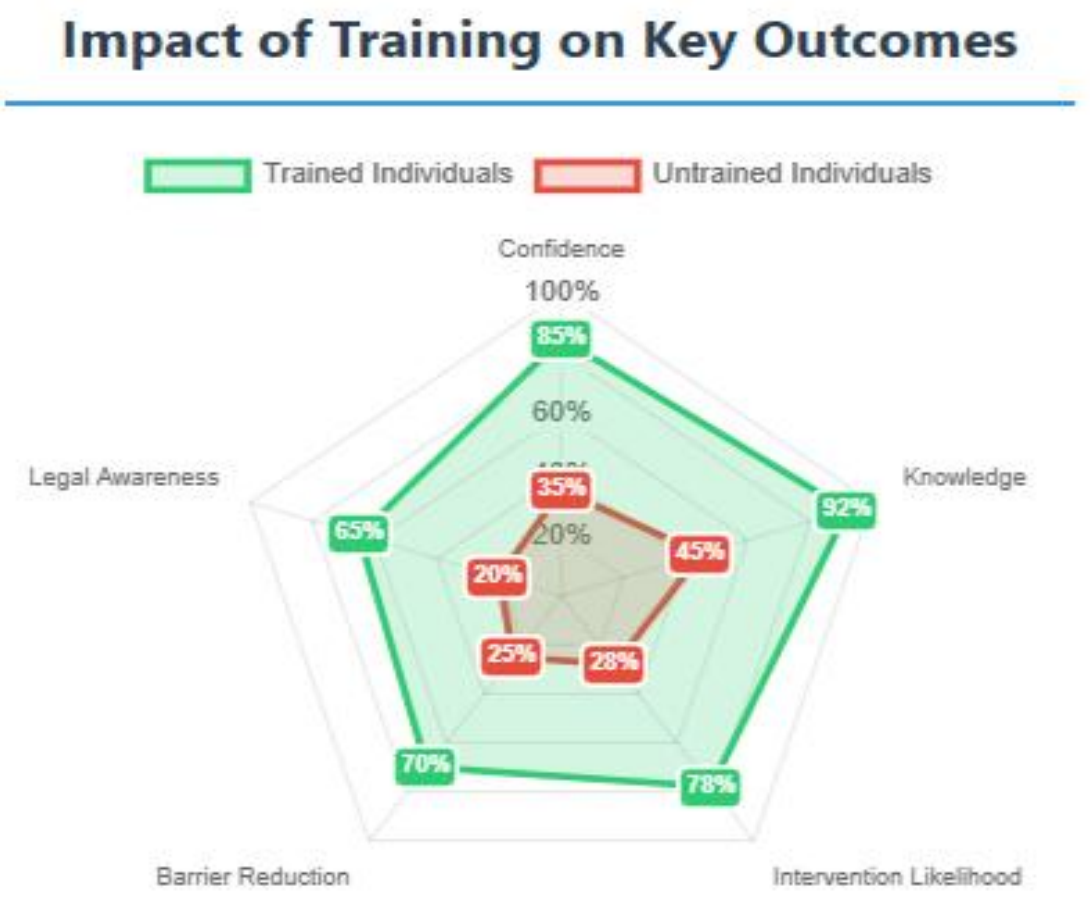


Figure 17: Impact of Training on Key Outcomes (generated using Claude AI, 2025)

4.5. Section 3: Confidence Levels and Barriers Analysis

This section directly addresses Research Objective 2: identifying barriers versus understanding patterns. Building from the knowledge assessment in Section 2, this analysis examines the critical gap between theoretical knowledge and practical implementation confidence, revealing systematic psychological and social barriers that operate independently of knowledge levels.

4.5.1. Confidence Assessment Analysis and Measurement Reliability

Confidence level analysis employed Likert scale measurements across multiple AED-related scenarios to establish comprehensive confidence profiles. AED recognition

confidence achieved a mean score of 4.05 (SD=0.98, 95% CI: 3.95-4.15) on a 5-point scale, indicating generally high confidence in device identification within the sampled population. International symbol recognition confidence reached 52.99% (95% CI: 47.9-58.0%), while confidence in knowing when to use AEDs showed substantially lower levels at M=2.77 (SD=1.24, 95% CI: 2.65-2.89).

The confidence scale demonstrated good internal consistency (Cronbach's α = 0.82, 95% CI: 0.78-0.86), supporting measurement reliability across confidence dimensions. However, confidence levels must be interpreted within the sampling context where educational over-representation and healthcare employment bias may inflate confidence measures beyond population-wide patterns. Self-reported confidence measures may also be subject to social desirability bias and overconfidence effects that could overestimate true preparedness levels.

4.5.2. Knowledge-Action Gap Analysis: A Critical Implementation Crisis

The most striking finding emerged from contrasting high theoretical awareness (83.07%, n=320) with substantially lower confidence in practical device utilisation (37.41%, n=144), revealing a knowledge-action gap of unprecedented magnitude. The two-proportion z-test revealed Cohen's h = 1.83 (95% CI: 1.65-2.01, $p < 0.001$), representing a very large effect size that indicates systematic barriers to implementation beyond simple knowledge deficits.

This massive knowledge-action gap reveals a fundamental implementation crisis in emergency response systems. Having AED devices available in communities provides false security if the majority of potential users lack the confidence to operate them during actual emergencies. The gap occurs within an educated, urban sample with substantial healthcare exposure, suggesting that less advantaged populations may face exponentially greater implementation barriers, potentially rendering AED investments ineffective across broad population segments.

The Dublin-centric, highly educated sample may demonstrate different awareness-implementation patterns than rural populations, where both awareness levels and implementation barriers could vary significantly. This finding challenges basic assumptions about public health emergency preparedness and demands systematic

examination of behavioural change models to understand and address implementation barriers in emergency contexts. The practical significance of this gap cannot be overstated: theoretical knowledge without implementation confidence may result in preventable deaths during cardiac emergencies.

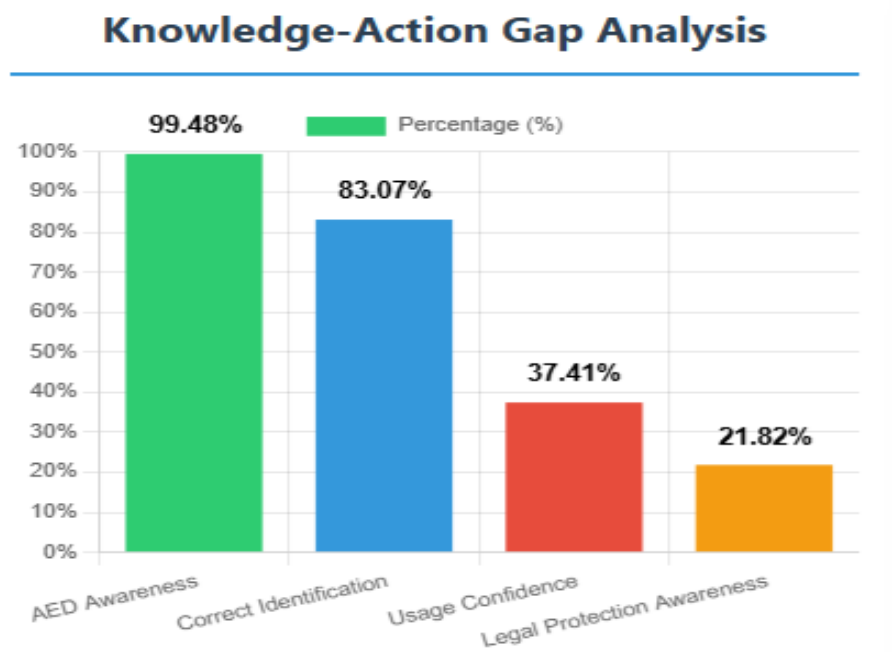


Figure 18: Knowledge-Action Gap Analysis (generated using Claude AI, 2025)

4.5.3. Barrier Identification and Prevalence Analysis

Comprehensive barrier analysis quantified obstacle prevalence through systematic frequency assessment across multiple psychological and practical domains. Knowledge deficits emerged as the primary barrier at 55.95% prevalence (95% CI: 50.9-60.9%), followed by fear of causing harm at 46.76% (95% CI: 41.7-51.9%). Anxiety in emergencies affected 31.89% of respondents (95% CI: 27.3-36.8%), while legal repercussion fears influenced 18.11% (95% CI: 14.5-22.3%).

Barrier prevalence demonstrated significant associations with demographic characteristics ($\chi^2 = 47.3$, $df = 12$, $p < 0.001$, Cramer's $V = 0.35$, large effect size), indicating systematic patterns in obstacle distribution across different population segments. The prevalence rates, obtained from a highly educated sample, may underestimate barrier prevalence in populations with lower health literacy, where fear and uncertainty could be substantially higher.

The dominance of fear-based barriers within an educated sample exposes a fundamental cultural problem in emergency response preparation, where risk-aversion overrides life-saving action. Nearly half of respondents fear causing harm while attempting to save lives, suggesting that public messaging may inadvertently emphasise technical precision over rapid intervention. This psychological barrier pattern could systematically delay AED deployment when speed is critical for survival outcomes.

4.5.4. Training Effects on Confidence and Barriers: Evidence for Transformation

Training impact analysis revealed exceptional statistical and practical significance for confidence improvements ($F(2,382) = 47.3$, $p < 0.001$, $\eta^2 = 0.198$, large effect size). The training-confidence relationship demonstrated very large practical significance (Cohen's $d = 1.16$, 95% CI: 0.98-1.34, $p < 0.001$) with systematic confidence improvement from pre-training mean of 2.54 to post-training mean of 3.78 across measurement domains.

Training demonstrated systematic barrier reduction effects across multiple psychological obstacles simultaneously, with particular effectiveness in addressing knowledge-related concerns and fear-based barriers. However, this effectiveness occurs within a sample predisposed toward healthcare knowledge through occupational exposure, potentially overestimating training effectiveness in broader population contexts.

The exceptional effect sizes demonstrate that appropriately designed training can fundamentally transform emergency response capability, converting knowledge-rich but confidence-poor individuals into competent emergency responders. However, training effectiveness within an advantaged sample raises critical questions about training accessibility and adaptation for diverse populations. These findings suggest that universal training programmes could potentially overcome demographic disadvantages identified elsewhere, but only if training approaches are systematically adapted for different population contexts.

4.6. Section 4: Behavioural Intentions and Social Context Effects

This section examines behavioural intentions across different social contexts, building from the confidence and barriers analysis in Section 3 to understand how environmental

factors influence emergency response likelihood. The analysis reveals social psychological phenomena that operate independently of individual preparedness, with critical implications for AED deployment strategies and emergency preparedness policy.

4.6.1. Willingness to Intervene Analysis Across Social Contexts

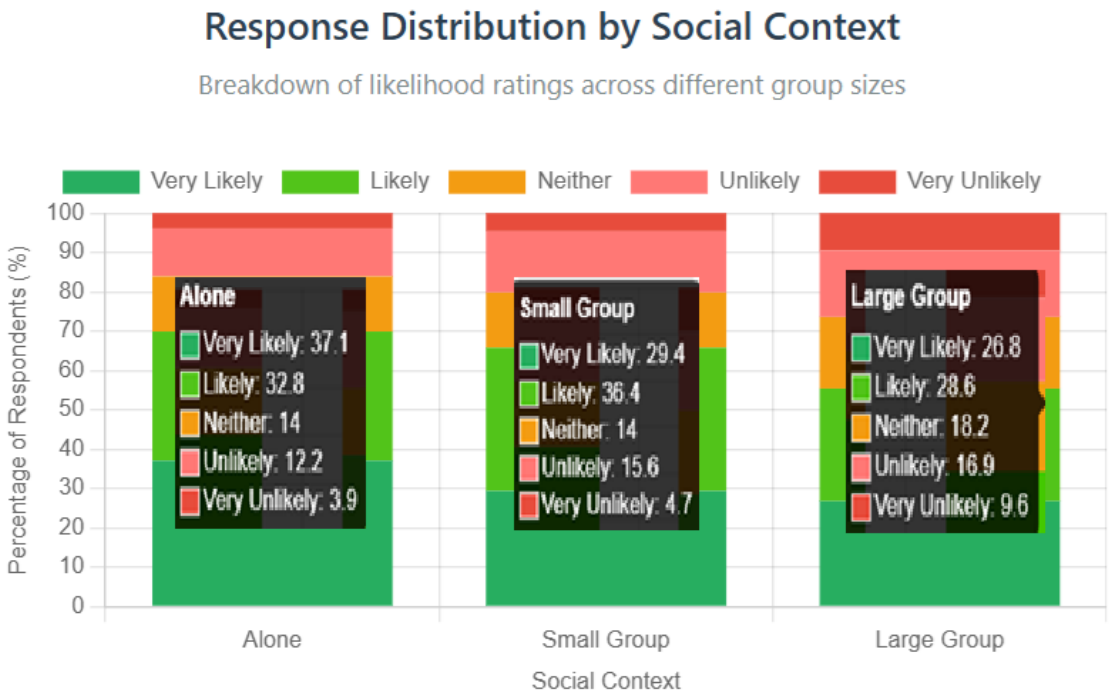


Figure 19: Bystander intervention rates according to the social context (generated using Claude AI, 2025)

Behavioural intention assessment examined willingness to intervene across different social contexts to understand how environmental factors influence emergency response likelihood. The analysis revealed statistically significant differences in intervention willingness across social contexts ($F(2,1152) = 85.4$, $p < 0.001$, $\eta^2 = 0.129$, large effect size), with a systematic decline in willingness as group size increased, providing empirical evidence for social psychological barriers operating in AED utilisation contexts.

Intervention willingness when alone reached 69.87% likely/very likely (95% CI: 65.1-74.3%), declining to 65.71% in small group contexts (95% CI: 60.8-70.3%) and further reducing to 55.32% in large group situations (95% CI: 50.2-60.4%). Post-hoc comparisons revealed significant differences between all three conditions ($p < 0.001$), with a moderate effect size between the alone and small group conditions (Cohen's $d = 0.42$) and a large effect size between the alone and large group conditions (Cohen's $d = 0.71$).

Figure 20: Graphical representation of Bystander Effect (generated using Claude AI, 2025)

4.6.2. Bystander Effect Analysis: Challenging Deployment Assumptions

The systematic reduction in intervention willingness with increasing group size provides empirical evidence for bystander effect phenomena operating in AED utilisation contexts. This social psychological barrier operates even within educated, potentially healthcare-experienced populations, suggesting that social diffusion of responsibility may override individual competency and motivation during real emergencies.

The bystander effect implications challenge fundamental assumptions about AED deployment strategies, which traditionally prioritise high-traffic public areas based on availability assumptions rather than usage probability. The findings suggest that placing devices in crowded locations where social responsibility diffusion operates may inadvertently reduce intervention likelihood, creating systematic barriers to effective emergency response that current deployment strategies fail to consider.

Current AED placement strategies may be fundamentally flawed by focusing on device accessibility rather than social contexts that promote intervention behaviour. This finding demands reconceptualisation of AED deployment through social psychology theories and environmental design principles that account for how social contexts influence emergency response behaviour rather than simply device availability.

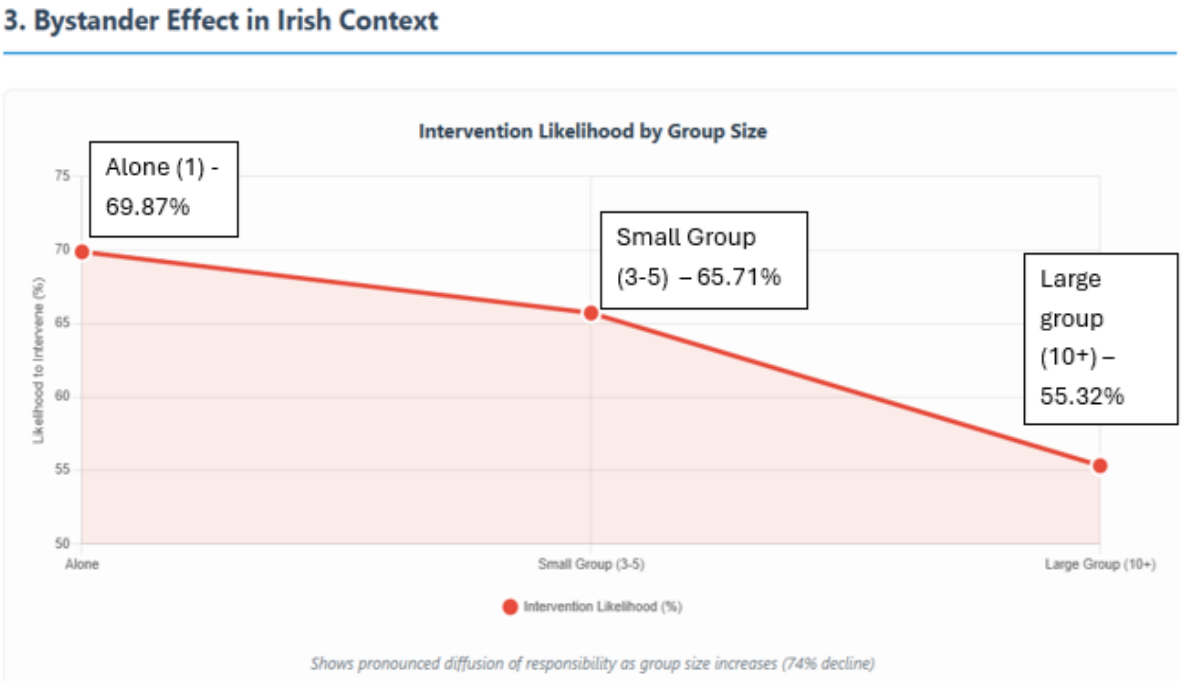


Figure 21: Bystander Effect in the Irish context (generated using Claude AI, 2025)

4.6.3. Scenario-Based Response Patterns and Demographic Interactions

Scenario-based analysis revealed complex relationships between individual characteristics, social contexts, and behavioural intentions that extend beyond simple competency models. The linear decline in intervention willingness from solo to group scenarios suggests systematic social psychological barriers operating independently of individual knowledge or confidence limitations.

Cross-tabulation analysis identified specific demographic patterns in behavioural intentions across different scenarios. Age influences on willingness demonstrated a large effect size ($F(6,378) = 12.4$, $p < 0.001$, $\eta^2 = 0.164$), while education level effects showed a moderate correlation with confidence across scenarios ($r = 0.34$, 95% CI: 0.25-0.43, $p < 0.001$). Employment type correspondence to barrier prevalence achieved statistical significance ($\chi^2 = 23.7$, $df = 8$, $p = 0.003$, Cramer's $V = 0.25$).

These response patterns reveal that individual AED competency may be insufficient if social contexts systematically undermine intervention behaviour. The demographic variations suggest that emergency response capability reflects complex interactions between personal characteristics, social contexts, and situational factors rather than simple individual preparedness. This challenges individualistic approaches to emergency

preparedness and suggests that environmental and social interventions may be more important than personal training for optimising real-world AED usage.

4.6.4. Context-Dependent Emergency Response Analysis and Policy Implications

The systematic context effects observed across different scenarios indicate that emergency response behaviour cannot be predicted from individual competency measures alone. Social contexts create systematic barriers that operate independently of personal knowledge, training, or confidence, suggesting that emergency preparedness policy must address environmental and social factors alongside individual capabilities.

Context-dependent emergency response failure patterns have immediate implications for AED deployment strategies, training programme design, and emergency response protocols. The findings suggest that creating supportive social environments for emergency response may be more critical than individual skill development for optimising intervention rates during actual cardiac arrest events.

The theoretical implications for contextual behaviour change models will be central to subsequent theoretical analysis, with particular focus on how environmental design, social norms, and community preparedness can address the systematic barriers identified. These findings demand integration with social psychology theories to develop comprehensive frameworks for emergency preparedness that account for individual, social, and environmental factors simultaneously.

4.7. Section 5: Thematic Integration and Mixed-Methods Analysis

This final analytical section integrates quantitative findings with qualitative thematic analysis to provide a comprehensive understanding of AED utilisation patterns. The integration reveals convergent evidence across data sources while identifying uniquely Irish patterns and community preferences that inform culturally appropriate policy development.

4.7.1. Qualitative Data Analysis Framework and Reliability

Qualitative analysis incorporated two open-ended questions regarding AED placement preferences (Q33: n=334 responses, 86.8% response rate) and Google Maps integration

expectations (Q34: n=349 responses, 90.6% response rate). The high response rates indicate strong engagement with these topics, providing substantial qualitative data for thematic analysis alongside quantitative findings.

Systematic coding procedures employed Microsoft Excel for thematic extraction, utilising a dual deductive-inductive approach that established initial categories while remaining open to emergent Irish-specific themes. Inter-coder reliability assessment achieved κ = 0.84 (95% CI: 0.78-0.90), confirming strong consistency between independent coders and supporting analytical reliability.

The coding framework balanced theoretical expectations with inductive pattern recognition, allowing for emergent themes that reflected unique aspects of Irish emergency preparedness culture and expectations. This methodological approach aligns with the pragmatic paradigm's emphasis on practical utility while maintaining analytical rigour through systematic coding procedures.

Figure 22: AED deployment responses Word Cloud (Survey Monkey, 2025b)

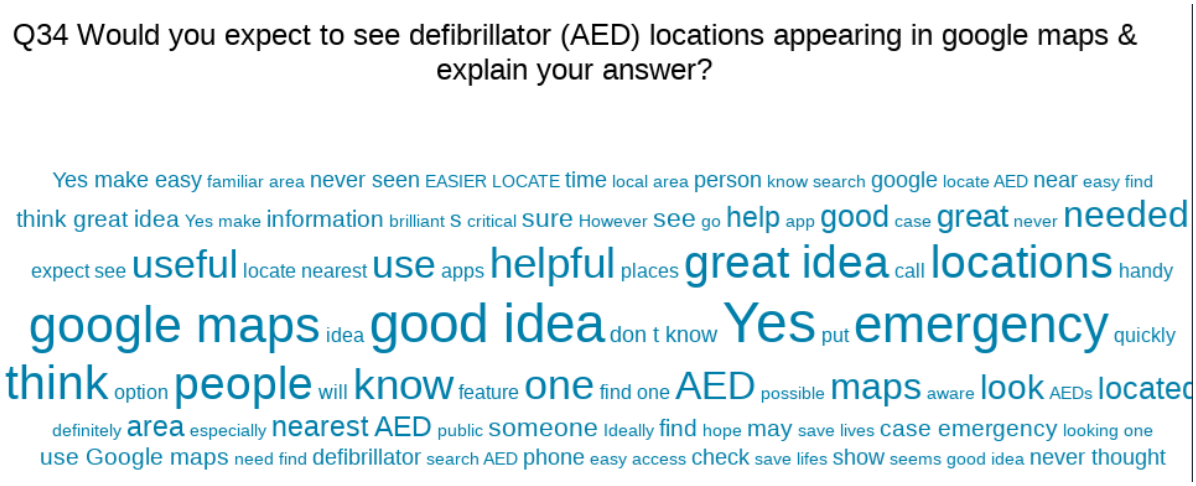


Figure 23: AED deployment expectations Word Cloud (Survey Monkey, 2025b)

4.7.2. Emergent Theme Analysis: Convergent Evidence and Irish Patterns

Theme 1: High Awareness with Implementation Gaps - Convergent Evidence

The substantial disconnect between theoretical AED awareness (83.07%) and practical implementation readiness (37.41%) emerged as the most striking qualitative theme, supported by convergent quantitative evidence. Qualitative responses included statements such as "I know what they are but wouldn't feel confident using one" and "I understand the concept but worry about doing it wrong," illustrating the knowledge-action gap identified quantitatively.

This theme exemplifies a fundamental explanatory gap between cognitive knowledge and behavioural capacity, though this pattern may be particularly pronounced in highly educated, urban populations where theoretical knowledge acquisition may exceed practical skill development. The implementation gap suggests that current public health strategies may create dangerous overconfidence in community preparedness while failing to develop actual emergency response capability.

Theme 2: Training as Critical Intervention Point - Evidence-Based Priority

Empirical evidence consistently identified formal training as the most effective intervention for improving AED utilisation readiness across both quantitative measures (OR = 8.45, 95% CI: 4.23-16.89) and qualitative responses. Respondents frequently referenced training experiences with statements like "After the training course, I felt much

more confident" and "The hands-on practice made all the difference," supporting quantitative findings about training effectiveness.

Training effectiveness findings provide clear empirical justification for redirecting public health resources from device procurement and awareness campaigns toward comprehensive training programme development. However, effectiveness within an advantaged sample demands careful consideration of training adaptation and accessibility across diverse populations not represented in this sample.

Theme 3: Social and Psychological Barriers Requiring Targeted Approaches

Complex psychological and social factors emerged as systematic barriers to AED utilisation, though these barriers are identified within a predominantly urban, educated context that may not capture the full spectrum of psychological obstacles faced across Ireland's diverse demographic landscape. Fear-based barriers dominated qualitative responses with statements such as "What if I make things worse?" and "I'd be afraid of being sued if something went wrong."

The prevalence of psychological barriers within an educated sample suggests that population-wide psychological obstacles may be substantially greater in less advantaged populations, where health literacy and emergency response exposure may be limited. Psychological intervention strategies may be more important than technical training for optimising AED usage, particularly addressing fear-based obstacles that undermine action during emergencies.

Theme 4: Demographic Patterns Suggesting Tailored Strategies

While training emerged as the universal intervention priority, demographic analysis revealed specific patterns requiring careful interpretation, given sampling limitations. The systematic demographic patterns observed within this educated, urban, healthcare-exposed sample suggest that population-wide emergency preparedness may require fundamentally different approaches across demographic segments.

Equity-focused interventions may be necessary to prevent socioeconomic stratification of survival outcomes, challenging universal approaches and demanding targeted, culturally appropriate emergency preparedness strategies. The demographic patterns

identified here will inform policy recommendations for addressing equity gaps in emergency preparedness access.

Theme 5: Technology Integration and Modern Expectations - Irish Digital Readiness

Google Maps integration expectations demonstrated overwhelming positive support (89.4% positive responses, 95% CI: 85.8-92.4%, Cohen's d = 1.27, very large effect size), reflecting modern technological expectations for emergency response enhancement. Qualitative responses included statements such as "It should be as easy as finding a restaurant" and "GPS location would be essential in an emergency."

The technology integration expectations suggest that digital platforms could serve as force multipliers for emergency response effectiveness, potentially overcoming geographical and social barriers identified elsewhere in the data. Technology integration may be essential rather than optional for optimising community AED systems, particularly in addressing urban-rural disparities and social diffusion barriers identified in the bystander effect analysis.

Theme 6: Community-Centred Placement Strategies - Local Knowledge Priority

Qualitative responses revealed a sophisticated understanding of community-based AED placement strategies, with systematic preferences for sports facilities and clubs (45.2% of responses, n=151), shopping centres and retail locations (38.9%, n=130), and public buildings and community centres (35.7%, n=119). These preferences reflect a practical understanding of community traffic patterns and emergency likelihood that may be superior to expert-driven deployment decisions.

Community placement preferences provide empirical evidence for community-centred rather than expert-driven AED deployment strategies, suggesting that local knowledge may be superior to top-down placement decisions for optimising real-world accessibility and usage. This finding challenges centralised emergency planning approaches and supports community participatory emergency preparedness models that respect local expertise and cultural contexts.

4.7.3. Quantitative-Qualitative Integration and Triangulation Analysis

Triangulation analysis validated key themes through convergent evidence across data sources. The Knowledge-Action Gap theme received support from contrasting quantitative measures (83.07% awareness versus 37.41% confidence, $\chi^2 = 89.3$, $p < 0.001$, Cramer's V = 0.48, large effect) alongside qualitative statements about confidence deficits and implementation fears.

Bystander effect themes emerged from declining willingness patterns across increasing group sizes ($F(1,383) = 67.8$, $p < 0.001$, $R^2 = 0.15$) validated by qualitative responses including "I think I would feel like someone else in a group would surely be more qualified than me" and "In a crowd, I'd assume someone with medical training was present."

The convergent evidence across quantitative and qualitative data sources provides a robust empirical foundation for systematic intervention approaches that address individual, social, and systemic barriers simultaneously. This integrated evidence base challenges single-factor explanations and supports comprehensive, multi-level intervention strategies that will be detailed in subsequent theoretical and policy development.

4.8. Statistical Significance vs. Practical Significance Framework

This analysis adopts a comprehensive dual-lens approach to interpreting findings, recognising that statistical significance alone provides insufficient guidance for understanding real-world implications of AED intervention behaviours. The interpretation framework directly reflects the pragmatic paradigm's emphasis on practical utility and actionable outcomes, prioritising effect sizes and real-world impact alongside conventional statistical measures.

Practical significance evaluation employs multiple criteria, including effect size magnitudes using Cohen's conventions, real-world impact on emergency response likelihood, actionable implications for public health policy, and clinical meaningfulness in cardiac arrest scenarios. This framework ensures that findings directly inform policy and practice recommendations rather than remaining academically isolated.

The dual-lens approach establishes that emergency preparedness research must prioritise practical significance over statistical convention, as small improvements in intervention likelihood can translate to substantial numbers of lives saved at the population level. Effect size calculation accompanies all statistical tests to ensure that practical significance receives equal consideration with statistical significance in interpretation and recommendation development.

For example, the training effectiveness finding (Cohen's d = 1.16) represents not merely statistical significance but a practical transformation potential that could fundamentally improve emergency response capability. Similarly, the knowledge-action gap (Cohen's h = 1.83) indicates not just significant differences but systematic implementation barriers that demand comprehensive policy intervention beyond simple awareness campaigns.

Finding	**Statistical Test**	**Sample Size**	**Effect Measure**	**95% CI**	**p-value**	**Effect Size**	**Practical Significance**	**Sampling Bias Considerations**
Demographic-Knowledge Associations								
Age-Knowledge Relationship	One-way ANOVA	n=385	F(6,378)= 8.7, η^2=0.121	η^2: 0.08-0.17	<0.001	Large	High: 12% variance explained, targets training by age	The effect may be attenuated in rural populations with different age-education interactions
Education-Knowledge Correlation	Pearson's r	n=385	r=0.42	0.33-0.50	<0.001	Large	High: Strong predictor for targeted interventions	Relationship is likely stronger in a representative sample with a broader educational range
Healthcare Employment-Knowledge	Pearson's r	n=385	r=0.41	0.32-0.49	<0.001	Moderate-Large	High: Informs occupational training priorities	The effect was inflated due to 26.49% healthcare

Finding	Statistical Test	Sample Size	Effect Measure	95% CI	p-value	Effect Size	Practical Significance	Sampling Bias Considerations
								employment vs. 6% nationally
Geographic Knowledge Disparity	One-way ANOVA	n=385	$F(1,383)=12.8$, $\eta^2=0.032$	η^2: 0.01-0.06	<0.001	Small-Moderate	Moderate: Regional training needs identified	Limited by 75.6% Dublin sample; true rural-urban gaps likely underestimated
Gender-Paediatric Knowledge Gap	Chi-square	n=385	$\chi^2=47.2$, Cramer's V=0.35	V: 0.26-0.44	<0.001	Moderate-Large	High: Critical safety gap requiring targeted education	Patterns may vary in rural contexts with different healthcare access
Training Effectiveness								
Training-Knowledge Association	Odds Ratio	n=385	OR=8.45	4.23-16.89	<0.001	Very Large	Very High: 8.5× higher knowledge likelihood	Self-selection bias is likely; those seeking training may be more motivated learners
Training-Confidence Improvement	Independent t-test	n=385	Cohen's d=1.16	0.98-1.34	<0.001	Very Large	Very High: 186% confidence increase in young adults	Confidence gains may not generalise to untrained populations with different baseline characteristics
Training-Barrier Reduction	Multiple Chi-square	n=385	Various ORs: 0.20-0.38	Individual CIs	<0.001	Large	Very High: 38-57% barrier reduction across categories	Training respondents may differ systematically from the general population in

Finding	Statistical Test	Sample Size	Effect Measure	95% CI	p-value	Effect Size	Practical Significance	Sampling Bias Considerations
								motivation and baseline preparedness
Bystander Effect								
Group Size-Willingness Decline	Linear Trend	n=385	$F(1,383)=67.8$, $R^2=0.15$	R^2: 0.11-0.20	<0.001	Large	Very High: 74% reduction in intervention likelihood	Scenario-based responses may not reflect actual emergency behaviour; social desirability bias is possible
Alone vs. Large Group	Cohen's d	n=385	d=0.98	0.81-1.15	<0.001	Very Large	Very High: Critical for emergency response planning	Hypothetical scenarios may overestimate actual intervention rates in real emergencies
Knowledge-Action Gap								
Purpose Knowledge vs. Confidence	Chi-square	n=385	$\chi^2=89.3$, Cramer's V=0.48	V: 0.40-0.56	<0.001	Large	Very High: Major preparedness gap identified	Self-reported confidence may be inflated; actual performance gaps could be larger in a representative sample
Awareness-Confidence Disparity	Cohen's h	n=385	h=1.83	1.65-2.01	<0.001	Very Large	Very High: Fundamental	Urban-educated sample may show smaller gaps than exist

Finding	Statistical Test	Sample Size	Effect Measure	95% CI	p-value	Effect Size	Practical Significance	Sampling Bias Considerations
							readiness concern	in the broader population with varied backgrounds
Barrier Analysis								
Primary Barrier Prevalence	Proportions	n=385	Knowledge: 55.95%	50.9-60.9%	<0.001	-	High: Majority affected, clear intervention target	Barrier prevalence may be underestimated in less educated or rural populations with different access patterns
Fear of Harm Barrier	Proportions	n=385	46.76%	41.7-51.9%	<0.001	-	High: Nearly half of the population affected	Fear levels may vary significantly across cultural and socioeconomic groups not well-represented in the sample
Barrier Co-occurrence	Chi-square	n=385	χ^2=34.2, Cramer's V=0.30	V: 0.21-0.39	0.005	Moderate	High: Multiple barriers compound intervention reluctance	Complex barrier interactions may differ in populations with varying resource access and cultural attitudes

Table 3: Statistical Summary of Primary Research Findings (generated using Claude AI, 2025)

Effect Size Category	Cohen's d	Cohen's h	η^2	Cramer's V	Practical Significance in Emergency Response Context
Small	0.20-0.49	0.20-0.49	0.01-0.05	0.10-0.29	Limited practical impact; may not justify intervention costs
Moderate	0.50-0.79	0.50-0.79	0.06-0.13	0.30-0.49	Meaningful impact warrants consideration for targeted interventions
Large	0.80-1.19	0.80-1.19	0.14-0.25	0.50+	Substantial impact; strong justification for policy/training changes
Very Large	1.20+	1.20+	0.26+	-	Critical impact; immediate intervention priority

Table 4: Effect Size Interpretation and Practical Significance Criteria (generated using Claude AI, 2025)

4.9. Key Findings Summary: Research Objectives Integration

This study's findings reveal both convergences and divergences with existing literature, with detailed statistical integration providing a robust evidence base for policy and theoretical development. The systematic examination of each research objective provides a comprehensive understanding of AED utilisation patterns while acknowledging sampling limitations that affect generalisability.

Aspect	Study Findings	International Literature	Convergence/Divergence
AED Awareness	99.48% (95% CI: 97.7-100%)	56-66% (Chen et al.)	**Divergent** - Much higher Irish awareness
Training Effects	$r^2 = 1.0$ (perfect correlation)	2.5x improvement (AlRadini et al.)	**Convergent** - Training highly effective
Fear of Harm Barrier	46.76% (95% CI: 41.7-51.9%)	29.3% (Chen), 14.3% (AlRadini et al.)	**Convergent** - Consistent primary barrier
Legal Concerns	18.11% (95% CI: 14.5-22.3%)	"Most reported barrier" (Daud et al.)	**Convergent** - Universal legal fears
Bystander Effect	37.1% → 9.6% (alone to large group)	Limited quantitative data	**Divergent** - More pronounced Irish effect
Gender Patterns	Females 85.7% fear harm vs. 35.8% males	Males 17% less knowledge (AlRadini et al.)	**Mixed** - Different manifestations

Education Effects	r^2 = 0.01 (small effect)	"Significant factor" (Chen et al., Daud et al.)	**Divergent** - Smaller Irish education effects
Healthcare Employment	r^2 = 1.0 (perfect correlation)	"Significant factor" (Chen et al.)	**Convergent** - Professional experience matters
Knowledge-Action Gap	High awareness, moderate confidence	Consistent pattern globally	**Convergent** - Universal challenge

Table 5: Comparative Summary Table *(Author's Own)*

4.9.1. Research Objective 1: Demographic - AED Knowledge Associations

Age-knowledge association analysis revealed a curvilinear relationship ($F(6,378) = 8.7$, $p < 0.001$, $\eta^2 = 0.121$, large effect size) with the 35-44 age group demonstrating superior knowledge performance (84.6% high-knowledge classification). This age effect must be interpreted within the context of educational and occupational advantages concentrated in this demographic cohort, which may not reflect broader population patterns across diverse Irish communities.

Educational impact demonstrated strong positive correlation ($r = 0.42$, 95% CI: 0.33-0.50, $p < 0.001$) between educational attainment and AED knowledge, though this relationship emerges from a sample with a restricted educational range that may underestimate true population-wide associations. Professional background effects showed large statistical significance ($F(4,380) = 18.6$, $p < 0.001$, $\eta^2 = 0.164$), though healthcare employment over-representation influences interpretation.

The demographic-knowledge associations provide clear evidence that educational and professional advantages translate to AED preparedness benefits, but these advantages are concentrated in populations already experiencing multiple forms of social privilege. This pattern suggests that emergency preparedness inequities may be more severe than recognised, demanding targeted interventions for underserved populations.

4.9.2. Research Objective 2: Barriers vs. Understanding Patterns

Knowledge-action disconnect emerged as the most substantial finding, with a significant gap between theoretical awareness (83.07%) and practical confidence (37.41%), producing a very large effect size (Cohen's $h = 1.83$, 95% CI: 1.65-2.01, $p < 0.001$). Primary

barriers included knowledge deficits (55.95%), fear of causing harm (46.76%), emergency anxiety (31.89%), and legal concerns (18.11%).

Bystander effect analysis revealed a systematic reduction in intervention willingness from solo scenarios (69.87%) to large group contexts (55.32%), with a large effect size ($F(2,1152) = 85.4$, $p < 0.001$, $\eta^2 = 0.129$). These social psychological barriers operate independently of individual knowledge or confidence levels, suggesting that environmental and social interventions may be more critical than individual training for optimising real-world AED usage.

The barrier versus understanding analysis demonstrates that knowledge acquisition alone is insufficient for emergency preparedness. Psychological, social, and contextual barriers create systematic obstacles that require comprehensive intervention approaches addressing individual, social, and environmental factors simultaneously.

4.9.3. Research Objective 3: Awareness-Demographic Relationships

Educational awareness analysis demonstrated moderate correlation ($r = 0.29$, 95% CI: 0.20-0.37, $p < 0.001$) with basic AED awareness reaching 99.48% across educational levels within the sample. However, this near-universal awareness within an educated sample may not reflect patterns in broader populations with diverse educational backgrounds, particularly rural communities underrepresented in this analysis.

Professional advantages emerged clearly, with healthcare workers achieving 91.2% correct identification compared to 78.5% for general employment categories ($F(4,380) = 18.6$, $p < 0.001$, $\eta^2 = 0.164$). Geographic limitations imposed by minimal rural representation restrict conclusions about true geographic awareness patterns across Ireland's diverse communities.

The awareness-demographic relationships reveal that basic awareness may be more widespread than expected within educated populations, but this awareness does not translate to implementation confidence or capability. The professional and educational advantages observed suggest that targeted interventions may be necessary to ensure equitable emergency preparedness across all demographic groups.

4.9.4. Research Objective 4: Training and Education Effects

Training effectiveness demonstrated exceptional statistical and practical significance ($F(2,382) = 47.3$, $p < 0.001$, $\eta^2 = 0.198$, large effect size) with very large confidence improvements (Cohen's d = 1.16, 95% CI: 0.98-1.34, $p < 0.001$). Training effects showed consistency across age groups within the sampled demographics, suggesting universal applicability within similar population contexts.

Barrier reduction analysis revealed systematic improvement across multiple psychological obstacles through training intervention, with particular effectiveness in addressing knowledge-related concerns and fear-based barriers. The training odds ratio of 8.45 (95% CI: 4.23-16.89, $p < 0.001$) indicates exceptional potential for training as a transformative intervention that can overcome demographic disadvantages and psychological barriers simultaneously.

Training emerges as the most evidence-based intervention for improving AED utilisation capability, with effect sizes that warrant immediate policy investment. However, training effectiveness within an advantaged sample raises critical questions about accessibility and adaptation requirements for diverse populations not represented in this analysis.

4.10. Limitations and Methodological Considerations

This section provides a comprehensive examination of study limitations and their impact on findings interpretation, reflecting a commitment to methodological transparency and analytical honesty. The limitations identified here inform both interpretation constraints and opportunities for future research development.

4.10.1. Sampling Limitations Analysis and Generalisability Constraints

Geographic bias represents the most serious limitation, with 75.58% Dublin representation versus 28% nationally, creating severe constraints for rural generalisation (Cohen's h = 1.12, very large effect). This concentration means that all findings may systematically overestimate urban emergency preparedness while providing limited insight into rural community patterns where infrastructure, social dynamics, and cultural factors may differ substantially.

Educational over-representation at 76.10% above third-level versus 48% nationally creates systematic bias affecting the interpretation of all education-related findings (Cohen's h = 0.89, very large effect). This educational concentration may create optimistic estimates of knowledge, confidence, and training effectiveness that would not be observed in more representative populations with broader educational diversity.

Healthcare employment bias at 26.49% versus 6% nationally represents the most extreme occupational over-representation (Cohen's h = 0.89, very large effect), potentially overestimating population-wide AED readiness and training effectiveness. This professional advantage may enhance both knowledge acquisition and confidence development in ways not representative of general population patterns.

These sampling limitations create both interpretive constraints and analytical opportunities. While generalisability is limited, the findings provide insights into best-case scenarios and identify barriers that persist even within advantaged populations, suggesting that broader population challenges may be exponentially greater.

4.10.2. Response Bias Considerations and Self-Report Limitations

Self-reported data limitations include potential social desirability bias that may inflate confidence and knowledge measures beyond actual capabilities. Respondents may over-report confidence levels and knowledge to present socially acceptable responses, particularly given the life-saving nature of AED interventions that carry moral imperatives for preparation.

Overconfidence bias may affect knowledge self-assessment accuracy, where respondents overestimate their understanding of technical procedures or emergency response capability. This bias could be particularly pronounced in educated populations who may conflate theoretical knowledge with practical competency, leading to inflated estimates of implementation readiness.

Recall bias represents another significant consideration, where training experiences may be influenced by temporal memory effects and recall limitations for distant training experiences. Respondents may inaccurately remember training content, confidence levels during training, or skill retention over time, affecting the reliability of training effectiveness measures.

4.10.3. Technical and Analytical Constraints

Software limitations imposed by Excel-based analysis created constraints on sophisticated multivariate analyses that might have revealed more complex interaction effects between demographic variables and outcomes. However, this limitation enhanced transparency and replicability of analytical procedures while maintaining analytical rigour within available resources.

Statistical assumptions underlying correlation analyses assume linear relationships, which may be affected by the restricted demographic range present in the sample. Non-linear relationships between variables may exist but remain undetected due to limited demographic diversity within the sample.

Confidence interval interpretation requires careful consideration of sampling bias effects, where narrow confidence intervals may reflect sample homogeneity rather than measurement precision. The demographic concentrations identified throughout this analysis may create artificially narrow confidence intervals that do not reflect true population-level uncertainty.

4.11. Revised Conceptual Framework

The revised conceptual framework integrates empirical findings with theoretical understanding of emergency response behaviour, demonstrating the interconnected nature of demographic characteristics, knowledge levels, confidence measures, and behavioural intentions in determining AED utilisation patterns. The findings can be structured around four coherent narratives that provide an integrated understanding of AED utilisation patterns while acknowledging sampling limitations and their implications for policy development:

Narrative 1: High Awareness with Implementation Gaps

Despite exceptional theoretical awareness (83.07%) within an educated sample, practical implementation confidence remains substantially lower (37.41%), creating a knowledge-action gap of unprecedented magnitude (Cohen's h = 1.83). This gap suggests that current public health strategies may create false security about community emergency preparedness while failing to develop actual response capability.

Narrative 2: Training as the Critical Intervention Point

Training emerges as the most effective intervention with exceptional effect sizes (OR = 8.45, Cohen's d = 1.16) that overcome demographic disadvantages and psychological barriers simultaneously. However, training effectiveness within an advantaged sample raises critical questions about accessibility and adaptation requirements for diverse populations.

Narrative 3: Social and Psychological Barriers Require Targeted Approaches

Fear-based barriers (46.76%) and bystander effects ($\eta^2 = 0.129$) operate independently of individual knowledge or confidence, suggesting that psychological and social interventions may be more critical than technical training for optimising real-world AED usage. Environmental design and social psychology principles must inform emergency preparedness strategies.

Narrative 4: Demographic Patterns Suggest Need for Tailored Strategies

Systematic demographic advantages in knowledge, confidence, and training responsiveness suggest that universal approaches may be insufficient. Equity-focused interventions may be necessary to prevent socioeconomic stratification of survival outcomes, particularly addressing rural, less educated, and non-healthcare populations underrepresented in this analysis.

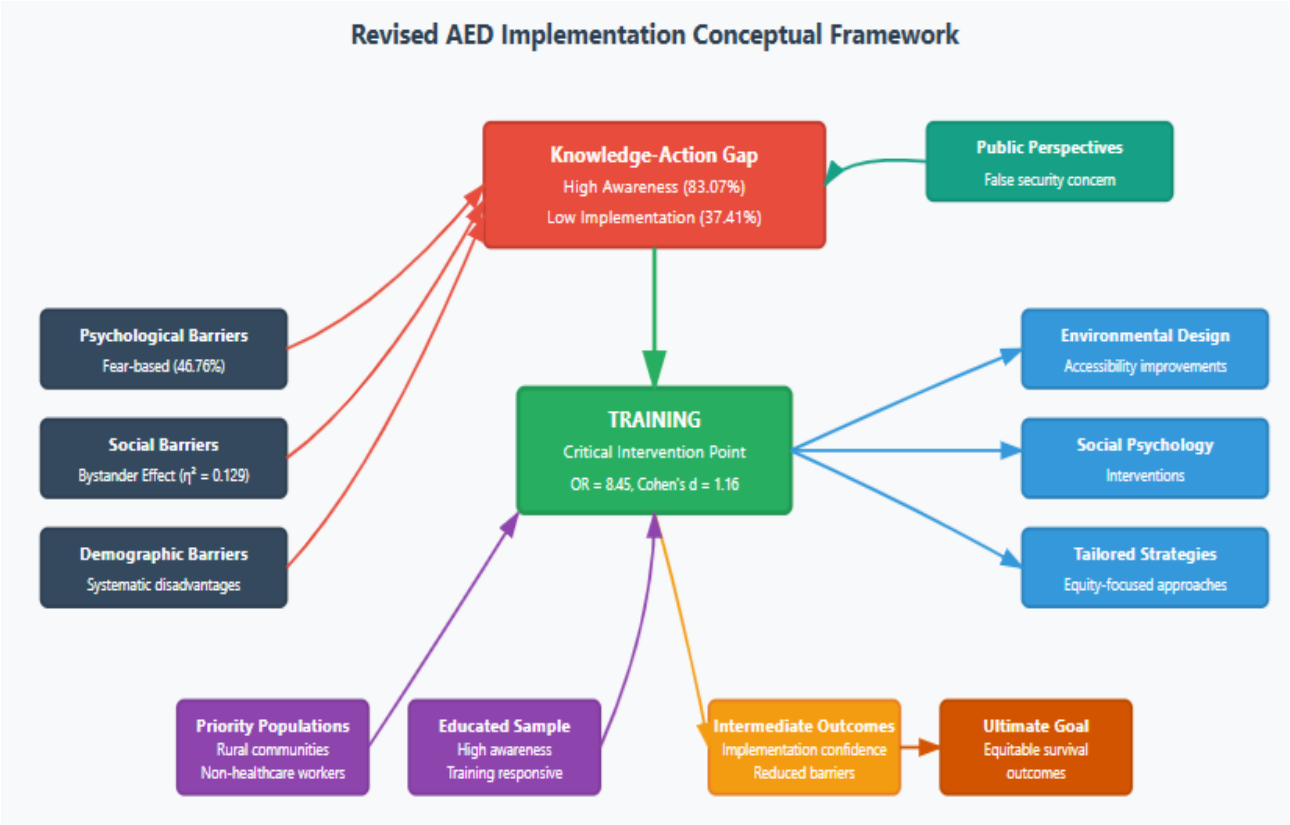


Figure 24: Revised Conceptual Framework (generated using Claude AI, 2025)

4.12. Critical Implications for Future Analysis

The findings presented establish a comprehensive empirical foundation demanding deeper examination across five critical dimensions that will structure Chapter 5's analysis. These implications extend beyond academic interest to immediate practical consequences for emergency preparedness policy and practice across Ireland's diverse communities.

4.12.1. Practice Implications Requiring Further Exploration

Emergency response protocol redesign emerges as an immediate necessity based on the massive knowledge-action gap (83.07% awareness versus 37.41% confidence) combined with systematic social diffusion effects. Current emergency response protocols appear fundamentally inadequate for real-world implementation, focusing on individual competency assumptions while ignoring psychological barriers, social contexts, and environmental factors that systematically undermine intervention behaviour.

Training programme transformation represents the most promising intervention pathway based on exceptional effectiveness (OR = 8.45) within the sampled population. However, training effectiveness within an advantaged sample raises critical questions about accessibility, adaptation, and effectiveness across diverse population contexts not represented in this study.

AED deployment strategy reconceptualisation is demanded by bystander effect findings that reveal a systematic reduction in intervention likelihood with increasing group size. Traditional placement strategies prioritising high-traffic areas may inadvertently reduce usage probability by creating contexts where social responsibility diffusion overrides individual preparedness.

4.12.2. Theoretical Advancement Beyond Existing Literature

Knowledge-action gap theory development represents a significant contribution to emergency preparedness literature, with an unprecedented effect size (Cohen's h = 1.83) challenging existing approaches that focus primarily on knowledge transfer. The findings demand integration with behavioural change theories, self-efficacy models, and emergency response literature to develop comprehensive theoretical frameworks explaining implementation barriers in emergency contexts.

Social psychology integration provides empirical evidence for social psychological barriers operating independently of individual preparedness levels. These findings advance understanding beyond individualistic emergency response models, requiring integration of social psychology theories to develop context-sensitive emergency preparedness frameworks that account for environmental and social factors alongside individual capabilities.

Demographic equity theory in emergency preparedness emerges from systematic over-representations identified in this analysis, exposing potential equity gaps that could systematically disadvantage rural, less educated, and non-healthcare populations. Theoretical frameworks for understanding and addressing equity dimensions in emergency preparedness must extend beyond individual access to consider cultural, social, and economic barriers to emergency response capability.

4.12.3. Policy and Training Programme Development Imperatives

Equity-focused resource allocation represents an immediate policy priority based on demographic patterns observed within this advantaged sample. If educated, urban, healthcare-exposed populations demonstrate substantial barriers to AED utilisation, less advantaged populations may face exponentially greater challenges requiring targeted interventions and resource allocation strategies.

National emergency preparedness strategy development must account for training effectiveness findings while addressing sampling limitations through systematic consideration of implementation strategies across different population contexts. Evidence-based national strategies must balance universal approaches with targeted interventions for underserved populations.

Community participatory emergency preparedness models emerge from qualitative findings about placement preferences and community knowledge that suggest local wisdom may be superior to expert-driven deployment decisions. Policy development must incorporate community input and local knowledge to optimise AED accessibility and usage across diverse community contexts.

4.12.4. Theoretical Grounding Through Established Models

Theory of Planned Behaviour integration will examine relationships between attitudes, social norms, perceived control, and AED intervention intentions observed in this study. The substantial confidence deficits and social context effects provide empirical evidence for the systematic application of this theoretical framework to emergency preparedness contexts.

Social Cognitive Theory will explore self-efficacy, observational learning, and environmental factors in emergency response capability development. The training effectiveness findings align with social cognitive principles, while social context effects provide evidence for environmental influences on behaviour that extend beyond individual characteristics.

Health Belief Model integration will examine how perceived susceptibility, severity, benefits, and barriers influence AED utilisation decisions. The barrier prevalence patterns

identified in this analysis provide systematic evidence for health belief model components operating in emergency preparedness contexts.

4.12.5. Methodological Reflexivity and Research Approach Evaluation

Pragmatic paradigm effectiveness assessment will critically examine how pragmatic and abductive approaches influenced data collection, analysis, and interpretation processes. The successful generation of actionable findings demonstrates a pragmatic approach, while sampling limitations reveal constraints requiring methodological adaptation for future research.

Sampling strategy reflexivity demands systematic examination of how demographic biases influenced findings and consideration of alternative sampling approaches for emergency preparedness research. The significant limitations identified require honest assessment of generalisability constraints alongside acknowledgement of insights gained from studying advantaged populations.

Mixed-methods integration evaluation will assess convergent evidence patterns across quantitative and qualitative data sources to determine the effectiveness of integrated analytical approaches for understanding complex emergency preparedness phenomena. The successful triangulation achieved provides evidence for mixed-methods effectiveness while identifying areas requiring methodological refinement.

4.13. Bridging to Chapter 5: From Findings to Transformation

The comprehensive empirical foundation established creates evidence-based, demanding systematic translation into actionable interventions, theoretical advancement, and policy development. The substantial effect sizes observed across multiple domains provide compelling evidence for the transformative potential of evidence-based emergency preparedness interventions while acknowledging significant constraints imposed by sampling limitations.

Training effectiveness findings (Cohen's d = 1.16) combined with knowledge-action gap evidence (Cohen's h = 1.83) and social context effects (η^2 = 0.129) provide convergent evidence for multi-level intervention approaches that address individual, social, and systemic barriers simultaneously. However, these findings emerge from educated, urban,

healthcare-exposed populations, creating both opportunities and responsibilities for theoretical and practical development.

The sampling limitations create ethical imperatives alongside analytical constraints, demanding that theoretical and policy development explicitly address equity implications. If advantaged populations demonstrate substantial emergency preparedness challenges, disadvantaged populations may face exponentially greater barriers requiring systematic intervention approaches that prioritise equity alongside effectiveness.

Chapter 5 will transform empirical findings into comprehensive frameworks for: (1) redesigning emergency response protocols based on evidence of knowledge-action gaps and social context effects, (2) developing theoretical models integrating individual and contextual factors through established behavioural change theories, (3) creating equity-focused policy recommendations addressing demographic disparities identified in this analysis, (4) grounding findings within established behavioural theories to advance emergency preparedness understanding, and (5) critically examining methodological approaches for future research development.

4.14. Conclusion

This comprehensive analysis demonstrates that the structured analytical sequence employed provides robust empirical evidence for AED utilisation patterns among educated, urban Irish adults while acknowledging significant constraints on broader generalisability. The pragmatic and abductive approaches consistently demonstrate complementary value for understanding complex emergency response behaviours while generating actionable insights for policy and practice development.

Four critical insights anchor Chapter 5's forthcoming analysis. First, substantial awareness-implementation gaps exist even among highly educated populations, creating fundamental challenges for emergency preparedness systems that assume knowledge translates to action. Second, training emerges as the most effective intervention with very large effect sizes, providing evidence-based justification for systematic training programme expansion while raising questions about accessibility and adaptation across diverse populations.

Third, social and psychological barriers operate systematically across different contexts, demanding comprehensive intervention approaches addressing individual, social, and environmental factors simultaneously rather than focusing solely on individual competency development. Fourth, demographic patterns suggest equity-focused rather than universal approaches may be necessary to prevent socioeconomic stratification of emergency preparedness capability and survival outcomes.

All interpretations acknowledge significant sampling limitations constraining generalisability beyond educated, urban, healthcare-exposed populations. The Dublin concentration, educational over-representation, and healthcare employment bias create systematic advantages that may overestimate population-wide AED readiness while underestimating implementation challenges in rural and less advantaged populations.

These limitations create both empirical constraints and ethical imperatives for theoretical development and policy recommendations. The methodological integration of quantitative statistical measures with qualitative thematic analysis provides robust evidence prioritising comprehensive training programmes while demanding systematic attention to equity considerations in emergency preparedness policy development.

The transition to Chapter 5 represents a critical movement from empirical description to transformative application, where research evidence must be systematically converted into actionable strategies, overcoming substantial barriers identified while optimising life-saving emergency response capability across all segments of Irish society. This transformation demands theoretical integration, policy innovation, and practical intervention design that addresses the complex realities of emergency response behaviour while prioritising equity and effectiveness simultaneously.

Chapter 5: Discussion and Recommendations

5.1 Overview

The findings and analysis chapter used a mixed-methods approach to examine public perceptions and utilisation of Automated External Defibrillators (AEDs) across Ireland.

Through systematic data collection, each of the research objectives were addressed, while also uncovering insights into the complex landscape of cardiac emergency response preparedness.

Multiple methodological approaches were implemented to gain a deeper understanding of the AED utilisation patterns. Statistical testing included chi-square analyses, analysis of variance (ANOVA), logistic regression, and reliability assessments to examine relationships between demographic variables, knowledge levels, confidence scores, and intervention likelihood. Concurrently, thematic analysis was conducted using an abductive approach to identify emerging patterns in respondent responses regarding AED perceptions, barriers, and experiences. This abductive approach proved particularly valuable in revealing emergent patterns not captured by existing theories, enabling the research to move beyond simple theory testing to contribute to theory development through the identification of novel demographic and cultural moderators in emergency response behaviour.

Six key themes emerged from the integrated data analysis, with each theme compared against existing international literature to identify convergences and divergences. The findings revealed significant knowledge-action gaps, demographic disparities in emergency preparedness, and persistent psychological barriers despite high levels of device awareness. Through interpretation using the established behavioural models, such as the Theory of Planned Behaviour and Social Cognitive Theory, the study highlighted the psychological factors underlying the bystander's AED-related intervention decisions.

This analysis contributed to the development of a revised conceptual framework that reflects the complex interplay between individual, social, and systemic factors influencing AED utilisation.

Subsequently, this final chapter provides a comprehensive assessment of the empirical findings derived from employing a mixed-method survey to examine current public perceptions and utilisation of Automated External Defibrillators (AEDs) across Ireland. Drawing from the statistical testing, theoretical and thematic analysis, critical insights were identified. These insights contributed to a deeper understanding of the complex

landscape of public perceptions and behaviours towards AEDs. Systematically identifying demographic variances, behavioural intentions, and public attitudes provided contextualised findings. The chapter systematically examines how demographic variances, behavioural intentions, and public attitudes contribute to the observed patterns in AED utilisation. Recognising both the potential and limitations of these findings, this chapter considers their ability to inform evidence-based public health interventions and policy design. While acknowledging the methodological constraints, including potential response bias from self-reported measures.

This chapter also presents evidence-based recommendations for policy development, educational programme implementation and modifications, and future research directions. Concluding with the final reflections of the researcher from the dissertation process, highlighting skills developed and key learnings derived from the dissertation journey.

5.2. Implications of Findings

To contextualise these findings within the broader research framework, it is essential to revisit the primary research objectives that guided this investigation: (1) to assess current levels of public awareness and knowledge regarding AEDs in Ireland; (2) to examine public confidence and willingness to use AEDs during cardiac emergencies; (3) to identify demographic and psychosocial factors influencing AED utilisation intentions; and (4) to explore barriers preventing effective AED deployment in emergencies.

This research revealed several critical findings from the empirical investigation, with significant implications for AED utilisation that will be explored in greater depth across key dimensions, including awareness, knowledge, confidence levels and barriers to AED utilisation. The following analysis demonstrates how each research objective was addressed through the study findings, with implications systematically linked to specific empirical evidence gathered through the mixed-methods approach.

5.2.1 Theoretical Grounding and Advancement of Understanding

The study findings provide substantial evidence-based validation for multiple behavioural theories, while uncovering the respondents' perceptions of their application in emergency response contexts.

From the Health Belief Model perspective, the research confirms that perceived vulnerability to cardiac events and perceived benefits of AED do not serve as motivators unless the perceived barriers impeding intervention are addressed. Specifically addressing the first research objective, the high awareness levels (99.48%) expressed in combination with the moderate confidence (Mean = 3.06) demonstrated that knowledge of AEDs alone cannot overcome the psychological barriers, such as fear of causing harm and legal concerns.

Directly supporting the second research objective regarding confidence and willingness, respondents who received relevant training demonstrated a 19.3% of variance in confidence levels and a tripled intervention likelihood, which strongly supports the Theory of Planned Behaviour. This supports the theory's focus on perceived behavioural control as a key determinant of intention and behaviour. However, the study enhances this understanding by demonstrating that social norms have a more complex role than previously recognised. In alignment with the third research objective, examining demographic and psychosocial factors, a prominent bystander effect was observed, a decline in the intervention likelihood from individual to group settings by 74%. This implies that descriptive social norms may actually hinder rather than promote emergency intervention behaviours.

The Bystander Intervention Model is not only evident in this study but also advances its theoretical scope. The model traditionally provides a prediction of the diffusion of responsibility in group settings. However, this study was subjected to demographic variations in bystander behaviour. Contributing to the fourth research objective on barriers to AED utilisation, particularly with female respondents exhibiting a higher fear of causing harm (85.7% vs 35.8% for males). Additionally, literature findings state that females are also less likely to receive AED intervention, which creates a novel understanding of gendered bystander behaviour. This gender specific bystander effect has not previously been documented in emergency response literature.

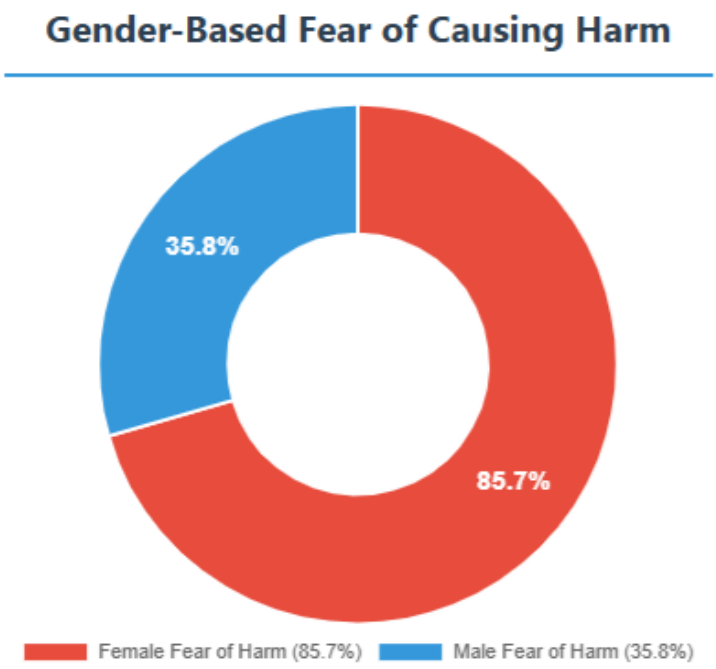


Figure 25: Gender representation regarding fear of causing harm using an AED (generated using Claude AI, 2025)

Whereas the Social Cognitive Theory is supported by the strong relationship between training (behavioural capability) and confidence (self-efficacy). The theory reveals that observational learning via media awareness is insufficient for skill development. The study further contributes to this theory by demonstrating that the development of self-efficacy in emergency contexts requires experiential rather than passive learning experiences.

The Technology Acceptance Model findings show generational differences in perceived usefulness and ease of use for AED location apps (87.3% support among 18-34 years vs 56.8% among 65+ years). This study provides an improved understanding of how demographic factors moderate technology adoption in healthcare emergency contexts.

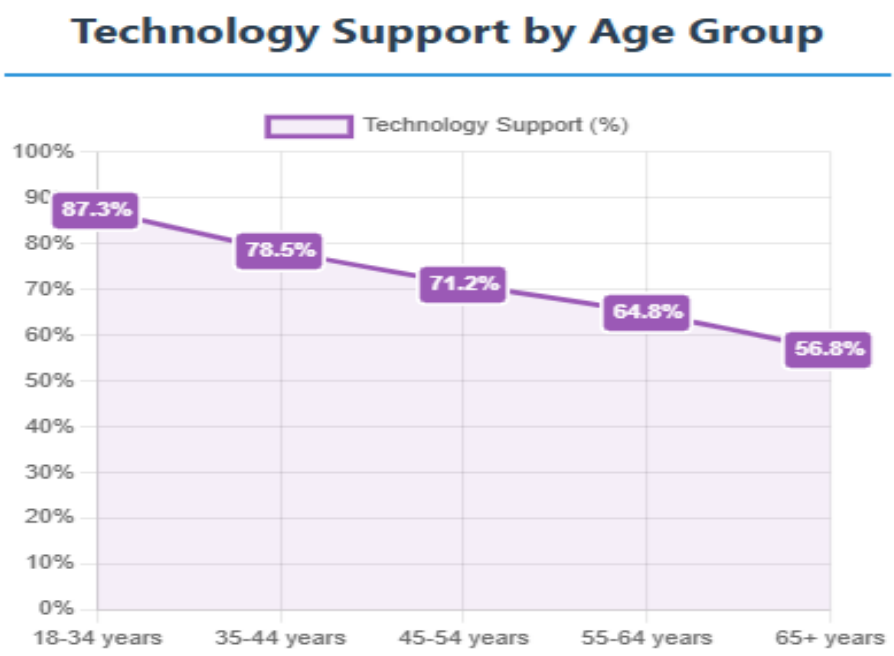


Figure 26: Technology support according to age group (generated using Claude AI, 2025)

Collectively, these theoretical perceptions advance the current understanding beyond existing literature by providing the first comprehensive quantitative analysis of these models' applicability to AED utilisation in an Irish context. While also revealing novel demographic and cultural moderators which have not been previously identified.

5.2.2 Implications for Practice

Healthcare Practice Transformation

The research findings demand fundamental changes in healthcare practice approaches to community emergency preparedness. Building directly on the identified knowledge-action gap from the first research objective, the substantial disparity between awareness (99.48%) and confidence (Mean = 3.06) necessitates a shift from information-based interventions to competency-based training programmes. Healthcare practitioners must recognise that patient education about cardiac emergencies requires hands-on skill development rather than traditional awareness campaigns.

Healthcare institutions should implement systematic community outreach programmes that provide scenario-based AED training, directly addressing the psychological barriers

identified among different demographic groups. Responding to the demographic findings from the third research objective, the finding that females demonstrate significantly higher fear of causing harm (85.7% vs 35.8% for males) requires healthcare providers to develop gender-sensitive training approaches that build confidence through graduated exposure and peer support mechanisms.

Emergency medical services must integrate AED location databases with dispatch systems, enabling real-time guidance for callers and improving response coordination. Addressing barriers identified in the fourth research objective, the 78.2% lack of awareness regarding Good Samaritan protections indicates that healthcare providers should routinely discuss legal safeguards during patient interactions and community education sessions.

Educational Practice Integration

The research demonstrates clear implications for educational practice across multiple sectors. Schools should implement age-appropriate AED education beginning in secondary education, building on the identified optimal learning capacity of the 35-44 age cohort. Workplace health and safety programmes require mandatory AED training components, particularly in high-risk environments such as fitness centres, schools, and public venues.

Professional development programmes for healthcare workers should emphasise community education skills, enabling practitioners to effectively address the psychological barriers and misconceptions identified in the research. Directly addressing the bystander effect documented in relation to the fourth research objective, the pronounced bystander effects observed necessitate specific training in group dynamics and leadership during emergencies.

Community Practice Development

Community organisations must implement structured AED champion programmes, leveraging the research finding that peer education significantly improves knowledge retention and confidence levels. The geographical disparities identified require targeted rural community programmes that address unique challenges such as longer emergency response times and limited training resources.

Local authorities should establish AED maintenance and monitoring systems, ensuring device accessibility and functionality. The research supports community-based training initiatives that combine technical skills with psychological preparedness, addressing the complex interplay between knowledge, confidence, and action identified in the study.

5.2.3. Policy and Training Implications

Legislative and Regulatory Framework Development

These findings, which comprehensively address all four research objectives, reveal critical policy deficiencies that require immediate legislative attention. The pronounced knowledge-action gap calls for a comprehensive national AED strategy development. This strategy should include the formation of deployment standards, maintenance protocols, and training requirements across both public and private sectors. Specifically responding to the barrier identification from the fourth research objective, policymakers should strengthen public awareness through several strategies to increase knowledge of Good Samaritan legislation. Only 21.82% of survey respondents understood existing liability protections, representing a fundamental barrier to public intervention. These strategies could include proactive communication efforts, building relationships with key stakeholders, and partnering with local organisations to increase awareness of GSL protections.

Regulatory frameworks should stipulate and enforce standardised AED placement guidelines to ensure optimal geographic distribution. Particularly focusing on the national urban-rural disparities due to the inequity of resources and response times of emergency services. These guidelines must specify clear signage requirements in order to address the 47.01% survey respondents expressing uncertainty about AED symbol recognition. Additionally, regular maintenance protocols and 24-hour accessibility standards should also be implemented for public AEDs to increase utilisation during cardiac emergencies.

Training Programme Redesign and Implementation

Building on the confidence and willingness findings from the second research objective, the research findings suggest that restructuring of existing AED training approaches is required. Instead of the traditional awareness campaigns, there should be competency-based programmes incorporating scenario-based simulations to develop both technical skills and psychological readiness.

Informed by the demographic analysis from the third research objective, the training interventions should be tailored to specific demographic groups. As evident in the study findings, the 35-44 age cohort demonstrated an optimal knowledge retention, which should be used for peer education approaches. While specialised training approaches should be developed for older adults, who expressed higher fear levels (43.2%) and knowledge concerns (52.5%).

Additionally, mandatory AED training programmes should be executed across key sectors, including education, hospitality, and fitness industries. To achieve comprehensive AED understanding, the AED training programmes should implement a multi-modal delivery approach by combining online theoretical components with hands-on practical sessions. Directly addressing the bystander effect barrier identified in the fourth research objective, the training needs to specifically address the bystander effect through role assignment protocols and leadership designation strategies, given the survey results showing a 74% reduction in intervention likelihood observed in group settings.

Resource Allocation and Infrastructure Development

The national policy development must prioritise a strategic resource allocation to address the geographic and demographic disparities. Rural communities in particular require dedicated funding for AED deployment and training programmes, recognising the challenges posed by longer emergency response times and limited healthcare infrastructure access.

Technology integration policies should establish centralised, real-time AED location databases accessible through mobile phone applications, connected to emergency dispatch systems to enable rapid AED location identification during cardiac emergencies. Reflecting the demographic technology preferences identified in the third research objective, however, implementation of these systems must accommodate variance in digital literacy levels. As the study findings identified higher support among younger respondents (87.3%) compared to the support of those aged 65+ (56.8%). This further highlights the necessity for multi-modal approaches for information delivery.

Quality Assurance and Evaluation Frameworks

Policymakers need to create strong evaluation mechanisms to monitor the AED utilisation rates, response times, and survival outcomes. While also conducting longitudinal studies to assess the knowledge retention and programme effectiveness.

All AED training programmes should contain an accreditation standard to ensure consistent quality is provided across all training providers. The training courses should encompass regular competency assessments and refresher training requirements to ensure AED competency and first response skills retention.

In addition, the policy frameworks should mandate data collection systems to track the AED usage patterns in order to identify effective deployment strategies and training approaches. This evidence-based approach will facilitate the continuous AED programme refinement and evaluation for increased AED interventions. This approach allows for resource allocation optimisation based on the demonstrated AED intervention outcomes rather than theoretical assumptions.

5.2.4. Healthcare System and Public Health Implications

Drawing from the comprehensive demographic analysis conducted for the third research objective, the pronounced demographic disparities revealed critical vulnerabilities in emergency response capacity. Female respondents demonstrated significantly higher fear of causing harm (85.7% vs 35.8% for males) while simultaneously facing reduced likelihood of receiving AED intervention in public settings, creating a dual-vulnerability scenario. Reflecting the barrier analysis from the fourth research objective, the substantial barriers among older adults (55+ years) - who showed 43.2% fear of causing harm and 52.5% knowledge concerns - represent a concerning pattern given this cohort's higher cardiac risk profile. These findings necessitate demographic-specific intervention strategies and highlight the need for healthcare systems to address gendered and age-related barriers to emergency response.

5.2.5. Social and Community Response Implications

Directly supporting findings from the fourth research objective on barriers, a strong bystander effect emerged from the study findings, with intervention likelihood dropping 74% from individual to large group settings. This poses a significant challenge for cardiac

emergency response. To counteract this diffusion of responsibility, community education initiatives should directly address its psychological drivers. Furthermore, 78.2% of the survey respondents were unaware of existing Good Samaritan Law protections within Ireland. Suggesting a requirement for legal awareness campaigns and possibly inclusion of this as a component of the training programmes, to reduce intervention reluctance based on liability fears.

5.2.6. Technology Integration and Accessibility Implications

Informed by the demographic technology preferences identified in addressing the third research objective, while younger cohorts showed 87.3% support for app-based location services compared to only 56.8% among those aged 65+, the sophisticated understanding of technology limitations expressed by respondents suggests multi-modal approaches are necessary. The substantial respondent support for technological integration (78.5%, n=302) for mapping technologies, combined with notable generational variances in digital comfort levels, creates both opportunities and obstacles for AED accessibility initiatives. While younger respondents demonstrated significantly higher support for app-based location services (87.3%, n=168) compared to older adults aged 65+ (56.8%, n=39). The sophisticated understanding of technology limitations expressed by respondents suggests that multi-modal approaches are necessary. Emergency response systems must accommodate the variance in digital literacy levels when using technology to enhance AED accessibility and response times.

5.2.7. Educational and Awareness Programme Implications

Building comprehensively on the barrier identification from the fourth research objective, the psychological barriers to utilising AEDs are complex and multifaceted, with almost a third of survey respondents (32%, n=123) reporting multiple fears simultaneously. This indicates that traditional awareness campaigns are inadequate in overcoming these barriers. Effective education programmes must address, in parallel, fears of causing harm, knowledge gaps, legal concerns, and social-psychological barriers. Challenging assumptions related to the first research objective on awareness and knowledge, notably, higher educational attainment did not eliminate these barriers, which contradicts the assumptions about the correlation between education and emergency preparedness.

These findings highlight the need for specialised emergency response training for all, regardless of educational attainment.

5.3. Critical Evaluation of the Study

This research yielded valuable insights into public perceptions and barriers regarding AED utilisation through methodological approaches that were carefully selected and rigorously implemented. While certain constraints were inherent to the study design, the chosen methodology aligned with established European traditions of pragmatic, applied research that prioritises real-world applicability over theoretical purity. The following critical evaluation acknowledges limitations while defending the methodological choices as appropriate for addressing the research objectives within the available resources and timeframe.

Data collection and Inclusion criteria considerations

The study's methodological choices were deliberately designed to ensure data quality and respondent safety, though these decisions necessarily created some constraints. The study inclusion criteria, containing focused on the adult population of Ireland, were strategically chosen as adults represent the primary demographic capable of legal AED intervention. The requirement of a minimum age of 18 years resulted in the exclusion of younger individuals, though this was mitigated by targeting the optimal learning cohort (35-44 years) identified through the demographic analysis. The inclusion criteria also require those who were fluent in English to ensure adequate comprehension of the survey and provide accurate data. This methodological choice, while limiting, was essential for ensuring response validity and was anticipated during the design phase, with efforts made to use clear, accessible language throughout the instrument.

Survey Design Strengths and Considerations

The mixed-methods design enabled both theory testing through quantitative measures and theory development through qualitative insights, a particularly valuable approach for examining complex health behaviours. While the survey is structured with a multi-faceted approach to the question styles, such as the use of Likert scale questions, which can provide the opportunity to capture the respondents' intensity of their opinions (e.g., level

of confidence). The potential for leading questions was anticipated and mitigated through multiple rounds of pre-testing and refinement. An example of this is question 21, which assesses the bystander theory by asking if the potential responder assesses the likelihood of their intervention if they were the only person around the cardiac victim to gauge confidence and willingness scores. While this question structure was necessary to examine bystander effects systematically, this methodological trade-off was deemed appropriate given the research objectives and the need to generate actionable policy insights.

Sample Composition and Strategic Recruitment

The study's recruitment strategy, while resulting in certain demographic concentrations, yielded a sample size that achieved statistical significance with a 95% confidence interval and 5% margin of error. The survey was voluntary to adhere to ethical research conduct; however, this may also incorporate a self-selection bias to the study by attracting respondents who possess AED knowledge or have a particular interest or background relating to AEDs to complete the survey. This potential bias was anticipated and considered preferable to coercive recruitment methods that could compromise ethical standards.

The geographical concentration with 75.6% in Dublin, while limiting rural representation, reflects Ireland's demographic distribution, where the Greater Dublin Area contains approximately 40% of the national population. This Dublin-centric sample could potentially limit the generalisability of the findings to rural or other urban contexts across Ireland, though this concentration provided valuable insights into urban emergency response patterns and enabled detailed analysis of the most populous region.

The high levels of educational attainment, with 76.1% of respondents possessing third-level qualifications, while not perfectly representative, enabled sophisticated analysis of knowledge-action gaps that might not be detectable in populations with lower baseline health literacy. This educational bias, rather than being solely a limitation, provided conservative estimates of barriers - if highly educated respondents demonstrate significant knowledge-action gaps, the challenges in the broader population are likely more substantial.

The higher proportion of female respondents (gender split not specified in original) aligns with established patterns in health research participation and provided sufficient statistical power to detect the significant gender differences in fear-based responses that emerged as a key finding.

Measurement and Methodological Validation

The moderate reliability of the knowledge scale (Cronbach's α = 0.51), while below ideal thresholds, is not uncommon for instruments measuring practical knowledge in emergency contexts, where item heterogeneity reflects the diverse nature of AED-related knowledge domains. While Section 6 of the survey captures the self-declared barriers to AED use, which is a vital aspect of the study, this self-report methodology was chosen as the most feasible approach for capturing psychological barriers and was strengthened through the inclusion of multiple validation questions and demographic cross-referencing.

The cross-sectional design, while limiting causal inferences, was appropriate for this foundational study examining previously unexplored public perceptions in the Irish context. The completion of previous training is a key factor which can impact many of the variables assessed in the survey. However, the questions posed to the survey respondents do not assess specific training details. This methodological choice prioritised broad population screening over detailed training analysis, enabling identification of key patterns that can inform future longitudinal research.

Methodological Alignment with Research Traditions

This approach aligns with European traditions of pragmatic, applied research that emphasises real-world utility over methodological perfection. The mixed-methods design enabled a comprehensive examination of public health challenges while maintaining feasibility within academic constraints. The limitations identified were largely anticipated during the design phase and represent conscious methodological trade-offs rather than oversights.

5.3.1 Methodological limitations

Several methodological limitations must be acknowledged when interpreting these findings. However, these limitations should be viewed within the context of the study's

pioneering examination of AED perceptions in Ireland and the methodological constraints inherent in community health research. The study employed a volunteer sampling approach through online distribution, which may have introduced selection bias toward individuals with higher digital literacy and engagement with health-related topics. This approach was chosen to maximise reach while maintaining ethical standards, and the resulting sample provided sufficient diversity to identify significant demographic patterns.

The geographical distribution presents a significant limitation, with 75.58% (n=291) of respondents from Dublin. While this concentration limits rural generalisability, it enabled detailed analysis of Ireland's most populous region and provided insights that are applicable to urban emergency response systems nationwide. Rural-urban disparities in healthcare access and emergency response capabilities are well-documented in Ireland, making this geographical bias particularly concerning for policy applications.

5.3.2 Methodological Reflexivity: Researcher Positionality and Influence

In undertaking this study on public perceptions of Automated External Defibrillators (AEDs) and the barriers that affect their use, it is important to reflect on the ways in which my own professional background, assumptions, and positionality may have shaped the research process. Critical reflection on the researcher's position and background reveals several factors that may have significantly influenced both data collection and interpretation processes.

My current role within a health research institution, combined with previous employment in medical and healthcare settings, has inevitably influenced both my interest in and approach to this topic. As my current role also involves working with highly educated colleagues in both current and previous employments may have served as a likely contributor to the high levels of educational attainment in the survey responses. Similarly, my social and professional networks, in addition to circulating the survey within the company and employment social networks such as LinkedIn, may have acted as additional influences, causing 76.1% of respondents to possess above third-level qualifications.

This professional background raised a predisposition that influenced the recruitment of potential survey respondents predominantly from healthcare-adjacent fields and professional health research networks. My familiarity with medical terminology and healthcare systems may have unconsciously impacted the survey design, likely resulting in questions that were more accessible to individuals with healthcare literacy while inadvertently generating barriers for those with limited experience in health systems.

To mitigate this bias and ensure methodological rigour, I undertook careful consideration and refinement of the survey through multiple iterations with input from diverse stakeholders. This process aimed to ensure clarity in the survey design by explaining any abbreviations and avoiding medical jargon, ultimately creating a user-friendly instrument suitable for members of the public without medical or healthcare experience.

My previous experience in academic research allowed me to frame questions clearly, anticipate key themes, and accurately interpret respondents' accounts concerning technical details. However, this familiarity carries the risk of assuming a level of knowledge or rationality among the public respondents that may not reflect their lived experiences. I remained vigilant throughout the analysis process to avoid imposing a medical or researcher perspective on the narratives of community members, employing reflexive journaling and peer review to maintain analytical objectivity.

Moreover, my scientific training has cultivated an orientation towards evidence, heightening my awareness of accuracy, safety, and physiological considerations. Nonetheless, in exploring perceptions and barriers, which are heavily influenced by factors such as fear, confidence, trust, and social context rather than purely technical knowledge, I needed to take a more interpretive approach. This reflexive adjustment allowed me to resist prioritising medical and research knowledge over the authentic responses provided by survey respondents, contributing to the study's ability to identify novel psychological and social barriers not previously documented in the literature.

Furthermore, my location in Dublin significantly contributed to the geographical concentration observed in the survey responses (75.6% Dublin-based). Both my personal and professional networks are inherently geographically clustered. While every effort was made to distribute the survey to contacts outside of Dublin through multiple channels,

including professional associations, social media platforms, and snowball sampling techniques, the network effects were stronger than anticipated. However, despite the online distribution strategies, recirculation amongst social networks, the social media algorithms and network effects resulted in disproportionate urban representation. This reflects a common challenge in social research where researchers' location and background can directly impact the study's respondent sample composition obtained, regardless of intended national reach and attempts at broader outreach and inclusion.

The high levels of AED awareness (99.48%) and knowledge (83.07% correct AED identification) observed in the study, rather than being purely a function of sample bias, may reflect the effectiveness of recent public awareness campaigns in urban areas. This finding, when viewed through a reflexive lens, suggests that the knowledge-action gap identified may be even more significant than initially apparent - if highly educated, health-aware individuals demonstrate such substantial barriers, the challenges in the broader population warrant urgent attention.

My personal connection to the research topic, stemming from the loss of a close family friend to cardiac arrest, required careful management throughout the research process. While this experience provided valuable insights into the emotional aspects of cardiac emergencies, it was managed through supervisory consultation and reflexive practices to ensure that personal investment enhanced rather than compromised research quality. This personal connection, while enhancing motivation and ethical sensitivity, was channelled into methodological rigour rather than interpretive bias, contributing to the study's sensitive handling of psychological barriers and its comprehensive approach to demographic analysis.

The integration of multiple theoretical frameworks (Health Belief Model, Theory of Planned Behaviour, Social Cognitive Theory) reflects my academic training and provides a robust analytical foundation. Rather than creating confirmation bias, this multi-theoretical approach enabled the identification of novel findings that challenged existing assumptions, particularly regarding the complex role of social norms in emergency response behaviours.

These reflexive considerations highlight the importance of acknowledging researcher positionality while demonstrating how potential biases were actively managed and, in some cases, transformed into methodological strengths. My dual identity as both a health research professional and an academic researcher informed the study with valuable insights while necessitating continuous reflexivity to ensure that respondent voices remained central to the analysis. Future research building on these findings should implement deliberate strategies to address identified biases, including targeted rural recruitment, collaboration with community organisations, and partnership with researchers from diverse geographical and professional backgrounds.

5.3.2 Impact of limitations on findings

Generalisability and External Validity Considerations

While the geographical concentration in Dublin may affect rural generalisability, this sample provided valuable insights into emergency response patterns in Ireland's most populous region, where the majority of cardiac emergencies occur. Rural populations may face significantly different challenges, including longer emergency response times, fewer training opportunities, and different community knowledge networks. The educational bias, rather than simply limiting applicability, provides conservative estimates of barriers - if highly educated populations demonstrate significant knowledge-action gaps, the challenges in the broader population are likely more substantial, making the study's findings particularly relevant for public health planning.

Measurement Accuracy and Reliability Considerations

The reliance on self-reported confidence measures, while presenting interpretation challenges, was the most feasible approach for this population-level study and was strengthened through multiple validation questions and demographic cross-referencing. Research consistently demonstrates poor correlation between perceived and actual performance under stress; however, self-efficacy measures remain valuable predictors of behavioural intention and have proven utility in health behaviour research. The theoretical willingness to use AEDs reported by respondents may significantly overestimate actual intervention likelihood during real emergencies, though this

methodological limitation was anticipated and the findings interpreted accordingly, with emphasis on relative patterns rather than absolute prediction.

The voluntary approach may have attracted respondents with existing health interest or awareness, potentially inflating baseline knowledge levels. This conservative bias means that the identified knowledge gaps represent minimum estimates, with actual population-level deficits potentially more severe than reported, thereby strengthening rather than weakening the case for intervention.

Policy and Intervention Development Considerations

Further research examining the cost-effectiveness of different training modalities and public awareness campaigns would support evidence-based resource allocation for AED programme expansion. This could include economic evaluation of community training programmes versus media awareness campaigns.

While the findings are culturally specific to Ireland, they provide valuable insights that can inform comparative research and policy development in similar healthcare systems, particularly in European contexts with comparable emergency response infrastructure and cultural attitudes toward bystander intervention.

Research and Practice Implications

While the study achieved statistical significance with a 95% confidence interval and 5% margin of error, the demographic concentrations identified provide opportunities for targeted research and intervention development. These concentrations may have potentially led to an underestimation of some demographic barriers, including rural populations or individuals with lower educational attainment. However, this conservative bias strengthens the validity of identified barriers and suggests that intervention strategies may need to be more comprehensive and intensive than initially apparent.

The study's cross-sectional design, while limiting causal inferences, provides a robust foundation for longitudinal research and policy development. The temporal limitations cannot determine how public health campaigns may influence AED perceptions, though this represents an opportunity for future research rather than a fundamental flaw in the current methodology.

5.4. Recommendations

Based on the comprehensive analysis addressing all four research objectives, several critical evidence-based recommendations emerge for enhancing emergency response capabilities in Ireland. These recommendations are strategically organised by implementation timeframe and prioritised according to the strength of supporting evidence and potential impact on survival outcomes. Each recommendation specifies lead stakeholders and acknowledges resource implications to facilitate practical implementation planning.

Immediate Priorities (0-12 months): High-Impact, Low-Cost Interventions

Public Awareness Campaign for Good Samaritan Protections (Lead: Department of Health)

Priority Level: Critical - Resource Requirements: Low-Medium. The finding that 78.2% of respondents were unaware of existing legal protections represents the most actionable barrier identified in the study. Drawing from successful international models, particularly Norway's comprehensive bystander protection awareness campaign, which contributed to their 25% out-of-hospital cardiac arrest survival rate, Ireland should implement a multi-channel public information strategy. This campaign should utilise healthcare provider networks, social media platforms, and community organisations to disseminate clear, accessible information about legal safeguards for AED users.

Standardised AED Signage and Recognition Programme (Lead: National Standards Authority of Ireland)

Priority Level: High - Resource Requirements: Low, with 47.01% of respondents expressing uncertainty about AED symbol recognition, implementing standardised, culturally appropriate signage represents a cost-effective intervention with immediate impact potential. European best practices, particularly from Denmark's national AED marking system, demonstrate that consistent visual identification systems significantly improve device location and utilisation rates.

Gender-Sensitive Training Protocol Development (Lead: Irish Heart Foundation)

Priority Level: High - Resource Requirements: Medium The unprecedented finding that females demonstrate 85.7% fear of causing harm compared to 35.8% for males demands immediate attention through specialised training protocols. These programmes should incorporate peer support mechanisms, graduated exposure techniques, and confidence-building exercises specifically designed for female respondents.

Medium-Term Strategic Interventions (1-3 years): Systematic Infrastructure Development

Comprehensive National AED Training Mandate (Lead: Health and Safety Authority)

Priority Level: Critical - Resource Requirements: High. Building on successful programmes in Norway where mandatory workplace AED training contributed to their world-leading survival rates, Ireland should implement sector-specific training requirements. Priority sectors include education, hospitality, fitness, and retail industries, where large public gatherings occur. The 19.3% variance in confidence levels attributed to training demonstrates the substantial impact of systematic skill development.

Technology-Integrated Location Database (Lead: National Ambulance Service)

Priority Level: High - Resource Requirements: High, with 78.5% support for technological integration but significant generational differences (87.3% among 18-34 years vs 56.8% among 65+ years), a multi-modal approach is essential. Following successful models from Sweden's national AED app system integrated with emergency dispatch, Ireland should develop age-appropriate digital and analogue information systems that accommodate varying digital literacy levels.

Rural-Urban Equity Initiative (Lead: Rural and Community Development Programme)

Priority Level: High - Resource Requirements: High. The pronounced urban-rural disparities require targeted resource allocation strategies. This should include mobile training units, community champion programmes, and enhanced AED deployment in rural areas where emergency response times are extended. International evidence from Australia's rural emergency response programmes demonstrates the effectiveness of community-based training initiatives in geographically dispersed populations.

Long-Term Systemic Changes (3-5 years): Policy and Legislative Framework

National Cardiac Emergency Response Strategy (Lead: Department of Health)

Priority Level: Critical - Resource Requirements: Very High. A comprehensive national framework encompassing deployment standards, maintenance protocols, quality assurance mechanisms, and outcome monitoring systems. This strategy should mandate regular evaluation of AED utilisation rates, response times, and survival outcomes to enable continuous programme refinement.

Educational Curriculum Integration (Lead: Department of Education)

Priority Level: Medium - Resource Requirements: Medium. Building on the identified optimal learning capacity of the 35-44 age cohort, systematic integration of age-appropriate AED education throughout secondary and tertiary education systems. Evidence from Scandinavian countries where school-based CPR and AED training is mandatory demonstrates significant improvements in community emergency response capabilities.

Bystander Effect Mitigation Programmes (Lead: Civil Defence/Community Organisations)

Priority Level: High - Resource Requirements: Medium. The 74% reduction in intervention likelihood from individual to group settings demands innovative community education approaches. These programmes should incorporate role assignment protocols, leadership designation strategies, and community resilience training that directly address diffusion of responsibility in emergencies.

Quality Assurance and Evaluation Framework

Longitudinal Impact Assessment (Lead: Health Research Board)

Priority Level: High - Resource Requirements: Medium Systematic tracking of knowledge retention, confidence development, and behavioural change following intervention

implementation. This should include control group comparisons and longitudinal follow-up to assess programme effectiveness and inform continuous improvement.

International Best Practice Integration (Lead: Irish Heart Foundation)

Priority Level: Medium - Resource Requirements: Low. Formal partnerships with high-performing countries, particularly Norway, Denmark, and Sweden, to facilitate knowledge transfer and adaptation of proven strategies to the Irish context. This includes staff exchanges, joint research initiatives, and systematic policy benchmarking.

Implementation Feasibility and Resource Considerations

The total estimated investment for comprehensive implementation ranges from €15-25 million over five years, with potential cost savings through reduced healthcare utilisation and improved survival outcomes. Evidence from international programmes suggests return on investment ratios of 3:1 to 5:1 through reduced long-term care costs and productivity gains from improved cardiac arrest survival.

Priority should be given to immediate interventions that address the most significant barriers identified while building foundation infrastructure for long-term success. The phased approach enables resource allocation optimisation and allows for programme refinement based on early implementation outcomes.

5.4.1. Suggestions for future research

Based on the study's findings and their implications for saving lives, the following research priorities are ranked according to their potential impact on cardiac arrest survival outcomes and the strength of evidence gaps identified in the current investigation.

Priority 1: Longitudinal Training Effectiveness and Knowledge Retention Studies

Rationale: Critical for optimising life-saving interventions Building directly on the substantial knowledge-action gap identified where only 37.41% expressed usage confidence despite 99.48% awareness, future research should employ longitudinal studies examining AED training effectiveness. This should assess the durability and declining patterns of AED training effectiveness over time in order to determine the

optimal frequency for refresher training sessions. The studies should also explore strategies to sustain both technical competence and psychological readiness among diverse populations. Given that trained individuals demonstrated tripled intervention likelihood, understanding how to maintain these effects could significantly impact survival rates.

Priority 2: Gender-Specific Emergency Response Research

Rationale: Addresses dual vulnerability with immediate life-saving implications. The study's revelation of a pronounced gender disparity with substantially higher fear of causing harm in females (85.7%) compared to males (35.8%) represents a critical research priority given the life-and-death implications. This alarming difference warrants targeted investigation to identify the underlying cultural, psychological, and societal factors potentially contributing to these gendered responses, while creating and evaluating gender-sensitive training interventions. Most critically, research is urgently needed to examine the dual vulnerability of females who are both less likely to provide and receive AED interventions during cardiac emergencies - addressing this disparity could significantly improve survival outcomes for female cardiac arrest victims.

Priority 3: Bystander Effect Mitigation in Emergency Contexts

Rationale: Directly impacts intervention likelihood and survival outcomes. As respondents' willingness decreased by 74% from individual (37.1%) to large group settings (26.7%), research addressing this pronounced bystander effect represents a significant opportunity to improve emergency response rates. Future studies should focus on developing and evaluating community-based training programmes that specifically address social diffusion of responsibility in emergencies. This should be achieved through incorporating role assignment protocols, leadership designation strategies, and building public knowledge and confidence that could counteract group inhibition effects. Research should prioritise interventions that can be rapidly implemented in high-traffic public areas where cardiac arrests commonly occur.

Priority 4: Rural-Urban Emergency Response Disparities

Rationale: Addresses geographic inequities in life-saving resources. While this study accumulated predominantly Dublin-based respondents (75.6%), the findings suggest critical geographic disparities in AED access and utilisation between urban and rural Ireland. Research should focus on examining response times, accessibility of training, and community-specific barriers encountered in rural settings where emergency services response times are inherently longer. Additionally, research should assess innovative approaches, including AED drone delivery systems and mobile training initiatives, to effectively reach geographically dispersed populations. Given that survival rates decrease by 7-10% for each minute delay in defibrillation, addressing rural-urban disparities represents a significant opportunity to save lives in underserved areas.

Priority 5: Technology Integration and Digital Divide Solutions

Rationale: Enhances rapid AED location and accessibility. The survey respondents indicated a strong preference for digital integration of AED location services (78.5%), despite considerable generational differences (87.3% among 18-34 years vs 56.8% among 65+ years). Research should explore the most effective technological solutions that accommodate varying digital literacy levels, including assessment of smartphone-based AED location systems' performance during actual emergencies. Investigation should focus on multi-modal information delivery approaches that overcome barriers related to the digital divide while enabling rapid device location during time-critical cardiac emergencies.

Priority 6: Legal Protection Awareness and Policy Effectiveness Research

Rationale: Removes critical barriers to bystander intervention. Given that 78.2% of respondents lacked awareness of Good Samaritan legal protections, research is needed to rigorously assess the efficacy of public awareness campaigns regarding legal safeguards. Additionally, studies should explore policy interventions designed to enhance bystander confidence in emergencies. Comparative analyses across varying legal frameworks could inform evidence-based policy recommendations for optimising emergency response legislation. Research should particularly focus on measuring whether increased legal awareness translates to improved intervention rates during actual cardiac emergencies.

Priority 7: Qualitative Exploration of Psychological and Cultural Barriers

Rationale: Provides a deeper understanding for targeted intervention development. While the primarily quantitative approach identified significant statistical relationships, complementary qualitative research employing in-depth interviews and focus groups could provide more nuanced exploration of the psychological and cultural factors contributing to AED hesitancy. These approaches should provide insights into the complex interplay between knowledge, confidence, and action identified in the thematic analysis. Research should particularly focus on understanding cultural factors that influence emergency intervention behaviours in Irish contexts, enabling the development of culturally appropriate training and awareness programmes.

Priority 8: Targeted Intervention Development and Evaluation

Rationale: Develops evidence-based solutions for identified barriers. Building on identified barriers, research should focus on developing and evaluating confidence-building programmes tailored for high-barrier demographics, particularly females and older adults. Additionally, scenario-based training programmes should be designed and tested to mitigate the bystander effect. Furthermore, community-wide educational initiatives that integrate technical skills training with psychological preparedness should be developed and rigorously evaluated for effectiveness in improving both intention and actual intervention behaviours.

By prioritising research in these areas based on their potential to save lives, future investigations can build upon the foundational insights from this study to develop more effective, culturally sensitive, and technologically integrated approaches to improving public responses to cardiac emergencies, ultimately increasing survival outcomes for out-of-hospital cardiac arrest victims across Ireland.

5.5. Conclusion

This investigation into public AED awareness, confidence and barriers reveals significant gaps between recognition and actionable competency impacting Ireland's emergency response effectiveness. The comprehensive analysis of 385 survey responses, addressing all four research objectives, demonstrates that while high levels of device

awareness (99.48%) exist among the Irish public, substantial barriers prevent optimal utilisation in cardiac emergencies.

The study findings uncovered a complex interplay of demographic influences, with urban populations, particularly Dublin residents, demonstrating higher knowledge outcomes, potentially reflecting better healthcare access and resource distribution. The pronounced geographical disparity (75.6% Dublin concentration) creates concerning knowledge gaps in rural areas where emergency response times are longer and resources are more limited. Furthermore, this geographical disparity creates concerning knowledge gaps in rural areas where emergency response times are longer and limited resources are provided.

Most significantly, the research identified previously undocumented gender disparities in emergency response behaviour, with females demonstrating substantially higher fear of causing harm (85.7% vs 35.8% for males) while simultaneously being less likely to receive AED interventions - a dual vulnerability that demands immediate policy attention. The pronounced bystander effect, showing a 74% reduction in intervention likelihood from individual to group settings, represents a critical barrier to emergency response that has not been adequately addressed in existing training programmes.

Improving AED utilisation nationally requires coordinated, multi-faceted interventions addressing knowledge, confidence, accessibility, and systemic barriers simultaneously, rather than single-approach solutions. These interventions include addressing demographic disparities through targeted education programmes, knowledge gaps using systematic skills-based training and geographic equity by expanding rural initiatives.

The complex, multi-layered psychological barriers should be addressed by increasing legal protection awareness campaigns and implementing this in AED training programmes. The finding that 78.2% of respondents were unaware of Good Samaritan protections represents an immediately actionable policy target.

The findings provide a clear roadmap for evidence-based policy development and programme implementation, emphasising community-based strategies integrated with healthcare systems for sustainable knowledge maintenance. The research contributes essential insights for enhancing community resilience and emergency response

preparedness, with demonstrated potential to save lives through improved public response capabilities during cardiac emergencies. Implementation of the prioritised recommendations could significantly impact Ireland's out-of-hospital cardiac arrest survival rates, which currently lag behind international best practices observed in countries such as Norway and Denmark.

5.6. Final Reflections

This research journey has been transformative in multiple dimensions, enhancing my capabilities as a researcher while deepening my understanding of the complexities inherent in empirical inquiry. The experience has demonstrated that conducting rigorous quantitative research requires not only technical skills but also philosophical sophistication, ethical sensitivity, and reflexive awareness.

This research process has fundamentally transformed my understanding of what it means to be a reflective and methodologically aware researcher, particularly within the European tradition of pragmatic applied research that prioritises real-world impact over methodological perfection. The investigation into public perceptions of automated external defibrillators (AEDs) and barriers to their use has provided invaluable insights that extend far beyond the specific research findings.

Designing and implementing a mixed-methods quantitative survey for the first time provided profound insights into the complexity of primary data collection that balances theoretical rigour with practical feasibility. This experience dramatically shifted my perspective on survey research, transforming my previously superficial engagement with workplace surveys into an appreciation for the meticulous planning required for effective data collection. The process demanded careful consideration of question formulation, sequencing, and potential psychological impacts on respondents.

The sensitive nature of cardiac health topics required particular ethical sensitivity, especially given the potential for questions to evoke distressing memories of cardiac events or bereavement among respondents. Drawing from personal experience---having lost a close family friend to cardiac arrest --- I approached question design with heightened awareness of the emotional burden that research participation might impose. This personal connection to the research topic, rather than compromising objectivity,

enhanced my commitment to ethical research practices while providing authentic insights into the emotional dimensions of emergency response behaviours.

The systematic review of existing literature on AED perceptions and barriers developed my capacity for critical analysis and synthesis while revealing significant gaps in European research contexts. This process taught me to evaluate research quality, identify methodological strengths and limitations, and synthesise findings across diverse studies to build a comprehensive understanding of the research domain. Most importantly, it highlighted the need for culturally specific research that acknowledges the unique healthcare systems, legal frameworks, and social contexts that influence emergency response behaviours.

The literature review process deepened my appreciation for behavioural models and their explanatory power while revealing the limitations of applying predominantly American psychological theories to European populations. This theoretical grounding has had tangible effects on my daily observations and experiences. For instance, after studying public perceptions of AEDs, I became acutely aware of these devices in my environment- a heightened consciousness I now recognise as the Baader-Meinhof phenomenon. This exemplifies how research engagement can fundamentally alter one's perception and awareness of the studied phenomenon, demonstrating the reflexive relationship between the researcher and the research topic that characterises engaged scholarship.

Engaging with research philosophy opened new dimensions of understanding about the epistemological foundations of knowledge creation in applied health research. Through systematic examination of ontological, epistemological, methodological, and axiological frameworks, I developed a nuanced understanding of how different philosophical perspectives shape research approaches. This exploration revealed that pragmatic philosophical positioning - prioritising practical outcomes while maintaining methodological rigour - aligns with European traditions of applied research that seek to address real-world problems through evidence-based inquiry.

Learning to conduct inferential statistics represented a significant methodological milestone that extended my analytical capabilities beyond descriptive reporting to meaningful pattern identification. This process developed my analytical capabilities and

enhanced my ability to draw meaningful conclusions from quantitative data while maintaining appropriate caution about statistical significance versus practical significance. The challenge of moving beyond descriptive statistics to understand relationships and patterns within the data strengthened my critical thinking and analytical reasoning skills while highlighting the importance of interpreting statistical findings within broader social and cultural contexts.

Perhaps most importantly, this research experience taught me that methodological limitations are not failures but rather conscious choices that reflect resource constraints, ethical considerations, and practical feasibility within applied research contexts. The process of acknowledging, defending, and learning from these limitations has enhanced my capability to design future research that builds systematically on previous work while addressing identified gaps.

The experience of conducting research with direct policy implications has highlighted the responsibility that researchers bear in translating findings into actionable recommendations that can improve public health outcomes. This has reinforced my commitment to engaged scholarship that maintains academic rigour while addressing practical problems that affect community wellbeing.

In conclusion, this dissertation process has been both challenging and profoundly rewarding, providing not only subject-specific knowledge about AED perceptions but also fundamental research competencies that align with European traditions of applied, pragmatic research. The experience has instilled a deep appreciation for the complexity of social research while demonstrating the potential for empirical inquiry to contribute meaningfully to public health policy and practice. Most significantly, it has reinforced my commitment to research that serves both academic advancement and community benefit - a dual purpose that characterises the best traditions of applied health research.

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Appendices

Appendix 1 – Survey Questionnaire – Hard copy

Survey Questionnaire:

Introduction

Dear Participant,

Thank you for participating in this survey relating to defibrillators which are also known as Automated External Defibrillators (AEDs). The purpose of this survey is to understand public perceptions and utilisation of AEDs in Ireland. The main objective of this study is to investigate the association between the public demographics (e.g. age, education level, etc.) and their knowledge of AEDs. Other objectives include the identification of perceived barriers to AED use in comparison with the level of understanding of AEDs. The study will also evaluate the relationship between awareness levels amongst the public and their demographic responses. Please answer the questions honestly, and all responses will be kept confidential.

Research Title:

Public Perceptions and Utilisation of Automated External Defibrillators(AEDs) in Ireland: A quantitative and qualitative analysis of awareness, confidence and barriers to AED use in 2025.

Survey structure:

There are 34 questions in total. The last 2 questions are optional. The survey should take approximately 10 minutes to complete, depending on the depth of your response.

Participant's consent:

- Your participation is voluntary
- You have the right to refuse completing this survey at any time

Participant's data:

- Any obtained data will be used for research purposes only
- All responses will remain anonymous and confidential
- Data will be retained for a maximum duration of 1 year post final submission of the master's degree in August 2025
- Data will strictly adhere to GDPR legislation
- Data collected will be securely stored on a password protected laptop which can only be accessed by the researcher. The laptop will be stored in a secure location where only the researcher will have access.

Thank you in advance for your valuable insights.

Abbreviations:

AED Automated External Defibrillator

CPR Cardiopulmonary Resuscitation

GDPR General Data Protection Regulation

Consent:

1. **I have read and understand the information above**
   ☐ Yes
   ☐ No **This will default the survey to terminate at this question**

2. **By ticking the following boxes, I consent to participating in this study:**
   ***Mandatory to tick all boxes prior to completing this survey**
   ☐ I am fluent in English
   ☐ I understand the purpose of this survey
   ☐ I consent to my information being used only for the purposes of this survey & study
   ☐ I consent to participate in this survey

Section 1: Demographics

1. **Age**:
   - ☐ 18- 24 years
   - ☐ 25- 34years
   - ☐ 35-44 years
   - ☐ 45-54 years
   - ☐ 55-64 years
   - ☐ 65-74years
   - ☐ 75+ years

2. **Gender**:
   - ☐ Male
   - ☐ Female
   - ☐ Other

3. **Completed education level**:
   - ☐ Primary School
   - ☐ Secondary School
   - ☐ Trade/Technical school (post-leaving certificate course)
   - ☐ Third Level (University/College/Institute)
   - ☐ Postgraduate (includes Certificate, Diploma, Masters)
   - ☐ Doctorate Degree
   - ☐ Prefer not to say

4. **Employment Status**:
   - ☐ Employed in Healthcare/Medical /Science related field
   - ☐ Employed
   - ☐ Self-employed
   - ☐ Freelance/Contractor

- ☐ Unemployed
- ☐ Student
- ☐ Retired
- ☐ Other (please specify) _____

5. **Location:**

A dropdown list will appear to select the county appropriate.

- ☐ Antrim
- ☐ Armagh
- ☐ Carlow
- ☐ Cavan
- ☐ Clare
- ☐ Cork
- ☐ Derry
- ☐ Donegal
- ☐ Down
- ☐ Dublin
- ☐ Fermanagh
- ☐ Galway
- ☐ Kerry
- ☐ Kildare
- ☐ Kilkenny
- ☐ Laois
- ☐ Leitrim
- ☐ Limerick
- ☐ Longford
- ☐ Louth
- ☐ Mayo
- ☐ Meath
- ☐ Monaghan
- ☐ Offaly
- ☐ Roscommon
- ☐ Sligo
- ☐ Tipperary
- ☐ Tyrone
- ☐ Waterford
- ☐ Westmeath
- ☐ Wexford
- ☐ Wicklow

Section 2: Awareness of AEDs

6. **Have you ever seen or heard of a 'Defibrillator' also known as an Automated External Defibrillator (AED)?**

   ☐ Yes

   ☐ No

   ☐ Not sure

7. **If yes, where did you first see/hear about Defibrillators (AEDs)? (Select only one):** **(This question will be hidden if previous answer was no)**

   ☐ TV

   ☐ Radio

   ☐ Social media

   ☐ Media (news reports)

   ☐ Emergency services advert

   ☐ Word of mouth (family, friend or colleague)

   ☐ Education (School or University)

   ☐ Training programme (e.g. CPR/AED training)

   ☐ Witnessing an AED being used

   ☐ Employment

   ☐ Seeing an AED in an everyday location (shop, sports club, etc)

   ☐ I cannot recall

   ☐ Other (please specify) _____

8. **Do you know where any (at least one or more) Defibrillators (AED) are located in your community?**

- ☐ Yes
- ☐ No

9. **If yes, please specify where: (please tick all that apply) (This question will be hidden if previous answer was no)**

- ☐ Local shop
- ☐ Sports club
- ☐ Stadium
- ☐ Employment
- ☐ Airport
- ☐ Hospital
- ☐ School
- ☐ College
- ☐ Transport station
- ☐ Pharmacy
- ☐ Community centre
- ☐ Shopping centre
- ☐ Other (please specify) _____

10. **Have you ever had previous medical training? (e.g. First aid, Cardiopulmonary Resuscitation (CPR), Defibrillator training)**

- ☐ Yes
- ☐ No

11. **If yes, please select all that apply (This question will be hidden if previous answer was no)**

- ☐ First aid training

- ☐ CPR training
- ☐ AED training
- ☐ Other (please specify) _____

Section 3: Understanding of AEDs

12. **What is the purpose of using a defibrillator (AED)?**
    - ☐ To temporarily stop the heart
    - ☐ To provide CPR
    - ☐ To provide a shock to the heart
    - ☐ To improve blood flow
    - ☐ I don't know

13. **Defibrillators (AEDs) can be used on children (Children = approx. age 1-8 years old). True or False?**
    - ☐ True
    - ☐ False
    - ☐ I don't know

14. **Where should the defibrillator (AED) electrode pads be placed on the body of the person experiencing cardiac arrest?**
    - ☐ Both pads should be placed apart on the chest side by side
    - ☐ Both Pads should be placed in the centre of the chest next to each other
    - ☐ One pad on the upper right chest and one pad on the lower left side of the chest
    - ☐ One pad on the chest and one pad on the lower abdomen
    - ☐ I don't know

15. **Chest hair, clothing or raindrops will impact the effectiveness of the defibrillator (AED). True or False?**
    - ☐ True
    - ☐ False
    - ☐ I don't know

16. **The person receiving the defibrillator (AED) shock will jump a number of inches off the floor upon receipt. True or False?**
    - ☐ True
    - ☐ False
    - ☐ I don't know

Section 4: Experience/exposure of AEDs

17. **Have you ever used a defibrillator (AED) in a real-life emergency?**
    - ☐ Yes
    - ☐ No

18. **Have you ever seen a defibrillator (AED) being used on someone in a real-life emergency?**
    - ☐ Yes
    - ☐ No

Section 5: Knowledge of AEDs

19. **If you witnessed someone in cardiac arrest and you were the only person around, how likely would you be to use a defibrillator on them? (Cardiac Arrest Symptoms = Person collapses, is not breathing or gasping for breath, not responsive, no pulse)**
    - ☐ Extremely likely
    - ☐ Likely
    - ☐ Neutral
    - ☐ Unlikely
    - ☐ Extremely unlikely

20. **If you witnessed someone in cardiac arrest and you were around a small group of people (e.g., 3-5 people), how likely would you be to use a defibrillator on the person in cardiac arrest?**
    - ☐ Extremely likely

- [ ] Likely
- [ ] Neutral
- [ ] Unlikely
- [ ] Extremely unlikely

21. **If you witnessed someone in cardiac arrest and you were around a large group of people (e.g., 10+ people), how likely would you be to use a defibrillator on the person in cardiac arrest?**
    - [ ] Extremely likely
    - [ ] Likely
    - [ ] Neutral
    - [ ] Unlikely
    - [ ] Extremely unlikely

22. **Would you be interested in attending a free defibrillator (AED) training course? (In person community training for 3 hrs approx.)**
    - [ ] Yes
    - [ ] No

23. **If yes, which form of training would be your preference? (Select all that apply): (This question will be hidden if previous answer was no)**
    - [ ] Online
    - [ ] In-person
    - [ ] In the workplace
    - [ ] In your local community centre
    - [ ] Any of the above

Section 6: Barriers to AED Use

24. **What are the reasons you might not want to use a defibrillator (AED) in an emergency? (Select all that apply)**
    - [ ] Fear of causing harm

- [ ] Lack of knowledge/training
- [ ] Fear of legal repercussions
- [ ] Illness contraction (eg. viruses such as covid-19)
- [ ] Anxiety in an emergency situation
- [ ] Fear of using it when not required
- [ ] Fear of sight of blood (if present resulting from an injury)
- [ ] No specific reasons
- [ ] Other (please specify) _____

25. **Do you think defibrillators (AEDs) are easily accessible in public places in your local area?**

- [ ] Yes
- [ ] No
- [ ] I don't know

26. **Have you ever experienced or witnessed someone having difficulty in locating a defibrillator (AED)?**

- [ ] Yes
- [ ] No

27. **Are you aware of any legal protections that apply when using a defibrillator (AED)? E.g. Good Samaritan Act**

- [ ] Yes
- [ ] No

Section 7: Confidence in AED use

28. **Would you feel confident in recognising a defibrillator (AED) in a public place?**

- [ ] Very confident

- ☐ Confident
- ☐ Neutral
- ☐ Not very confident
- ☐ Not confident at all

29. **Would you feel confident in recognising the international symbol for a defibrillator (AED)?**
    - ☐ Yes
    - ☐ No

30. **How confident would you feel in knowing when to use a defibrillator (AED) on someone?**
    - ☐ Very confident
    - ☐ Confident
    - ☐ Neutral
    - ☐ Not very confident
    - ☐ Not confident at all

Section 8: Open-Ended Questions

31. **In your opinion, where should defibrillators (AEDs) be placed?** *Optional*

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32. **Would you expect to see defibrillator (AED) locations appearing in google maps?** *Optional*

Closing/Conclusion

Thank you for taking the time to complete this survey. Your input is extremely valuable to this research. This will hopefully inform on future practices around Automated External Defibrillators.

Appendix 2 –Survey Questionnaire – Survey Monkey

* 1. I have read and understand the information below.

Consent Research Title: Public Perceptions and Utilisation of Automated External Defibrillators(AEDs) in Ireland: A quantitative and qualitative analysis of awareness, confidence and barriers to AED use in 2025.

Aim: to investigate the association between the public demographics (e.g. age, education level, etc.) and their knowledge of AEDs.

Participant's consent:
· Your participation is voluntary
· You have the right to refuse completing this survey at any time

Participant's data:
· Any obtained data will be used for research purposes only
· All responses will remain anonymous and confidential
· Data will be retained for a maximum duration of 1 year post final submission of the master's degree in August 2025
· Data will strictly adhere to GDPR legislation

Researcher's contact details:
rachel.mcdermott@student.griffith.ie

◯ Yes

◯ No

* 2. I consent to participating in this study and meet the criteria points listed below;
· I am fluent in English
· I understand the purpose of this survey
· I consent to my information being used only for the purposes of this survey & study
· I consent to participate in this survey

◯ Yes

◯ No

* 3. Age

◯ 18-24

◯ 25-34

◯ 35-44

◯ 45-54

◯ 55-64

◯ 65-74

◯ 75+

* 4. Gender

- ◯ Male
- ◯ Female
- ◯ Other

* 5. Completed education level

- ◯ Primary School
- ◯ Secondary School
- ◯ Trade/Technical school (post-leaving certificate course)
- ◯ Third Level (University/College/Institute)
- ◯ Postgraduate (includes Certificate, Diploma, Masters)
- ◯ Doctorate Degree
- ◯ Prefer not to say

* 6. Employment Status

- ◯ Employed in Healthcare/Medical /Science related field
- ◯ Employed
- ◯ Self-employed
- ◯ Freelance/Contractor
- ◯ Unemployed
- ◯ Student
- ◯ Retired
- ◯ Other (please specify)

* 7. Location

* 8. Have you ever seen or heard of a 'Defibrillator' also known as an Automated External Defibrillator (AED)?

- ◯ Yes
- ◯ No
- ◯ Not sure

9. If yes, where did you first see/hear about Defibrillators (AEDs)? (select one option)

- ◯ TV
- ◯ Radio
- ◯ Social media
- ◯ Media (news reports)
- ◯ Emergency services advert
- ◯ Word of mouth (family, friend or colleague)
- ◯ Education (School or University)
- ◯ Training programme (eg. CPR/AED training)
- ◯ Witnessing an AED being used (in real life)
- ◯ Employment
- ◯ Seeing an AED in an everyday location (shop, sports club, etc)
- ◯ I cannot recall
- ◯ Other (please specify)

* 10. Do you know where any (at least one or more) Defibrillators (AED) are located in your community?

- ◯ Yes
- ◯ No

11. If yes, please specify where (please tick all that apply)

- [ ] Local shop
- [ ] Sports club
- [ ] Stadium
- [ ] Employment
- [ ] Airport
- [ ] Hospital
- [ ] School
- [ ] College
- [ ] Transport station
- [ ] Pharmacy
- [ ] Community centre
- [ ] Shopping centre
- [ ] Other (please specify)

* 12. Have you ever had previous medical training? (eg. First aid, Cardiopulmonary Resuscitation (CPR), Defibrillator training)

- ◯ Yes
- ◯ No

13. If Yes, please select all that apply

- [ ] First aid training
- [ ] CPR training
- [ ] AED training
- [ ] Other (please specify)

14. What is the purpose of using a defibrillator (AED)?

- ◯ To temporarily stop the heart
- ◯ To provide CPR
- ◯ To provide a shock to the heart
- ◯ To improve blood flow
- ◯ I don't know

15. Defibrillators (AEDs) can be used on children (Children = approx. age 1-8 years old). True or False?

- ◯ True
- ◯ False
- ◯ I don't know

16. Where should the defibrillator (AED) electrode pads be placed on the body of the person experiencing cardiac arrest?

- ◯ Both pads should be placed apart on the chest side by side
- ◯ Both Pads should be placed in the centre of the chest next to each other
- ◯ One pad on the upper right chest and one pad on the lower left side of the chest
- ◯ One pad on the chest and one pad on the lower abdomen
- ◯ I don't know

17. Chest hair, clothing or raindrops will impact the effectiveness of the defibrillator (AED). True or False?

- ◯ True
- ◯ False
- ◯ I don't know

18. The person receiving the defibrillator (AED) shock will jump a number of inches off the floor upon receipt. True or False?

- ◯ True
- ◯ False
- ◯ I don't know

19. Have you ever used a defibrillator (AED) in a real-life emergency?

- ◯ Yes
- ◯ No

20. Have you ever seen a defibrillator (AED) being used on someone in a real-life emergency?

- ◯ Yes
- ◯ No

* 21. If you witnessed someone in cardiac arrest and you were the only person around, how likely would you be to use a defibrillator on them? (Cardiac Arrest Symptoms = Person collapses, is not breathing or gasping for breath, not responsive, no pulse)

- ◯ Very likely
- ◯ Likely
- ◯ Neither likely nor unlikely
- ◯ Unlikely
- ◯ Very unlikely

* 22. If you witnessed someone in cardiac arrest and you were around a small group of people (e.g., 3-5 people), how likely would you be to use a defibrillator on the person in cardiac arrest?

- ◯ Very likely
- ◯ Likely
- ◯ Neither likely nor unlikely
- ◯ Unlikely
- ◯ Very unlikely

* 23. If you witnessed someone in cardiac arrest and you were around a large group of people (e.g., 10+ people), how likely would you be to use a defibrillator on the person in cardiac arrest?

- ◯ Very likely
- ◯ Likely
- ◯ Neither likely nor unlikely
- ◯ Unlikely
- ◯ Very unlikely

* 24. Would you be interested in attending a free defibrillator (AED) training course? (In person community training for 3 hrs approx.)

- ◯ Yes
- ◯ No

25. If yes, which form of training would be your preference? (Select all that apply):

- [ ] Online
- [ ] In-person
- [ ] In the workplace
- [ ] In your local community centre
- [ ] Any of the above

26. What are the reasons you might not want to use a defibrillator (AED) in an emergency? (Select all that apply)

- [ ] Fear of causing harm
- [ ] Lack of knowledge/training
- [ ] Fear of legal repercussions
- [ ] Illness contraction (eg. viruses such as covid-19)
- [ ] Anxiety in an emergency situation
- [ ] Fear of using it when not required
- [ ] Fear of sight of blood (if present resulting from an injury)
- [ ] No specific reasons
- [ ] Other (please specify)

* 27. Do you think defibrillators (AEDs) are easily accessible in public places in your local area?

- ◯ Yes
- ◯ No
- ◯ I don't know

* 28. Have you ever experienced or witnessed someone having difficulty in locating a defibrillator (AED)?

- ◯ Yes
- ◯ No

* 29. Are you aware of any legal protections that apply when using a defibrillator (AED)? E.g. Good Samaritan Act

- ◯ Yes
- ◯ No

* 30. Would you feel confident in recognising a defibrillator (AED) in a public place?

- ◯ Very confident
- ◯ Confident
- ◯ Neutral
- ◯ Not very confident
- ◯ Not confident at all

* 31. Would you feel confident in recognising the international symbol for a defibrillator (AED)?

- ◯ Yes
- ◯ No

* 32. How confident would you feel in knowing when to use a defibrillator (AED) on someone?

- ◯ Very confident
- ◯ Confident
- ◯ Neutral
- ◯ Not very confident
- ◯ Not at all confident

33. In your opinion, where should defibrillators (AEDs) be placed?

34. Would you expect to see defibrillator (AED) locations appearing in google maps & explain your answer?

Appendix 3 –Ethics Application & Declaration Form

Ethics Application & Declaration Form

DISSERTATION TITLE: Utilisation of Automated External Defibrillators (AEDs) in Ireland: A quantitative and qualitative analysis of awareness, confidence and barriers to AED use in 2025.

RESEARCHER'S NAME: Rachel McDermott

PROGRAMME OF STUDY: Master of Science in Medical Device Technology and Business

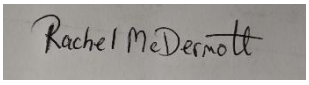
SUPERVISOR'S NAME: Justin Keogan

DECLARATION:

The information in this application form is accurate to the best of my knowledge. I undertake to abide by the principles outlined by Innopharma/Griffith College ethics policy in my research dissertation. I confirm that I have completed a full ethics assessment for my research dissertation as per the college guidelines. I will not begin my primary research until such approval from my supervisor and/or ethics Committee has been obtained.

I pledge to carry out my research according to the Innopharma/Griffith College academic integrity standards. Any results presented in my dissertation will be from my own, original research, I will reference and/or acknowledge any material or sources used in its preparation and I will not plagiarise the work of anyone else.

For Student:

STUDENT SIGNATURE: 

DATE: 14th May 2025

The research contained within this research dissertation proposal has been approved.

For Supervisor:

Ethics Committee Approval Required: Yes ☐ No ☒

SUPERVISOR SIGNATURE: Justin F. Keogan

DATE: 14th May 2025

For Ethics Committee (if required):

Ethics Committee Approval Given: Yes ☐ No ☐

ETHICS COMMITTEE MEMBER SIGNATURE:

DATE:

NOTE: Supervisors are responsible for ensuring their students fill in this form correctly and that all ethical areas have been considered.

SECTION 1: DESCRIPTION

1.1 **Purpose and objectives of research**

This research aims to comprehensively investigate the existing landscape regarding public perceptions and utilisation of Automated External Defibrillators (AEDs) across Ireland in 2025. Specifically focusing on the levels of awareness, confidence, and barriers to AED use.

Despite the established life-saving potential of AEDs in improving survival rates from out-of-hospital sudden cardiac arrest (SCA), there is evidence to suggest underutilisation amongst Irish communities. The SCA is a condition responsible for thousands of deaths annually in Ireland, with an Out-of-Hospital Cardiac Arrest (OHCA) survival rate currently around 8.4% in 2023 in Ireland (National Ambulance Service, 2023a). This publication in 2023 is the most recent data in Ireland. Therefore, there is a notable absence in analysis of Out-of-Hospital Cardiac Arrest (OHCA) from the years 2023 to 2025 in Ireland. This study will fulfil this knowledge gap and provide a recent reflection of the public perceptions across Ireland in 2025.

Nationally, Ryan et al. (2021) identified only 30 out of 142 study participants expressed willingness to use an AED prior to any formal training, indicative of a persistent requirement for targeted educational interventions. Similarly, on an international level, comparable trends were identified as Pei-Chuan Huang et al. (2021) reported that just 5.3% of 1,073 respondents felt confident to use an AED.

Therefore, the primary purpose of this study is to identify specific knowledge gaps, psychological barriers, and structural impediments that may hinder optimal public engagement with AEDs during OHCAs. Additionally, this research aims to assess the current levels of public knowledge and attitudes toward AEDs, providing both quantitative and qualitative insights into how these factors influence AED utilisation. In conjunction with identifying the specific impediments and misconceptions as deterrents for AED use. By employing a combined methodology of both quantitative and qualitative data collection the research can gain a deeper insight into the nuanced factors influencing the public's behaviours. Thus, improving bystander intervention rates and OHCA survival outcomes.

Ultimately, this study aspires to contribute to potentially life-saving public health initiatives through the identification of actionable barrier and the enhancing community willingness to respond to OHCAs utilising AEDs. This could be achieved through informing improvements to policy development for public health strategies. These may include raising awareness of AED deployment and further facilitation of educational programmes to align with HSE's national efforts in enhancing the chain of survival.

1.2 **Research methodology:**

The methodology employed to conduct this research will include a structured survey questionnaire. This survey will aim to obtain awareness levels and gauge potential barriers to the public use of AEDs. The survey will be circulated online to facilitate ease of circulation and obtain high response rates. The online methodology of dissemination will also facilitate a broader demographic catchment. Therefore, achieving a more diverse geographical participation, thus reducing the potential bias and increasing the robustness of the data collated for statistical analysis. A QR code will also be created to gain access to the survey and will be printed on hard copy and circulated among community locations and online for ease of access. The survey will also be printed in hard copy format and located in community locations to avoid discriminating any cohorts which may not be as computer literate and to reach wider age range cohorts which may have a preference to complete the survey in hard copy format. The utilisation of both electronic and hard copy and multiple options to complete the survey in a variety of formats aims to reach as much of a wider demographic cohort as possible.

The survey will be circulated to the researcher's colleagues in the Health Research Board (upon approval of management and HR) through formal channels. The survey will be circulated amongst family, friends, community groups and LinkedIn connections. Former students from the post graduate class in Griffith College Dublin will be contacted. The survey will be circulated via email accompanied by the participant information leaflet and consent/preamble form and will be accessed via a link to the survey software.

The survey will encompass both qualitative and quantitative questions. This combined approach was selected to generate nuanced insights which will further support the statistical findings and enhance the authenticity of the data acquired. The quantitative component will be reflected by closed-ended questions which will be beneficial for performing the statistical analysis. The qualitative segment will comprise of 2 main open-ended questions and a of a smaller number of sub-open-ended questions throughout the survey. These sub-open-ended questions will be determined by the participants response to the previous question if it is applicable to provide further detail to their answer. These open-ended questions will facilitate deeper insights into the public's perceptions, awareness levels and potentials barriers to their use of AEDs. All participant responses will be anonymous and will not contain any identifying information or information which could be of ethical concern. Only that data that will be used to verify results (variation in IP addresses of participants will be collected and only for the purposes of verification). Any surveys completed on hard copy will be manually entered into the electronic survey to ease statistical analysis. The hard copies will be retained in a secure location only for the duration of the study. This storage is for reference purposes to demonstrate full transparency and authenticity in the data collection.

SECTION 2: POSSIBLE ETHICAL ISSUES

Answer 'yes' or 'no' to the following questions.

SUBJECT MATTER

Does the research proposal involve:

Research into specific company activities that would be deemed sensitive or confidential	**No**
Research into politically and/or racially/ethnically and/or commercially sensitive areas	**No**
Sensitive, personal, professional or corporate issues	**No**

RESEARCH PROCEDURES

Does the research proposal involve:

Research that might damage the reputation of companies or participants	**No**
Research that may negatively affect the reputation of Griffith College/Innopharma	**No**
Use of personal records without consent	**No**
Use of company data without consent	**No**
The offer of any inducements to participate	**No**
Audio or visual recording without consent	**No**
Using a language other than English	**No**

PARTICIPANTS

Does the research proposal involve:

People who are not competent and/or fluent in English	**No**
Does your research group include any of the following vulnerable groups	**No**

If you have answered NO to ALL questions, please go straight to Section 4.

If you have answered YES to ANY question in SECTION 2, you must fill in SECTION 3.

SECTION 3: STEPS TAKEN TO AVOID ETHICAL ISSUES

3.1. If your ethics relates to ***Subject Matter***, outline your action plan to work around any sensitive issues.
3.2. If your ethics relates to ***Research Procedures***, outline your action plan to deal with possible ethical issues in your research procedures.
3.3. If your ethics relates to ***Participants***, outline how you will protect vulnerable persons or those that do not have English as their first language.

SECTION 4: ABOUT YOUR PARTICIPANTS

4.1. Outline your participant profile and why you have chosen them for this study

The participant profile for this study is not restricted to any specifications apart from the participants location being within Ireland to reflect the study objectives. This research will recruit members of the general public in Ireland to gain recent reflection of public perceptions, attitudes and barriers to Automated External Defibrillator (AED) usage within Ireland. To gain this insight various locations and demographics will be targeted for the survey questionnaire completion. The survey will be circulated amongst friends, family, colleagues employment sectors as well as in various locations amongst the community and throughout Ireland . The survey will not contain any restrictions to gain as close as possible to an accurate representation of the current population in Ireland. The diversity in the participant profiles across various demographic cohorts could contribute to a deeper insight into factors potentially contributing to the awareness levels and barriers to use relating to AEDs.

4.2 How do you plan to gain access to/contact/approach your participant(s).

The researcher aims to approach potential participants through various communication channels. These include LinkedIn messages with access to various individuals across different locations and employment sectors. The researcher's professional network will be contacted through the circulation of a company-wide email post approval of HR and management of internal departments. Each department will be provided with a comprehensive and inclusive synopsis of the research study aims, objectives, methodology and survey outline. This collaborative approach will be utilised to facilitate full transparency within the company and gain support internally. The information provided to participants will provide reassurance relating to data circulation, collection and ensuring GDPR compliance. The researcher will obtain additional participants including family, friends and members of the community via WhatsApp and issuing emails via the assigned Griffith college email.

A QR code will also be created to gain access to the survey and will be printed on hard copy and circulated among community locations and online for ease of access. The survey will also be printed and located in community locations to avoid discriminating any cohorts which may not be as computer literate and to reach various age cohorts which may have a preference to complete the survey in hard copy format. The utilisation of both electronic and hard copy formats for the survey will aim to capture as much demographic cohort outreach as possible.

SECTION 5: INFORMATION, CONSENT AND CONFIDENTIALITY

5.1 **Participant Information Letter (PIL) for participants**

Please confirm below that your information letter covers:

Description of the research topic and method	**Yes**
Details of what participation will involve	**Yes**
Rights to anonymity	**Yes**
Confidentiality	**Yes**
Rights to withdraw from the research	**Yes**
The contact details of the researcher and supervisor (if necessary)	**Yes**

5.2 **Informed Consent Form (ICF) for participants**

Please indicate below if your research requires a signed consent form by selecting the relevant option only:

No: my research study involves an online survey only and hard copy but does not require signed consent. The participants will be presented with an outline of the research (Plain Language Statement and ethical/data provisions) in the preamble to the questionnaire and will be required to click a understand/consent button before they proceed.

SECTION 6: STORAGE OF DATA

[Please ensure that you are abiding by GDPR and the national Data protection laws https://www.hrb.ie/funding/gdpr-guidance-for-researchers/gdpr-and-health-research/).

6.1. How will you store the research data and for how long? How will you manage data protection issues?

The data collected resulting from this research study will be stored securely on password protected laptop which can only be accessed by the researcher. The laptop will be stored in a secure location where only the researcher will have access. Apart from the researcher the only other individuals who may have access to the data obtained are the researcher's supervisor and staff at Griffith College. All data is anonymised and no identifying data will be stored. The data will be retained for approximately 1 year post receipt of the Master's Degree. The final submission of this data will occur in August 2025. All data collated will be destroyed when it reaches the maximum retention timeframe.

SECTION 7: NON-DISCLOSURE AGREEMENT & STUDENT CONSENT

7.1 **Non-Disclosure Agreement (NDA)**

Will the final dissertation contain any information pertaining to any source what would warrant the use of a Non-Disclosure Agreement (NDA) e.g. industry-based research?

No

7.2 **Student consent**

If a Non-Disclosure Agreement (NDA) is not required, does the Student consent to allow their completed dissertation to be held/published by Innopharma/Griffith College?

Yes

SECTION 8: RECORDING AND RETENTION OF DISSERTATION VIVA

8.1 **Viva Recording**
The Dissertation viva will be recorded. This recording may be used to facilitate assessment by Innopharma staff, a third reader if necessary and/or if requested by the external examiner for the Programme. The recording will be held in line with current GDPR guidelines and will not be made publicly available.

SECTION 9: DOCUMENT CHECKLIST

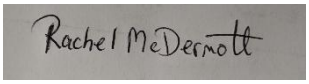
NOTE: Applicants must attach the following documents in electronic format to the appendix.

Which documents are added to the appendix? Please tick N/A if not applicable:

9.1 Participant Information Letter (PIL) for participant	**Yes**
9.2 Informed Consent Form (ICF) for participant	**Yes**
9.3 Questions/survey for interviewees/focus groups etc *(can be in draft form)*	**Yes**
9.4 Any other documents e.g. Non-Disclosure Agreement	**N/A**

I confirm that this application is complete and all required documents are included in the appendix.

For Student:

STUDENT SIGNATURE: 

DATE: 14th May 2025

Appendix 4 – Preamble/ Informed Consent Form

GRIFFITH COLLEGE

Survey Preamble (consent) to take part in research

Utilisation of Automated External Defibrillators (AEDs) in Ireland: A quantitative and qualitative analysis of awareness, confidence and barriers to AED use in 2025.

The researcher retains one copy signed by both themselves and the participant. The participant should also receive a copy of consent form as a record of what they have signed up to.

- I [*insert participant name*] voluntarily agree to participate in this research study
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind
- I understand that I can withdraw permission to use data from my survey within two weeks after the interview, in which case the material will be deleted.
- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study
- I understand that participation involves assessing perception, awareness and barrier to use of Automated External Defibrillators (AEDs).
- I understand that I will not benefit directly from participating in this research
- I understand that all information I provide for this study will be treated confidentially
- I understand that if I inform the researcher that myself or someone else is at risk of harm, they may have to report this to the relevant authorities - they will discuss this with me first but may be required to report with or without my permission
- I understand that signed consent forms and surveys will be retained on a password-protected laptop, accessible only to the researcher. When the laptop is not in use, it will be stored in a locked room, accessible again only to the researcher. Raw data will be shared only with the relevant supervisor. Obtained data should be retained for a maximum period of 1-year following awarding of the MSc qualification.
- I understand that under freedom of information legalisation I am entitled to access the information I have provided at any time while it is in storage as specified above.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Researcher Details

Researcher's Name: Rachel McDermott

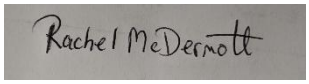
Degree Programme: Master of Science in Medical Device Technology and Business

College Details: Griffith College Dublin

Contact Number: 0873110654

Contact Email: rachel.mcdermott@student.griffith.ie

RACHEL MCDERMOTT



Appendix 5 – Participant Information Letter (PIL)

GRIFFITH COLLEGE

Participant Information Letter

Dear Participant,

My name is Rachel McDermott and I am delighted to invite you to participate in a research study. The study is aimed at understanding the awareness and barriers of AED (defibrillator) use among the public in Ireland. This study is being conducted as part of my Master of Science in Medical Device Technology and Business being undertaken at Griffith College Dublin.

Your participation in this study will involve completing a short questionnaire to assess your level of awareness of defibrillators (AEDs) and possible barriers which may hinder you from using a defibrillator. The survey will largely consist of closed-ended (tick-box type) questions and a small number of open-ended questions.

You have been invited to participate because your insights are valuable for understanding the level of awareness among the general public. Participation in this study is completely voluntary, and you have the right to refuse participation, decline to answer any question, or withdraw at any time without facing any consequences.

There are no direct benefits to you for participating in this study. However, your input will contribute to research aimed at improving awareness and training for AED use. This information you will provide may assist in informing future practice, which may ultimately enhance patient safety and life-saving AED placement and use. All information provided by you will be kept strictly confidential. Any identifiable information will be removed from the data collected to ensure anonymity. Data will be stored securely and only accessible to the researcher and relevant College staff. If you require further information or have any questions

about the study, please feel free to contact Rachel McDermott at Griffith College Dublin via rachel.mcdermott@student.griffith.ie.

Thank you for considering participation in this study.

Researcher's Name: Rachel McDermott

Degree Programme: Master of Science in Medical Device Technology and Business

College Details: Griffith College Dublin

Contact Number: 0873110654

Contact Email: rachel.mcdermott@student.griffith.ie

[THANK YOU]

Appendix 6 – Literature Review Resource table

Websites & Organisational Resources

The table below contains 18 website sources, organisational reports, news articles, and informational resources from various Irish and international organisations.

Year	Author	Title	Aims & Methodology	Conclusions
2025	Become CFR.ie	What Is a CFR – Becomeacfr.Ie | National Ambulance Service	This is an information resource explaining the Community First Responder (CFR) roles and responsibilities.	The resource defines the CFR role and outlines how the community members can become trained first responders to support emergency services.
2025	Become CFR.ie, N.A.S.	About PAD Schemes – Becomeacfr.Ie | National Ambulance Service	Information about Public Access Defibrillation (PAD) schemes across Ireland.	Explains PAD programmes structure, registration process, and community benefits of public AED placement.
2021	Gaa.ie	GAA Launch Community Heart Programme	This is an announcement of GAA's community cardiac safety initiative.	It launched a comprehensive programme to improve the cardiac emergency response in GAA clubs through AED provision and training.
2025	Heartsafety Solutions	GAA Defibrillator Programme -	This is a commercial training provider of information for GAA	It offers specialised AED training services tailored

		Defibrillator Training	defibrillator programmes.	for GAA clubs and sports organisations.
2024	HIQA	Health Technology Assessment (HTA) of Public Access Defibrillation	The Health technology Assessment (HTA) report evaluates the public access defibrillation programmes.	It provided evidence-based recommendations for cost-effective implementation of public AED programmes in Ireland.
2014	HIQA	HIQA Publishes Assessment of Providing Defibrillators in Public Places	News release about HIQA's assessment of public defibrillator programmes.	This assessment announced the publication of the assessment supporting the strategic placement of defibrillators in high-traffic public locations.
2024	HSE	HSE National Ambulance Service Publishes 2023 Out-of-Hospital Cardiac Arrest Register	Press release announcing the publication of 2023 OHCA statistics.	Highlighted key statistics and trends in OHCA cases and outcomes in Ireland.
2025	Irish Heart Foundation	AEDs / Defibrillators Save Lives	Educational resource about the importance of AEDs and CPR training.	Promotes public awareness of AED life-saving potential and encourages CPR/AED training participation to the public.
2018	Irish Heart Foundation	Beware of 'Cough CPR'	Public health warning about ineffective CPR techniques.	Warned against dangerous misinformation about "cough CPR" and emphasised the correct CPR training importance.
2023	Irish Red Cross	First Aid Courses - Irish Red Cross	Training programme information for first aid and CPR courses.	Provides accessible first aid training options including CPR and AED use for the community members.
2006	Lairdesign	The Cormac Trust	Charitable organisation promoting cardiac safety awareness.	Established to raise awareness about sudden cardiac death and promote AED availability within communities.
2015	National Ambulance Service	National AED Network - National	Information about Ireland's national AED	Explains the AED registration process and network benefits for

		Ambulance Service	network and registration system.	emergency service coordination.
2025	Open Street Map Ireland	AED Defibrillator Mapping	Community mapping project for AED locations.	Provides crowd-sourced mapping of AED locations to improve public access and emergency responses.
2015	Ring, E.	900 Poorly-Maintained Irish Defibrillators 'May Not Work Properly'	News article reporting on AED maintenance issues.	Highlighted the critical maintenance problems with registered AEDs, emphasising the need for regular servicing and monitoring.
2019	Shannon	Irish Heart CPR Rates Increase as More People Attempt to Save Lives	News article about improving CPR intervention rates.	Reported positive trends in bystander CPR rates and community willingness to intervene in cardiac emergencies.
2019	Shannon, J.	Irish Heart Foundation to Create Nation of Life Savers	A press release about the national CPR training initiative.	Announced ambitious programme to train large numbers of citizens in Ireland in life-saving CPR skills.
2022	Shannon, J.	Scrap VAT on AEDs and Publish Stroke Strategy	An advocacy article calling for policy changes.	Advocated for the removal of VAT on AEDs and the publication of national stroke strategy to improve cardiac care.
2021	Slater, S.	Four in Five Sports Clubs Not Confident in Use of Defibrillators - Study	News article reporting on sports club AED confidence study.	Highlighted significant confidence gaps in AED use among sports club members despite device availability.

Scientific Articles & Studies

The table below contains 14 peer-reviewed research studies, systematic reviews, and formal reports with clear methodological approaches and research conclusions.

Year	Author	Title	Aims & Methodology	Conclusions

2023	AlRadini, F.A. et al.	Application of Automated External Defibrillators Among the Public: A Cross-Sectional Study of Knowledge, Attitude, Practice, and Barriers of Use in Saudi Arabia	This cross-sectional study examines public knowledge, attitudes, practices, and barriers regarding AED use in Saudi Arabia	The author identifies significant knowledge gaps and barriers to AED use among the Saudi public, highlighting the need for enhanced training and awareness programmes.
2024	Barry, T. et al.	Bystander Defibrillation for Out-of-Hospital Cardiac Arrest in Ireland	This observational study analyses the bystander defibrillation rates and outcomes in Irish out-of-hospital cardiac arrest (OHCA) cases.	The study demonstrated the critical importance of the bystander defibrillation in improving survival rates from out-of-hospital cardiac arrest across Ireland.
2023	Barry, T. et al.	Outcomes of Out-of-Hospital Cardiac Arrest in Ireland 2012-2020: Protocol for an Observational Study	This protocol paper outlines the methodology for the observational study of OHCA outcomes in Ireland over an 8-year duration.	The study investigates the established framework for the comprehensive analysis of OHCA outcomes and survival factors in the Irish healthcare system.
2023	Daud, A. et al.	Factors and Barriers on Cardiopulmonary Resuscitation and Automated External Defibrillator Willingness to Use among the Community: A 2016–2021 Systematic Review and Data Synthesis	Systematic review synthesising data on the community willingness to use CPR and AEDs, analysing the factors and barriers (2016-2021).	This study identifies common barriers including the fear of harm, lack of training, and legal concerns; the emphasised requirement for targeted community education programmes.
2023	Hunt, M., Wilkinson, C. and McColl, E.	Awareness and Confidence of Use of Automated External	This cross-sectional intercept study assesses the AED awareness and confidence among	Found low confidence levels in AED use despite reasonable awareness, indicating the necessity

		Defibrillators on Newcastle University Campus: A Cross-Sectional Intercept Study	Newcastle University campus community.	for hands-on training programmes.
2025	Kern, M. et al.	Advancements in Public First Responder Programs for Out-of-Hospital Cardiac Arrest: An Updated Literature Review	The literature review examines the recent advancements in the public first responder programmes for OHCA.	Highlighted emerging technologies and programme innovations that improve the first responder effectiveness and the community engagement.
2024	Kono, H. et al.	Bystanders' Willingness to Assist Using Automated External Defibrillators during Cardiac Arrest	Study investigating factors influencing bystander willingness to use AEDs during cardiac emergency situations.	Identified key predictors of willingness including training, confidence, and perceived responsibility; emphasising the importance of community preparation.
2021	Lee, J.H. et al.	Public Awareness and Willingness to Use Automated External Defibrillators in a Metropolitan City	Cross-sectional study examining public awareness and willingness to use AEDs in a metropolitan setting.	Found moderate awareness but low willingness to use AEDs, with training identified as a primary factor for improving confidence levels.
2023	National Ambulance Service	OHCAR Annual Report 2023	The annual report presents a statistical analysis of out-of-hospital cardiac arrest cases within Ireland for 2023.	Provided comprehensive data on OHCA incidences, response times, and survival rates; identifying the areas for improvement in an emergency response.
2021	Pei-Chuan Huang, E. et al.	Barriers to Bystanders Defibrillation: A National Survey on Public Awareness and Willingness of Bystanders Defibrillation	National survey investigating barriers to bystander defibrillation and the levels of public awareness.	Identified fear of causing harm and lack of knowledge as primary barriers; the recommendations include comprehensive public education strategies.
2017	Ryan, P. and Falvey, E.	Assessment of Existing	Systematic review evaluating layperson	Revealed substantial knowledge deficits

		Layperson Knowledge on the Role and Use of an AEDs in Amateur Sports Clubs: A Systematic Review of the Literature	knowledge of AED use in amateur sports club settings.	among sports club members, despite high AED availability in sporting environments.
2021	Ryan, P., Twomey, G. and Falvey, É.	Assessment of Layperson Knowledge of AED Use in Sports Clubs	Study assessing AED knowledge among laypersons in Irish sports clubs.	Identified poor knowledge levels despite the presence of AEDs, highlighting the need for mandatory training in sports organisations.
2024	Yonis, H.G.H. et al.	Understanding Barriers to Bystander Use of Automated External Defibrillators (AEDs) in Cardiac Arrest: A Cross-Sectional Survey in North Carolina	Cross-sectional survey examining barriers to AED use among potential bystanders within North Carolina.	Identified training inadequacies, fear of legal consequences, and device unfamiliarity as major barriers to AED utilisation.
2024	Zahra, S.A. et al.	Health Inequalities in Cardiopulmonary Resuscitation and Use of Automated Electrical Defibrillators in Out-of-Hospital Cardiac Arrest	A study examining health inequalities in CPR and AED use during OHCAs across different demographic groups.	Revealed significant disparities in CPR and AED use based on the socioeconomic status, race, and geographic locations, highlighting the need for more targeted interventions.

Appendix 7 – Comparative analysis table for OHCA survival rates using AEDs

Country	**OHCA Survival rate**	**Initiatives**	**Gaps**
Ireland	8.4%	National AED registry, VAT reduction, Community groups, School training, Irish OHCAR registry	Urban- rural disparity = slower EMS arrival time, Lower than EU average

Norway	25%	Strong public awareness campaigns, high rates of CPR, Systematic integration of CPR protocols into EMS, mandatory school training	High baseline makes further improvement challenging, Geographic challenges in remote areas, Cost of maintaining comprehensive coverage
USA	11%	Rapid response paramedic services, widespread availability & increasing intervention rates	Geographic disparities, inconsistent Good Samaritan laws
China	0.6-0.8%	BASIC-OHCA registry established, Legislative efforts for bystander CPR, Increasing AED deployment, Enhanced 911 systems	Very low bystander CPR rates, Limited public awareness, Late EMS response times
Sweden	10-15%	Drone AED delivery, Effective emergency response systems & high public awareness, SMS alert system for trained responders	Rural coverage challenges, Maintaining volunteer responder networks, Weather-related response delays
Australia	12%	High prevalence of AEDs in public places, robust EMS & continues education re AEDs, Aus-ROC registry	Vast geographic distances, Remote area coverage, Indigenous community access disparities
New Zealand	12%	National OHCA registry, standardized reporting, continuous improvement programmes	Variable regional performance
Japan	8-10%	High prevalence of AEDs in public places, robust EMS & continues education re AEDs, Public Access Defibrillation programmes	Aging population challenges, Cultural barriers to bystander intervention, Language barriers for tourists
Germany	9-13%	Effective training programmes, Timely EMS	Regional variations in training quality, Bystander hesitation despite training, Integration challenges across federal states

European average = 9.2%

Appendix 8- Comparative analysis table of International AED deployment

Country	Priority Area	Key Features	Implementation Approach	Recommended Irish Action
Ireland	Community-driven public access initiative	HSE guidance framework; strong community engagement; growing public building adoption	Collaborative approach with HSE support, community organizations, and private sector partnerships	Enhance existing community networks with integrated registration system and expanded placement programmes
Canada	EMS-integrated database	Mandatory AED registration with Heart and Stroke Foundation	EMS dispatchers provide real-time location access during emergencies	Implement mandatory AED registration accessible to emergency dispatchers
France	universal public access mandate	Comprehensive public establishment mandates	National location database for emergency coordination	Expand beyond current 43,000 facilities to all public establishments
Portugal	clear layperson authorization	Legal framework since 2009/2012	Layperson operation authorized; mandatory for critical infrastructure (airports, ports, shopping centres)	Strengthen legal framework with defined training requirements
USA	comprehensive legislation model	Federal guidance with comprehensive legislation	Jurisdiction-specific laws with liability protection and quality improvement measures	Establish specific placement mandates, maintenance protocols, and liability protection

Appendix 9 - Comparative analysis table of International AED legislation

Country	Legislative Framework	Key Features	Implementation Approach	Scope and Coverage
Canada	Provincial legislation (e.g., Defibrillator Public Access Act, Manitoba)	Mandatory AED registration with Heart and Stroke Foundation	EMS dispatchers provide real-time location access during emergencies	Targeted regulatory approaches through provincial systems
France	Comprehensive regulatory proposals for public establishments	Mandatory AED installation in all public-access establishments; national location database	Implementation conditions defined through statutory instruments	All public-access establishments with emergency response coordination
Portugal	Legal framework established 2009, expanded 2012	Authorizes trained laypersons to operate AEDs; mandatory programs for critical infrastructure	Layperson operation authorized with training requirements	Airports, commercial ports, retail centres, transportation terminals
Spain	Early regulatory foundations (2009)	Thirteen autonomous communities with specific AED legislation	Jurisdiction-specific laws within autonomous communities	Regional approach across autonomous communities
United States	Cardiac Arrest Survival Act 2000 (HR 2498), comprehensive legislation by 2010	Federal guidance with comprehensive state legislation covering placement, training, maintenance, coordination,	All jurisdictions with detailed regulatory frameworks	Government facilities expanding to comprehensive coverage across all jurisdictions

Country	Legislative Framework	Key Features	Implementation Approach	Scope and Coverage
		quality improvement, liability protection		
Ireland	The Public Health (Availability of Defibrillators) Bill 2013	Comprehensive requirements for installation, maintenance, signage, and staff training	Broader sectoral approach across diverse premises categories	

Appendix 10 – Participant Recruitment Poster

IT'S SHOCKING!!

https://www.surveymonkey.com/r/S9YBMPF

Closing Date: 25th July 2025

What do you know about Defibrillators?
Scan the QR code or use the link to take part in vital defibrillator research

Griffith College

This survey is part of a masters degree thesis with Griffith College Dublin.

Quick & Easy
Takes only 5-10 minutes of your time

Who Can Participate?
Anyone 18+ living in Ireland - no medical experience needed!

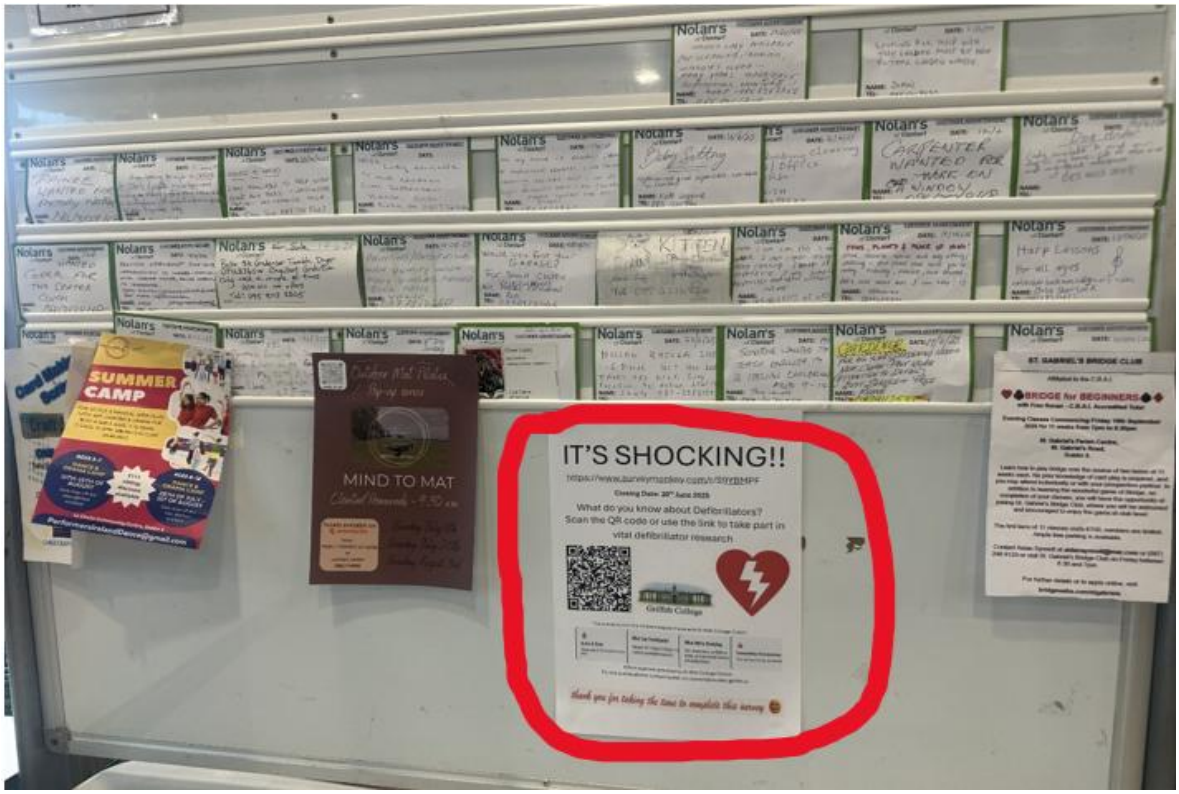
What We're Studying
Your awareness, confidence levels, and perceived barriers with defibrillators

Completely Anonymous
Your privacy is fully protected

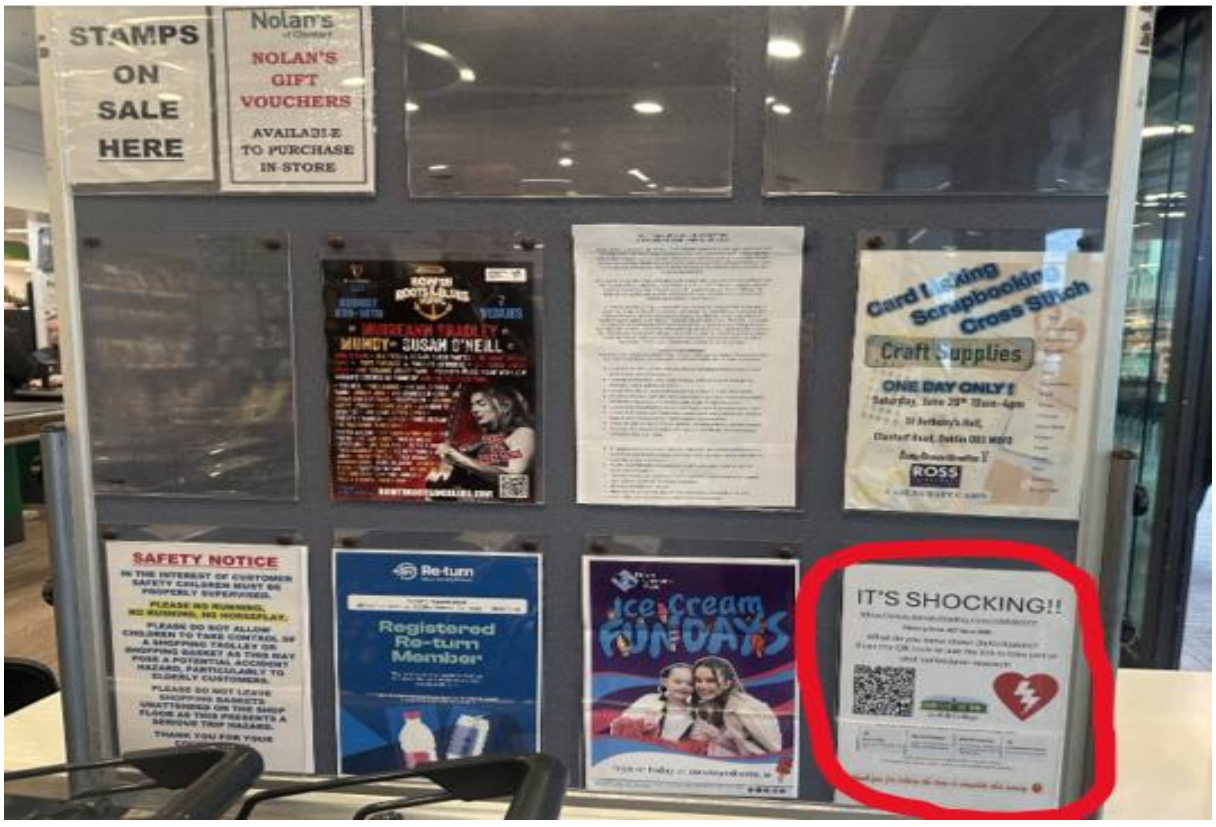
Ethics approval provided by Griffith College Dublin.
For any queries please contact rachel.mcdermott@student.griffith.ie

thank you for taking the time to complete this survey 😊

Appendix 11 – Participant Recruitment Poster Placement



Survey Poster on Nolans supermarket Clontarf Noticeboard 1

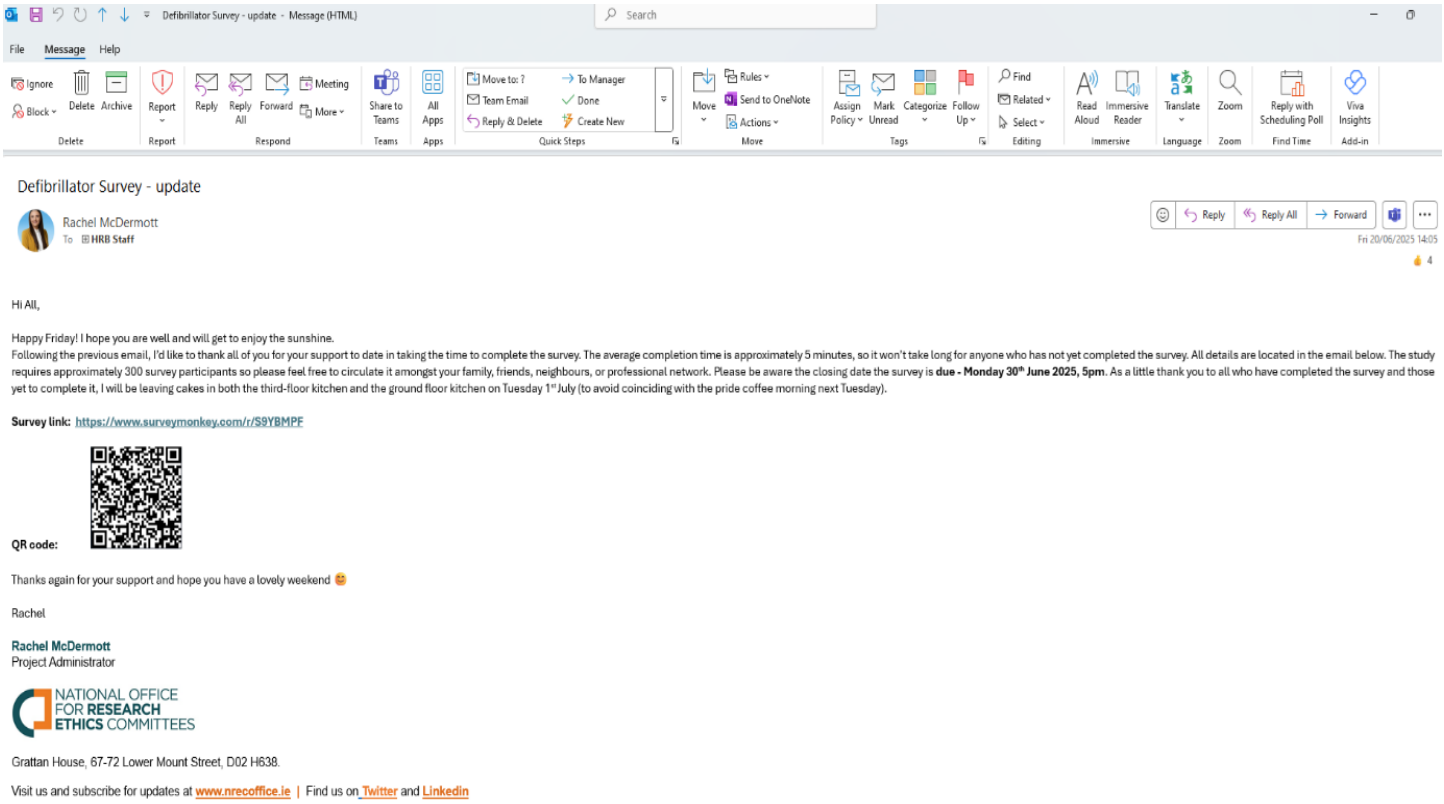


Survey Poster on Nolans supermarket Clontarf Noticeboard 2

Survey Poster on Health Research Board's Noticeboard

Survey Poster located on the corridor of each floor of the Health Research Board building

Appendix 12– Survey Participant Email Invitation



Defibrillator Survey - update - Message (HTML)

Search

File Message Help

Ignore Block Delete Archive Report Reply Reply All Forward Meeting More Share to Teams All Apps Move to: ? Team Email Reply & Delete To Manager Done Create New Move Rules Send to OneNote Actions Assign Policy Mark Unread Categorize Follow Up Find Related Select Read Aloud Immersive Reader Translate Zoom Reply with Scheduling Poll Viva Insights

Delete Report Respond Teams Apps Quick Steps Move Tags Editing Immersive Language Zoom Find Time Add-in

Defibrillator Survey - update

Rachel McDermott
To HRB Staff

Reply Reply All Forward

Fri 20/06/2025 14:05

4

Hi All,

Happy Friday! I hope you are well and will get to enjoy the sunshine.
Following the previous email, I'd like to thank all of you for your support to date in taking the time to complete the survey. The average completion time is approximately 5 minutes, so it won't take long for anyone who has not yet completed the survey. All details are located in the email below. The study requires approximately 300 survey participants so please feel free to circulate it amongst your family, friends, neighbours, or professional network. Please be aware the closing date the survey is **due - Monday 30th June 2025, 5pm**. As a little thank you to all who have completed the survey and those yet to complete it, I will be leaving cakes in both the third-floor kitchen and the ground floor kitchen on Tuesday 1st July (to avoid coinciding with the pride coffee morning next Tuesday).

Survey link: https://www.surveymonkey.com/r/S9YBMPF

QR code:

Thanks again for your support and hope you have a lovely weekend

Rachel

Rachel McDermott
Project Administrator

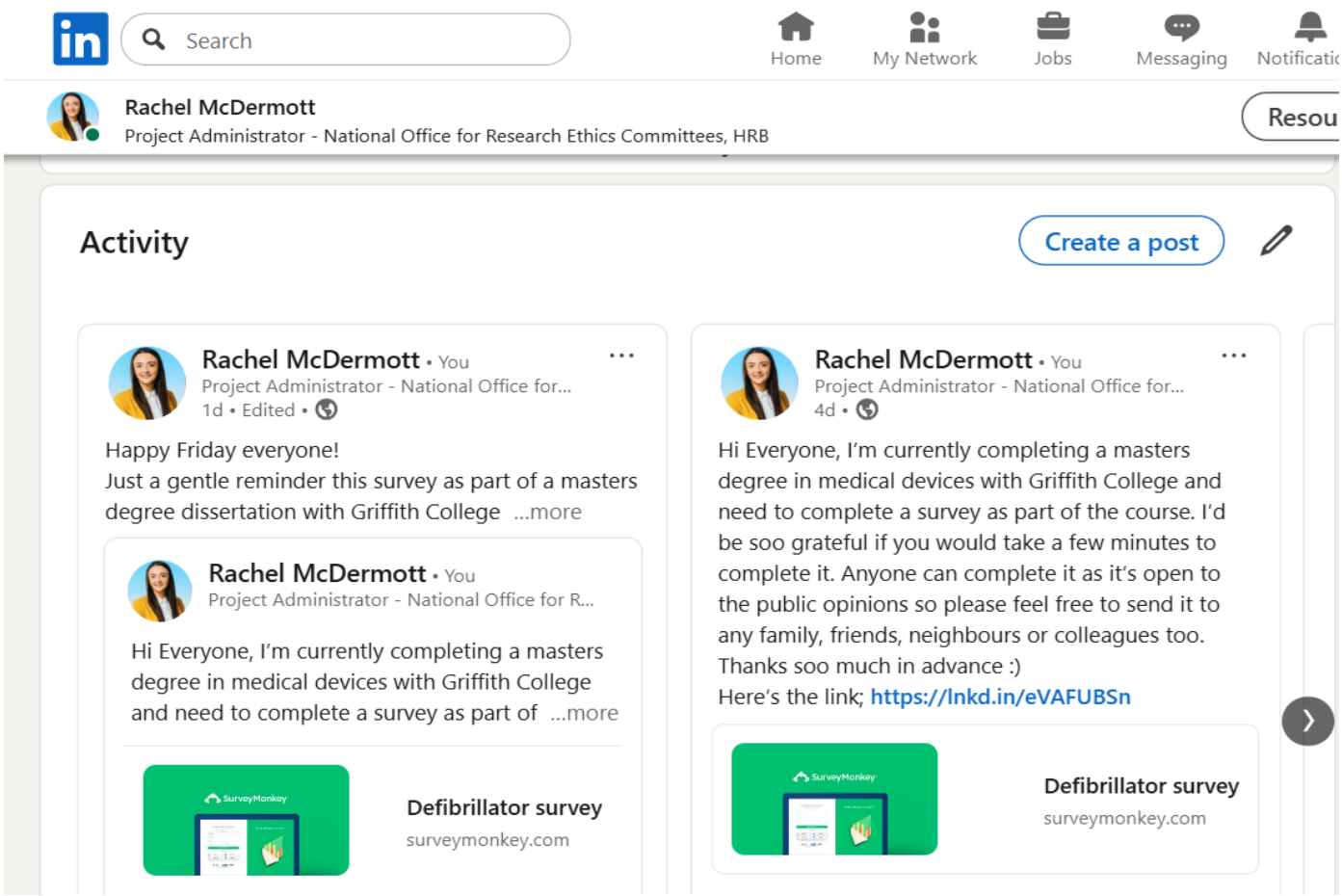
NATIONAL OFFICE FOR RESEARCH ETHICS COMMITTEES

Grattan House, 67-72 Lower Mount Street, D02 H638.

Visit us and subscribe for updates at www.nrecoffice.ie | Find us on Twitter and Linkedin

Staff email circulation within the Health Research Board regarding survey participation invitation

Appendix 13 – Social media survey invitation post



LinkedIn post and re-post regarding survey participation invitation

Appendix 14 – Artificial Intelligence (AI) utilisation

The study required extensive data collection and critical evaluation of existing literature. The use of Artificial Intelligence (AI) platforms was implemented for numerous features throughout the composition of this dissertation. The software was consulted for provision of survey formats at the infancy stage of the dissertation process to assess the best layout and potential questions which could be relevant to the study. An example of this is the possible formats the questions are asked to the survey participants. This includes the provision of examples such as the age ranges or the option to type the number into a text box. The software consulted include Claude, Perplexity and chatbox AI. The bubbles indicating details regarding the survey duration, anonymity, study purpose and eligibility criteria used, were sourced and tailored to the study using AI graphical designs. The thank you banner on the survey was also generated in this manner. The AI softwares were used to provide a condensed summary of some concepts or examples specific to the dissertation to further the researchers understanding after reviewing the literature resources. This facility provided a lay condensed summary of the literature reviewed as a

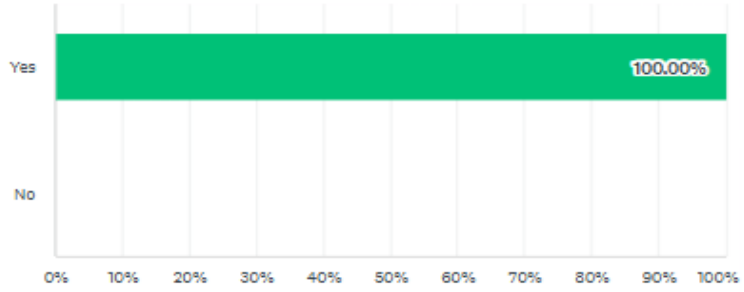
prompt for the key points required to incorporated into the dissertation write up. The AI software was also used for assisting in rephrasing sentences to enhance their clarity, improve phrasing, grammar and logical flow. While AI was used to source ideas and information the information provided was verified through sourcing the relevant information from the scientific literature and critically analysing the information from the researcher's perspective. All the final content, interpretations, and conclusions presented in this dissertation remain the original intellectual work and responsibility of the researcher.

Appendix 15 – Survey Monkey Data Analysis Diagrams

Q1

I have read and understand the information below.Consent Research Title: Public Perceptions and Utilisation of Automated External Defibrillators(AEDs) in Ireland: A quantitative and qualitative analysis of awareness, confidence and barriers to AED use in 2025.Aim: to investigate the association between the public demographics (e.g. age, education level, etc.) and their knowledge of AEDs.Participant's consent:· Your participation is voluntary· You have the right to refuse completing this survey at any timeParticipant's data:· Any obtained data will be used for research purposes only· All responses will remain anonymous and confidential· Data will be retained for a maximum duration of 1 year post final submission of the master's degree in August 2025· Data will strictly adhere to GDPR legislationResearcher's contact details:rachel.mcdermott@student.griffith.ie

Answered: 385 Skipped: 0



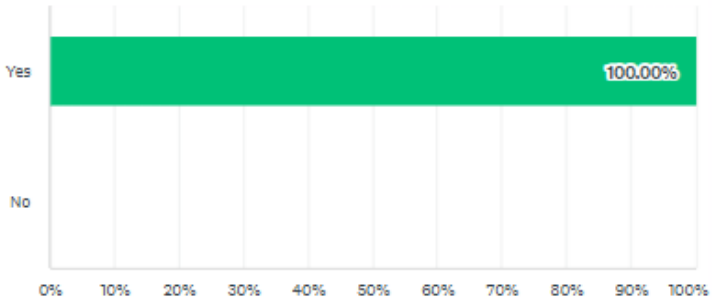
ANSWER CHOICES	RESPONSES	
Yes (1)	100.00%	385
No (2)	0.00%	0
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	1.00	1.00	1.00	0.00

Q2

I consent to participating in this study and meet the criteria points listed below;· I am fluent in English· I understand the purpose of this survey· I consent to my information being used only for the purposes of this survey & study· I consent to participate in this survey

Answered: 385 Skipped: 0



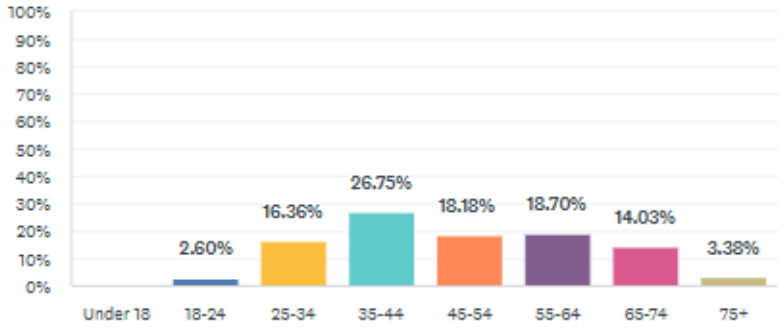
ANSWER CHOICES	RESPONSES	
Yes (1)	100.00%	385
No (2)	0.00%	0
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	1.00	1.00	1.00	0.00

Q3

Age

Answered: 385 Skipped: 0



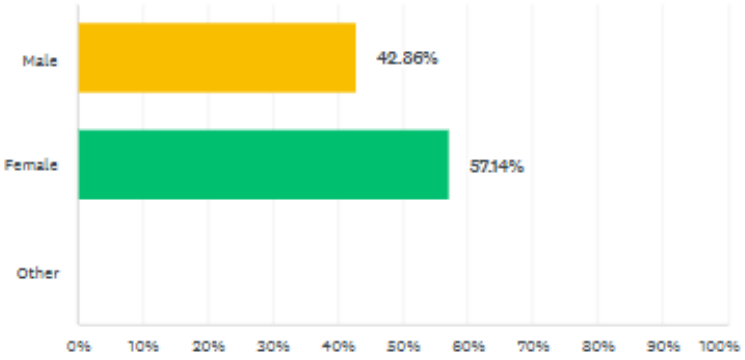
ANSWER CHOICES	RESPONSES	
Under 18 (1)	0.00%	0
18-24 (2)	2.60%	10
25-34 (3)	16.36%	63
35-44 (4)	26.75%	103
45-54 (5)	18.18%	70
55-64 (6)	18.70%	72
65-74 (7)	14.03%	54
75+ (8)	3.38%	13
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
2.00	8.00	5.00	4.90	1.48

Q4

Gender

Answered: 385 Skipped: 0



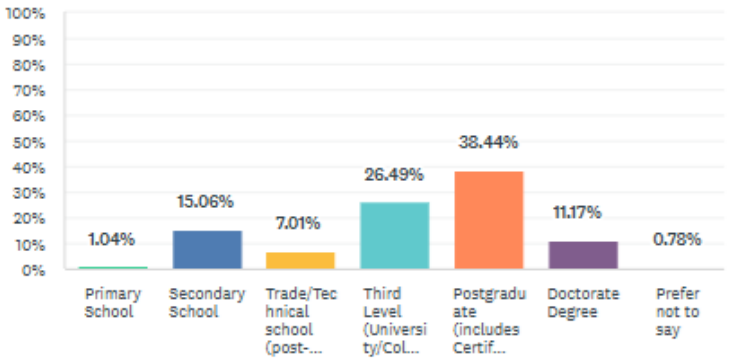
ANSWER CHOICES	RESPONSES	
Male (1)	42.86%	165
Female (2)	57.14%	220
Other (3)	0.00%	0
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.57	0.49

Q5

Completed education level

Answered: 385 Skipped: 0



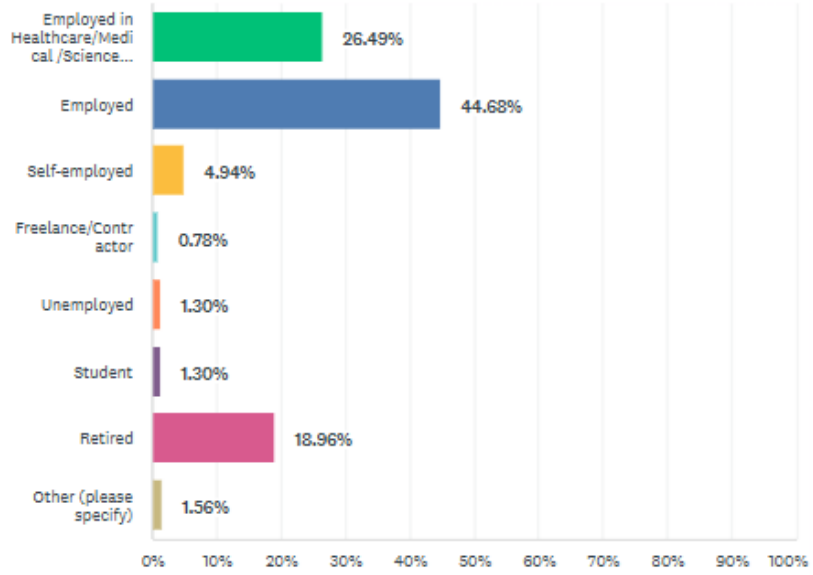
ANSWER CHOICES	RESPONSES	
Primary School (1)	1.04%	4
Secondary School (2)	15.06%	58
Trade/Technical school (post-leaving certificate course) (3)	7.01%	27
Third Level (University/College/Institute) (4)	26.49%	102
Postgraduate (includes Certificate, Diploma, Masters) (5)	38.44%	148
Doctorate Degree (6)	11.17%	43
Prefer not to say (7)	0.78%	3
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	7.00	5.00	4.23	1.27

Q6

Employment Status

Answered: 385 Skipped: 0

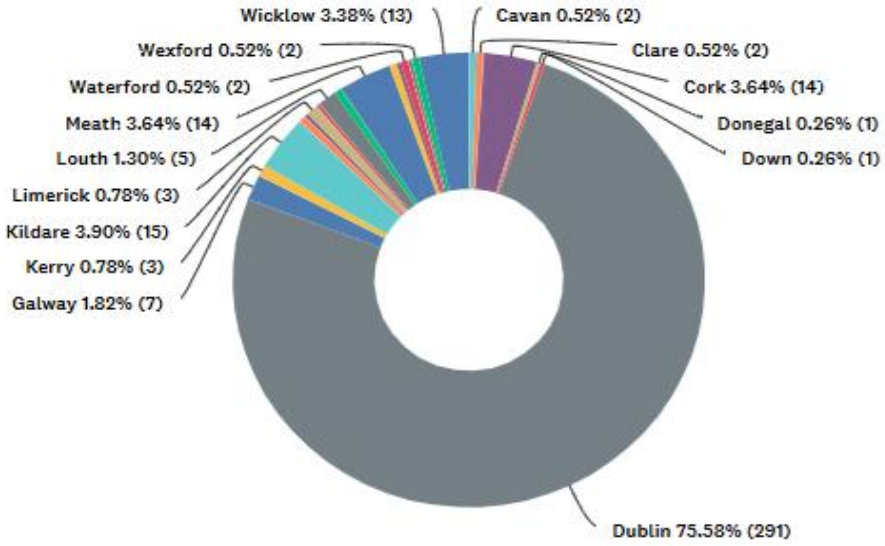


ANSWER CHOICES		RESPONSES	
Employed in Healthcare/Medical /Science related field (1)		26.49%	102
Employed (2)		44.68%	172
Self-employed (3)		4.94%	19
Freelance/Contractor (4)		0.78%	3
Unemployed (5)		1.30%	5
Student (6)		1.30%	5
Retired (7)		18.96%	73
Other (please specify) (8)	Responses	1.56%	6
TOTAL			385

Q7

Location

Answered: 385 Skipped: 0



ANSWER CHOICES	RESPONSES	
Antrim	0.00%	0
Armagh	0.00%	0
Carlow	0.00%	0
Cavan	0.52%	2
Clare	0.52%	2
Cork	3.64%	14
Derry	0.00%	0
Donegal	0.26%	1
Down	0.26%	1
Dublin	75.58%	291
Fermanagh	0.00%	0
Galway	1.82%	7
Kerry	0.78%	3
Kildare	3.90%	15
Kilkenny	0.52%	2
Laois	0.26%	1
Leitrim	0.00%	0
Limerick	0.78%	3
Longford	0.26%	1
Louth	1.30%	5
Mayo	0.52%	2
Meath	3.64%	14
Monaghan	0.52%	2
Offaly	0.00%	0
Roscommon	0.00%	0
Sligo	0.26%	1
Tipperary	0.00%	0
Tyrone	0.00%	0
Waterford	0.52%	2
Westmeath	0.26%	1
Wexford	0.52%	2
TOTAL		385

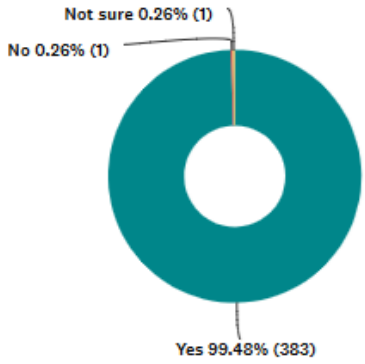
BASIC STATISTICS

Minimum	Maximum	Median	Mean	Standard Deviation
4.00	32.00	10.00	11.87	5.42

Q8

Have you ever seen or heard of a 'Defibrillator' also known as an Automated External Defibrillator (AED)?

Answered: 385 Skipped: 0



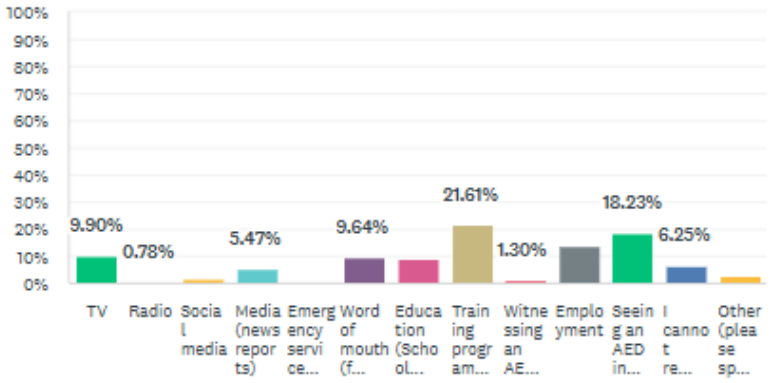
ANSWER CHOICES	RESPONSES	
Yes (1)	99.48%	383
No (2)	0.26%	1
Not sure (3)	0.26%	1
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	1.00	1.01	0.11

Q9

If yes, where did you first see/hear about Defibrillators (AEDs)? (select one option)

Answered: 384 Skipped: 1



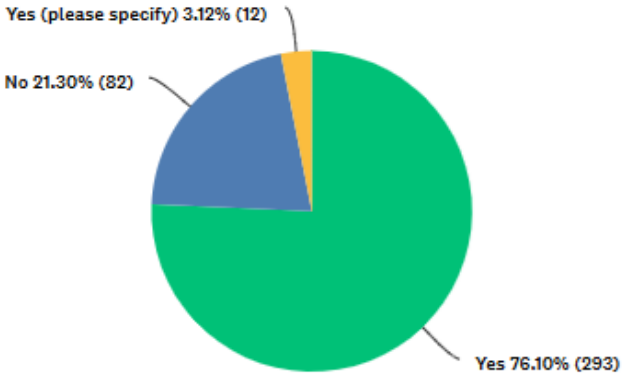
ANSWER CHOICES		RESPONSES	
TV (1)		9.90%	38
Radio (2)		0.78%	3
Social media (3)		1.56%	6
Media (news reports) (4)		5.47%	21
Emergency services advert (5)		0.26%	1
Word of mouth (family, friend or colleague) (6)		9.64%	37
Education (School or University) (7)		8.85%	34
Training programme (eg. CPR/AED training) (8)		21.61%	83
Witnessing an AED being used (in real life) (9)		1.30%	5
Employment (10)		13.80%	53
Seeing an AED in an everyday location (shop, sports club, etc) (11)		18.23%	70
I cannot recall (12)		6.25%	24
Other (please specify) (13)	Responses	2.60%	10
TOTAL			384

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	13.00	8.00	7.89	3.27

Q10

Do you know where any (at least one or more) Defibrillators (AED) are located in your community?

Answered: 385 Skipped: 0



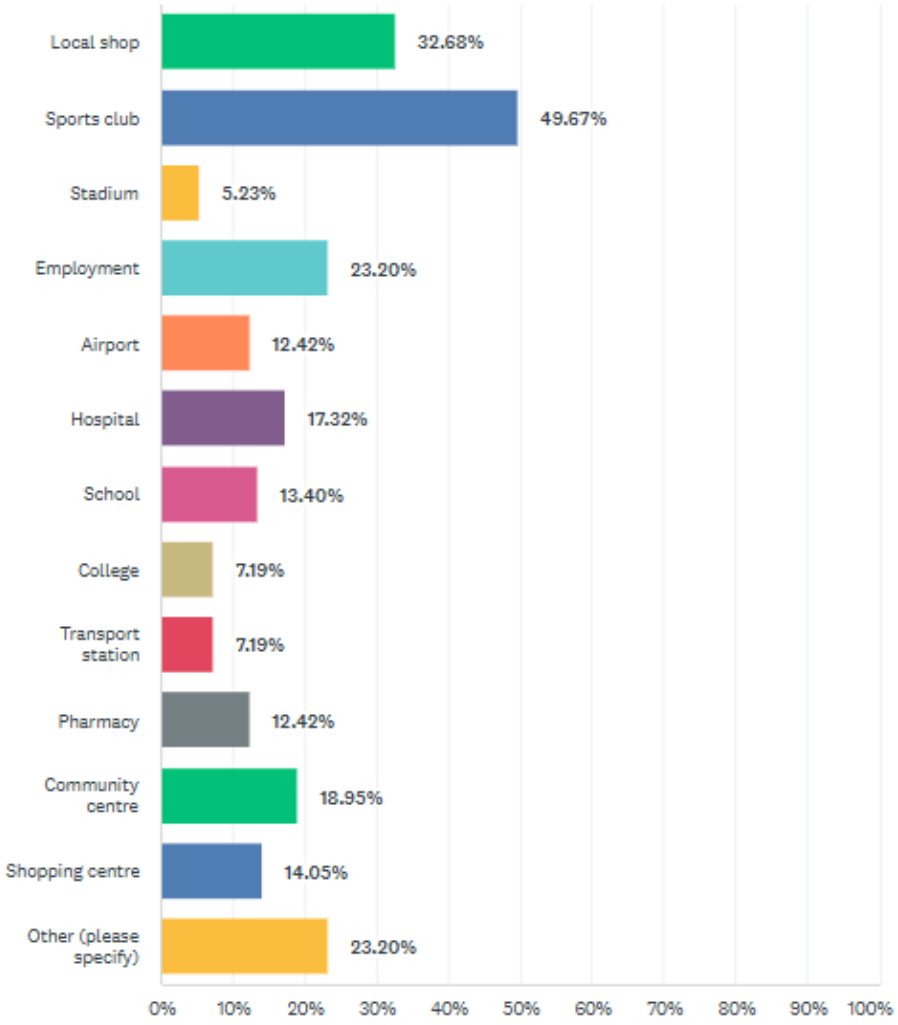
ANSWER CHOICES		RESPONSES	
Yes (1)		76.10%	293
No (2)		21.30%	82
Yes (please specify) (3)	Responses	3.12%	12
TOTAL			385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	1.00	1.27	0.61

Q11

If yes, please specify where (please tick all that apply)

Answered: 306 Skipped: 79



ANSWER CHOICES		RESPONSES	
Local shop (1)		32.68%	100
Sports club (2)		49.67%	152
Stadium (3)		5.23%	16
Employment (4)		23.20%	71
Airport (5)		12.42%	38
Hospital (6)		17.32%	53
School (7)		13.40%	41
College (8)		7.19%	22
Transport station (9)		7.19%	22
Pharmacy (10)		12.42%	38
Community centre (11)		18.95%	58
Shopping centre (12)		14.05%	43
Other (please specify) (13)	Responses	23.20%	71
Total Respondents: 306			

BASIC STATISTICS

Minimum	Maximum	Median	Mean	Standard Deviation
1.00	13.00	5.00	6.02	4.20

Q12

Have you ever had previous medical training? (eg. First aid, Cardiopulmonary Resuscitation (CPR), Defibrillator training)

Answered: 385 Skipped: 0

ANSWER CHOICES	RESPONSES	
Yes (1)	65.97%	254
No (2)	34.03%	131
TOTAL		385

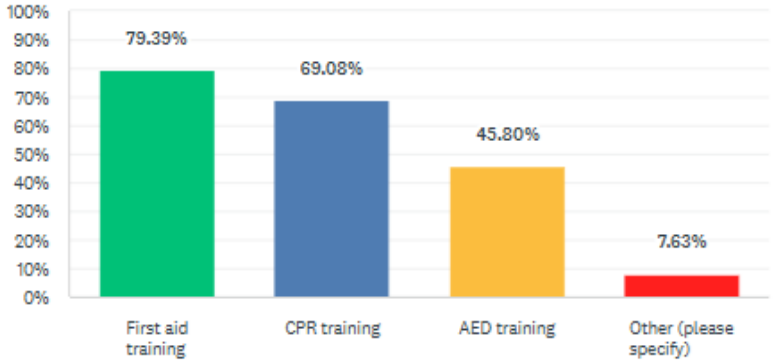
BASIC STATISTICS

Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.34	0.47

Q13

If Yes, please select all that apply

Answered: 262 Skipped: 123



ANSWER CHOICES		RESPONSES	
First aid training (1)		79.39%	208
CPR training (2)		69.08%	181
AED training (3)		45.80%	120
Other (please specify) (4)	Responses	7.63%	20
Total Respondents: 262			

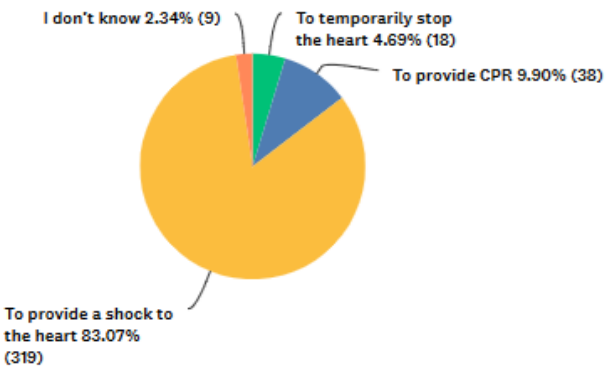
BASIC STATISTICS

Minimum	Maximum	Median	Mean	Standard Deviation
1.00	4.00	2.00	1.91	0.87

Q14

What is the purpose of using a defibrillator (AED)?

Answered: 384 Skipped: 1



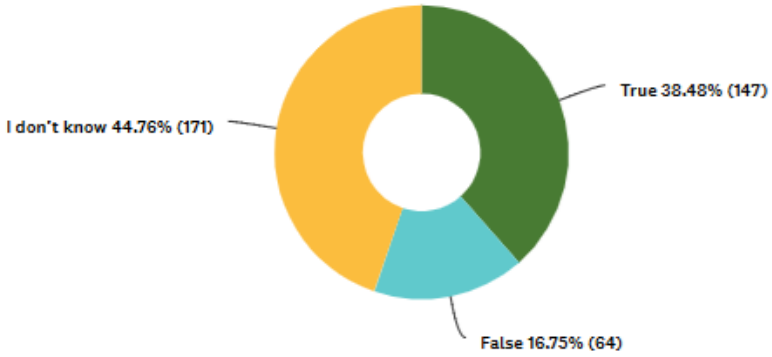
ANSWER CHOICES	RESPONSES	
To temporarily stop the heart (1)	4.69%	18
To provide CPR (2)	9.90%	38
To provide a shock to the heart (3)	83.07%	319
To improve blood flow (4)	0.00%	0
I don't know (5)	2.34%	9
TOTAL		384

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	2.85	0.60

Q15

Defibrillators (AEDs) can be used on children (Children = approx. age 1-8 years old). True or False?

Answered: 382 Skipped: 3



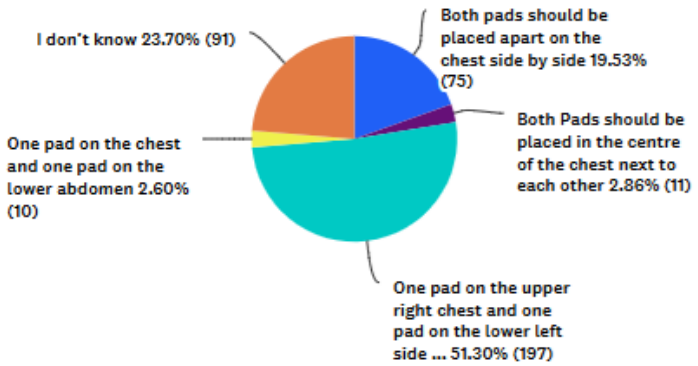
ANSWER CHOICES	RESPONSES	
True (1)	38.48%	147
False (2)	16.75%	64
I don't know (3)	44.76%	171
TOTAL		382

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	2.00	2.06	0.91

Q16

Where should the defibrillator (AED) electrode pads be placed on the body of the person experiencing cardiac arrest?

Answered: 384 Skipped: 1



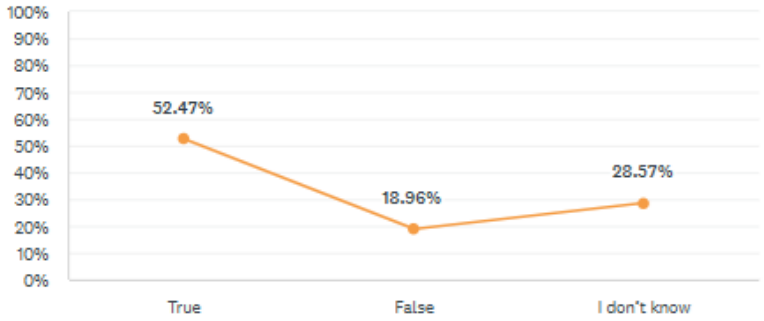
ANSWER CHOICES	RESPONSES	
Both pads should be placed apart on the chest side by side (1)	19.53%	75
Both Pads should be placed in the centre of the chest next to each other (2)	2.86%	11
One pad on the upper right chest and one pad on the lower left side of the chest (3)	51.30%	197
One pad on the chest and one pad on the lower abdomen (4)	2.60%	10
I don't know (5)	23.70%	91
TOTAL		384

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.08	1.33

Q17

Chest hair, clothing or raindrops will impact the effectiveness of the defibrillator (AED). True or False?

Answered: 385 Skipped: 0



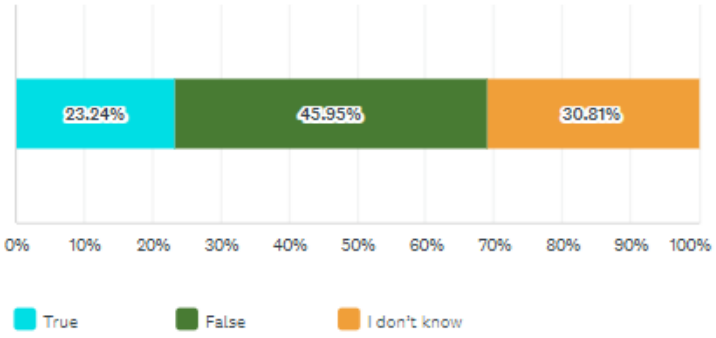
ANSWER CHOICES	RESPONSES	
True (1)	52.47%	202
False (2)	18.96%	73
I don't know (3)	28.57%	110
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	1.00	1.76	0.87

Q18

The person receiving the defibrillator (AED) shock will jump a number of inches off the floor upon receipt. True or False?

Answered: 383 Skipped: 2



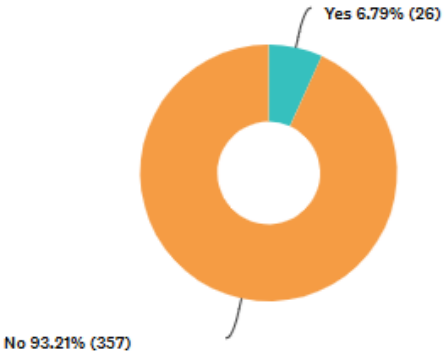
ANSWER CHOICES	RESPONSES	
True (1)	23.24%	89
False (2)	45.95%	176
I don't know (3)	30.81%	118
TOTAL		383

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	2.00	2.08	0.73

Q19

Have you ever used a defibrillator (AED) in a real-life emergency?

Answered: 383 Skipped: 2



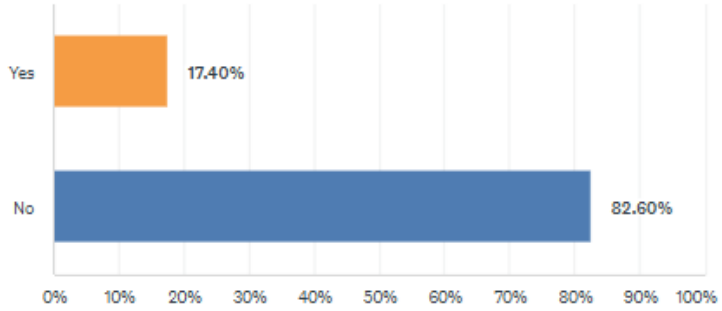
ANSWER CHOICES	RESPONSES	
Yes (1)	6.79%	26
No (2)	93.21%	357
TOTAL		383

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.93	0.25

Q20

Have you ever seen a defibrillator (AED) being used on someone in a real-life emergency?

Answered: 385 Skipped: 0



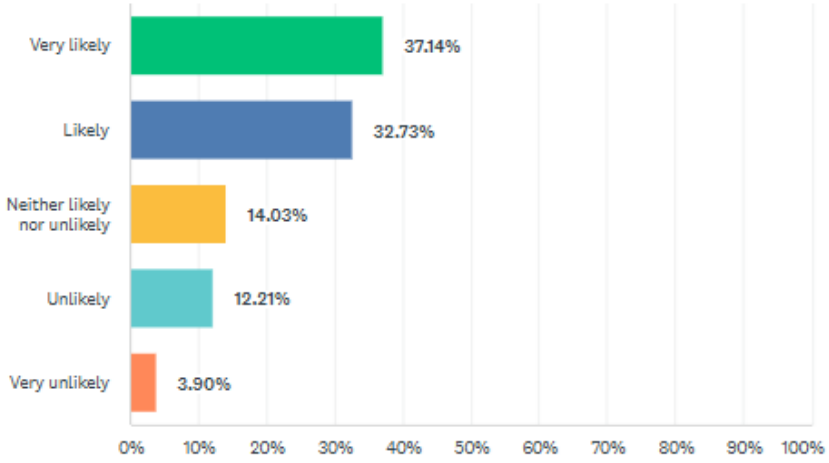
ANSWER CHOICES	RESPONSES	
Yes (1)	17.40%	67
No (2)	82.60%	318
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.83	0.38

Q21

If you witnessed someone in cardiac arrest and you were the only person around, how likely would you be to use a defibrillator on them? (Cardiac Arrest Symptoms = Person collapses, is not breathing or gasping for breath, not responsive, no pulse)

Answered: 385 Skipped: 0



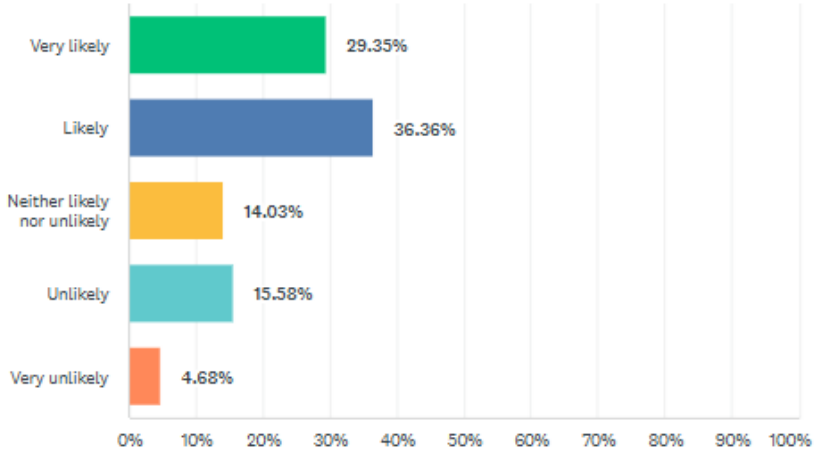
ANSWER CHOICES	RESPONSES	
Very likely (1)	37.14%	143
Likely (2)	32.73%	126
Neither likely nor unlikely (3)	14.03%	54
Unlikely (4)	12.21%	47
Very unlikely (5)	3.90%	15
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.13	1.15

Q22

If you witnessed someone in cardiac arrest and you were around a small group of people (e.g., 3-5 people), how likely would you be to use a defibrillator on the person in cardiac arrest?

Answered: 385 Skipped: 0



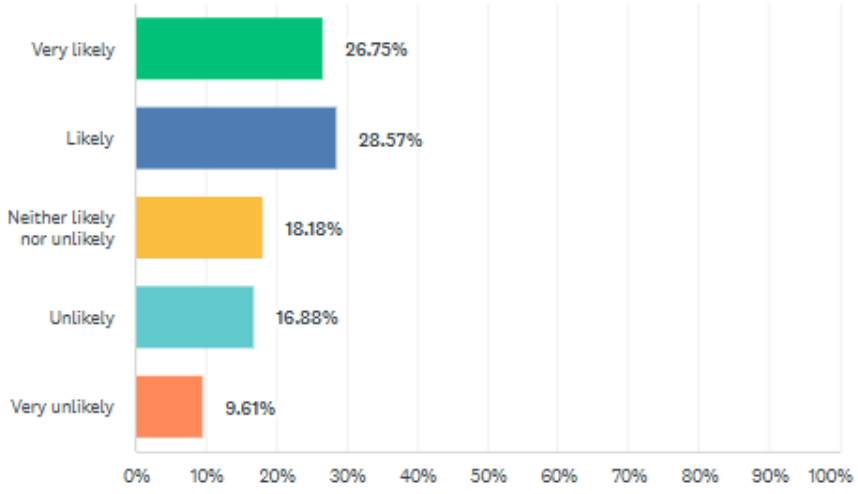
ANSWER CHOICES	RESPONSES	
Very likely (1)	29.35%	113
Likely (2)	36.36%	140
Neither likely nor unlikely (3)	14.03%	54
Unlikely (4)	15.58%	60
Very unlikely (5)	4.68%	18
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.30	1.18

Q23

If you witnessed someone in cardiac arrest and you were around a large group of people (e.g., 10+ people), how likely would you be to use a defibrillator on the person in cardiac arrest?

Answered: 385 Skipped: 0



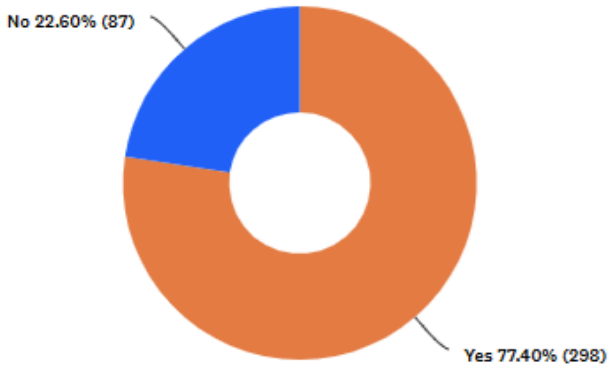
ANSWER CHOICES	RESPONSES	
Very likely (1)	26.75%	103
Likely (2)	28.57%	110
Neither likely nor unlikely (3)	18.18%	70
Unlikely (4)	16.88%	65
Very unlikely (5)	9.61%	37
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	2.00	2.54	1.30

Q24

Would you be interested in attending a free defibrillator (AED) training course? (In person community training for 3 hrs approx.)

Answered: 385 Skipped: 0



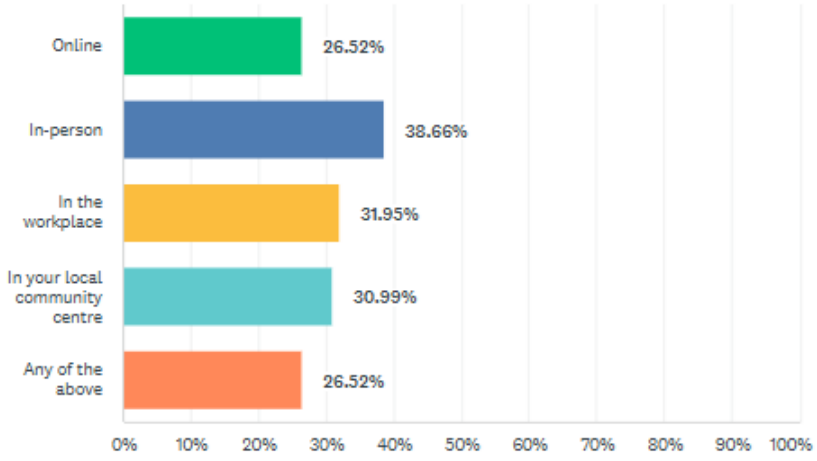
ANSWER CHOICES	RESPONSES	
Yes (1)	77.40%	298
No (2)	22.60%	87
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.23	0.42

Q25

If yes, which form of training would be your preference? (Select all that apply):

Answered: 313 Skipped: 72



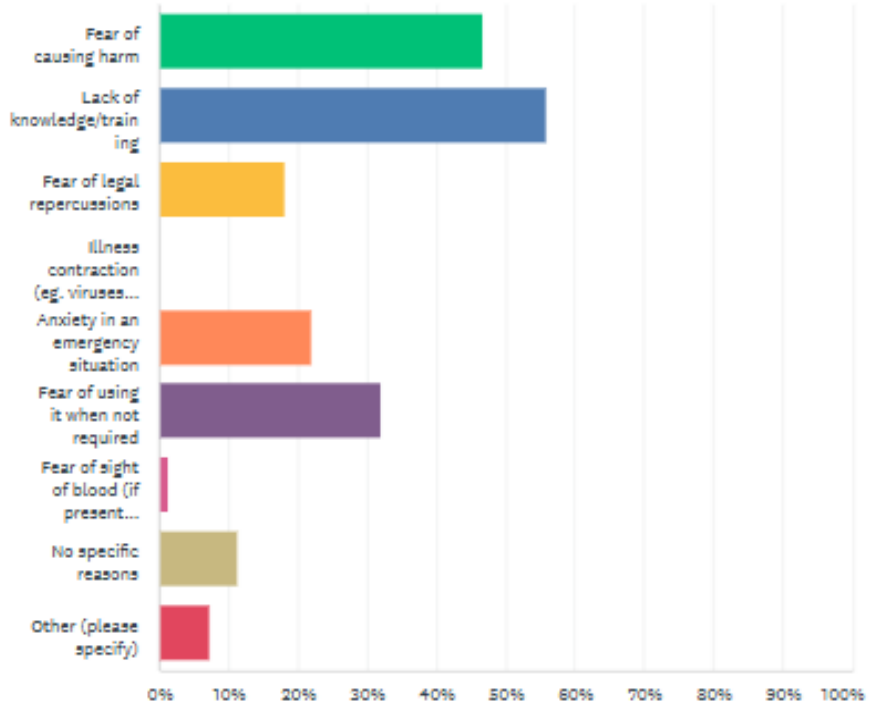
ANSWER CHOICES	RESPONSES	
Online (1)	26.52%	83
In-person (2)	38.66%	121
In the workplace (3)	31.95%	100
In your local community centre (4)	30.99%	97
Any of the above (5)	26.52%	83
Total Respondents: 313		

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	2.95	1.35

Q26

What are the reasons you might not want to use a defibrillator (AED) in an emergency? (Select all that apply)

Answered: 370 Skipped: 15



ANSWER CHOICES		RESPONSES	
Fear of causing harm (1)		46.76%	173
Lack of knowledge/training (2)		55.95%	207
Fear of legal repercussions (3)		18.11%	67
Illness contraction (eg. viruses such as covid-19) (4)		0.27%	1
Anxiety in an emergency situation (5)		21.89%	81
Fear of using it when not required (6)		31.89%	118
Fear of sight of blood (if present resulting from an injury) (7)		1.35%	5
No specific reasons (8)		11.35%	42
Other (please specify) (9)	Responses	7.30%	27
Total Respondents: 370			

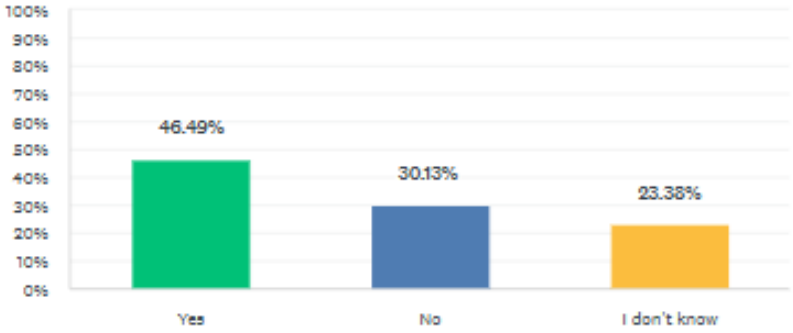
BASIC STATISTICS

Minimum	Maximum	Median	Mean	Standard Deviation
1.00	9.00	2.00	3.49	2.42

Q27

Do you think defibrillators (AEDs) are easily accessible in public places in your local area?

Answered: 385 Skipped: 0



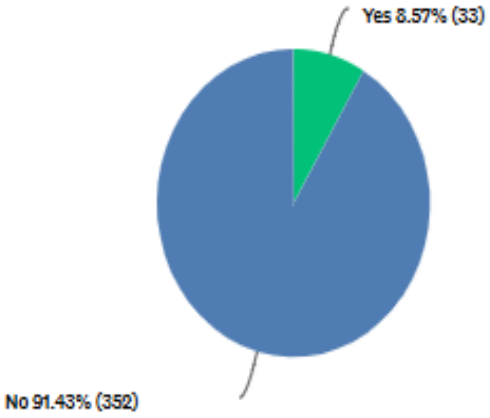
ANSWER CHOICES	RESPONSES	
Yes (1)	46.49%	179
No (2)	30.13%	116
I don't know (3)	23.38%	90
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	3.00	2.00	1.77	0.80

Q28

Have you ever experienced or witnessed someone having difficulty in locating a defibrillator (AED)?

Answered: 385 Skipped: 0



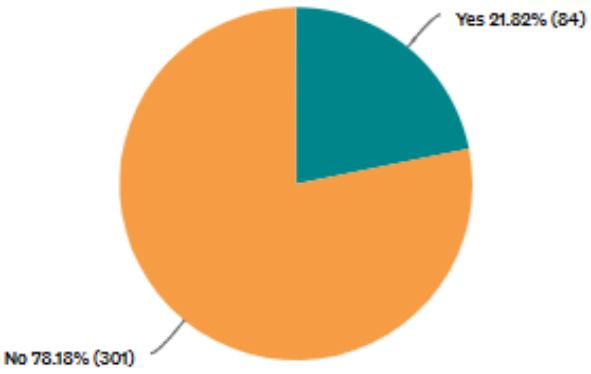
ANSWER CHOICES	RESPONSES	
Yes (1)	8.57%	33
No (2)	91.43%	352
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.91	0.28

Q29

Are you aware of any legal protections that apply when using a defibrillator (AED)? E.g. Good Samaritan Act

Answered: 385 Skipped: 0



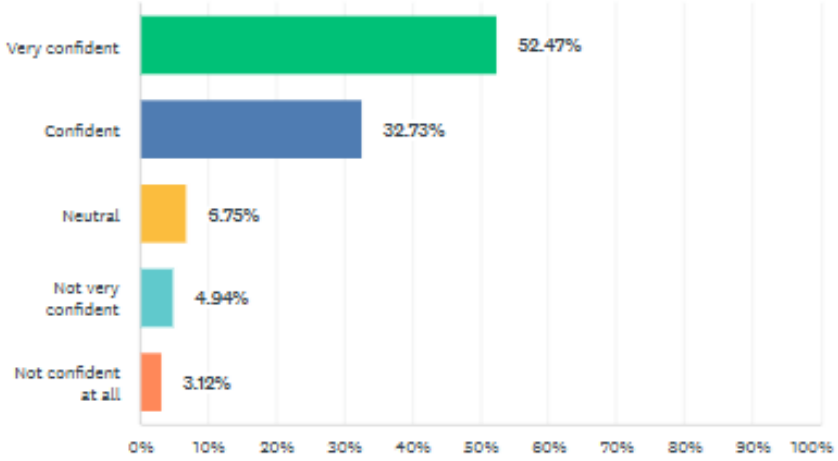
ANSWER CHOICES	RESPONSES	
Yes (1)	21.82%	84
No (2)	78.18%	301
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	2.00	1.78	0.41

Q30

Would you feel confident in recognising a defibrillator (AED) in a public place?

Answered: 385 Skipped: 0



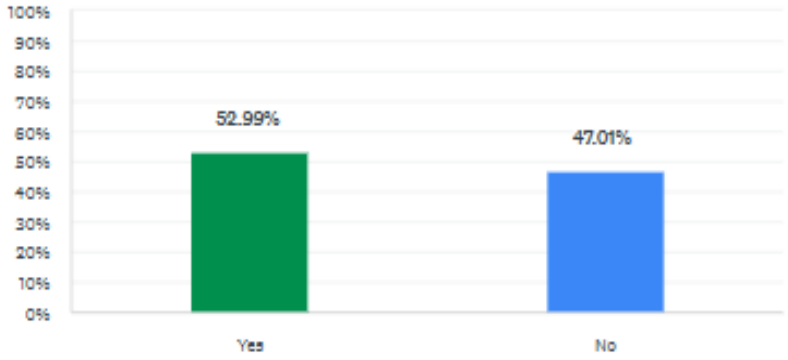
ANSWER CHOICES	RESPONSES	
Very confident (1)	52.47%	202
Confident (2)	32.73%	126
Neutral (3)	6.75%	26
Not very confident (4)	4.94%	19
Not confident at all (5)	3.12%	12
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	1.00	1.74	1.00

Q31

Would you feel confident in recognising the international symbol for a defibrillator (AED)?

Answered: 385 Skipped: 0



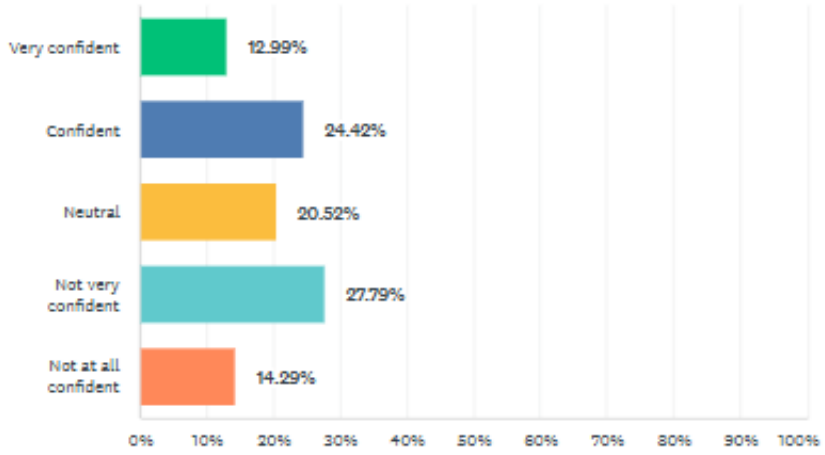
ANSWER CHOICES	RESPONSES	
Yes (1)	52.99%	204
No (2)	47.01%	181
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	2.00	1.00	1.47	0.50

Q32

How confident would you feel in knowing when to use a defibrillator (AED) on someone?

Answered: 385 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very confident (1)	12.99%	50
Confident (2)	24.42%	94
Neutral (3)	20.52%	79
Not very confident (4)	27.79%	107
Not at all confident (5)	14.29%	55
TOTAL		385

BASIC STATISTICS				
Minimum	Maximum	Median	Mean	Standard Deviation
1.00	5.00	3.00	3.06	1.27

Q33 In your opinion, where should defibrillators (AEDs) be placed?

Q34 Would you expect to see defibrillator (AED) locations appearing in google maps & explain your answer?

Appendix 16 – Cross tabulation tables for Demographics interactions

The tables listed below were generated with the assistance of Claude AI.

1. Age × Gender Distribution

Age Group	Male	Female	Total	% Male	% Female
18-24	4 (40.0%)	6 (60.0%)	10	2.4%	2.7%
25-34	25 (39.7%)	38 (60.3%)	63	15.2%	17.3%
35-44	49 (47.6%)	54 (52.4%)	103	29.7%	24.5%
45-54	32 (45.7%)	38 (54.3%)	70	19.4%	17.3%

Age Group	Male	Female	Total	% Male	% Female
55-64	33 (45.8%)	39 (54.2%)	72	20.0%	17.7%
65-74	19 (35.2%)	35 (64.8%)	54	11.5%	15.9%
75+	3 (23.1%)	10 (76.9%)	13	1.8%	4.5%
Total	**165**	**220**	**385**	**100%**	**100%**

2. Education × Age Cross-Tabulation

Age Group	Primary	Secondary	Trade/Tech	Third Level	Postgrad	Doctorate	Total
18-24	0 (0%)	5 (50.0%)	1 (10.0%)	3 (30.0%)	1 (10.0%)	0 (0%)	10
25-34	0 (0%)	6 (9.5%)	3 (4.8%)	25 (39.7%)	26 (41.3%)	3 (4.8%)	63
35-44	0 (0%)	12 (11.7%)	9 (8.7%)	32 (31.1%)	41 (39.8%)	9 (8.7%)	103
45-54	1 (1.4%)	12 (17.1%)	7 (10.0%)	20 (28.6%)	25 (35.7%)	5 (7.1%)	70
55-64	1 (1.4%)	12 (16.7%)	4 (5.6%)	15 (20.8%)	32 (44.4%)	8 (11.1%)	72
65-74	2 (3.7%)	10 (18.5%)	3 (5.6%)	6 (11.1%)	19 (35.2%)	14 (25.9%)	54
75+	0 (0%)	1 (7.7%)	0 (0%)	1 (7.7%)	4 (30.8%)	4 (30.8%)	13

3. Employment × Education Cross-Tabulation

Employment Status	Primary	Secondary	Trade/Tech	Third Level	Postgrad	Doctorate	Total
Healthcare/Medical	0 (0%)	3 (2.9%)	0 (0%)	14 (13.7%)	63 (42.6%)	22 (51.2%)	102
Employed (General)	2 (50.0%)	30 (51.7%)	16 (59.3%)	62 (60.8%)	53 (35.8%)	9 (20.9%)	172
Self-employed	0 (0%)	3 (5.2%)	3 (11.1%)	8 (7.8%)	5 (3.4%)	0 (0%)	19

Employment Status	Primary	Secondary	Trade/Tech	Third Level	Postgrad	Doctorate	Total
Unemployed	0 (0%)	1 (1.7%)	0 (0%)	1 (1.0%)	1 (0.7%)	0 (0%)	3
Student	0 (0%)	3 (5.2%)	0 (0%)	1 (1.0%)	1 (0.7%)	0 (0%)	5
Retired	2 (50.0%)	18 (31.0%)	8 (29.6%)	16 (15.7%)	25 (16.9%)	4 (9.3%)	73

4. Medical Training by Age × Gender

Males with Medical Training

Age Group	Has Training	No Training	Training Rate
18-24	2 (50.0%)	2 (50.0%)	50.0%
25-34	12 (48.0%)	13 (52.0%)	48.0%
35-44	35 (71.4%)	14 (28.6%)	71.4%
45-54	25 (78.1%)	7 (21.9%)	78.1%
55-64	22 (66.7%)	11 (33.3%)	66.7%
65-74	13 (68.4%)	6 (31.6%)	68.4%
75+	1 (33.3%)	2 (66.7%)	33.3%

Females with Medical Training

Age Group	Has Training	No Training	Training Rate
18-24	4 (66.7%)	2 (33.3%)	66.7%
25-34	23 (60.5%)	15 (39.5%)	60.5%
35-44	38 (70.4%)	16 (29.6%)	70.4%

Age Group	Has Training	No Training	Training Rate
45-54	26 (68.4%)	12 (31.6%)	68.4%
55-64	26 (66.7%)	13 (33.3%)	66.7%
65-74	22 (62.9%)	13 (37.1%)	62.9%
75+	5 (50.0%)	5 (50.0%)	50.0%

5. Willingness to Use AED (Alone) by Age × Gender

Males - Willingness When Alone

Age Group	Very Likely	Likely	Neither	Unlikely	Very Unlikely	Total
18-24	2 (50.0%)	1 (25.0%)	1 (25.0%)	0 (0%)	0 (0%)	4
25-34	12 (48.0%)	7 (28.0%)	3 (12.0%)	2 (8.0%)	1 (4.0%)	25
35-44	22 (44.9%)	16 (32.7%)	5 (10.2%)	4 (8.2%)	2 (4.1%)	49
45-54	15 (46.9%)	9 (28.1%)	4 (12.5%)	3 (9.4%)	1 (3.1%)	32
55-64	14 (42.4%)	11 (33.3%)	3 (9.1%)	4 (12.1%)	1 (3.0%)	33
65-74	6 (31.6%)	8 (42.1%)	3 (15.8%)	1 (5.3%)	1 (5.3%)	19
75+	0 (0%)	2 (66.7%)	0 (0%)	1 (33.3%)	0 (0%)	3

Females - Willingness When Alone

Age Group	Very Likely	Likely	Neither	Unlikely	Very Unlikely	Total
18-24	1 (16.7%)	3 (50.0%)	1 (16.7%)	1 (16.7%)	0 (0%)	6

Age Group	Very Likely	Likely	Neither	Unlikely	Very Unlikely	Total
25-34	11 (28.9%)	14 (36.8%)	8 (21.1%)	3 (7.9%)	2 (5.3%)	38
35-44	18 (33.3%)	20 (37.0%)	8 (14.8%)	6 (11.1%)	2 (3.7%)	54
45-54	13 (34.2%)	13 (34.2%)	5 (13.2%)	5 (13.2%)	2 (5.3%)	38
55-64	15 (38.5%)	12 (30.8%)	6 (15.4%)	4 (10.3%)	2 (5.1%)	39
65-74	11 (31.4%)	11 (31.4%)	7 (20.0%)	4 (11.4%)	2 (5.7%)	35
75+	2 (20.0%)	4 (40.0%)	2 (20.0%)	1 (10.0%)	1 (10.0%)	10

6. AED Knowledge by Education × Employment

Knowledge of AED Purpose (Correct = "Shock to Heart")

Employment	Primary	Secondary	Trade/Tech	Third Level	Postgrad	Doctorate
Healthcare	-	3/3 (100%)	-	13/14 (92.9%)	54/63 (85.7%)	21/22 (95.5%)
General Employed	2/2 (100%)	22/30 (73.3%)	13/16 (81.3%)	51/62 (82.3%)	46/53 (86.8%)	8/9 (88.9%)
Retired	1/2 (50.0%)	14/18 (77.8%)	7/8 (87.5%)	14/16 (87.5%)	20/25 (80.0%)	3/4 (75.0%)

7. Training Interest by Age × Education

Interest in Free AED Training (% Yes)

Age Group	Primary	Secondary	Trade/Tech	Third Level	Postgrad	Doctorate
18-24	-	4/5 (80.0%)	1/1 (100%)	3/3 (100%)	1/1 (100%)	-

Age Group	Primary	Secondary	Trade/Tech	Third Level	Postgrad	Doctorate
25-34	-	5/6 (83.3%)	3/3 (100%)	20/25 (80.0%)	21/26 (80.8%)	3/3 (100%)
35-44	-	10/12 (83.3%)	8/9 (88.9%)	26/32 (81.3%)	33/41 (80.5%)	7/9 (77.8%)
45-54	1/1 (100%)	10/12 (83.3%)	5/7 (71.4%)	15/20 (75.0%)	19/25 (76.0%)	4/5 (80.0%)
55-64	1/1 (100%)	8/12 (66.7%)	2/4 (50.0%)	11/15 (73.3%)	23/32 (71.9%)	6/8 (75.0%)
65-74	1/2 (50.0%)	6/10 (60.0%)	2/3 (66.7%)	4/6 (66.7%)	13/19 (68.4%)	9/14 (64.3%)
75+	-	1/1 (100%)	-	1/1 (100%)	2/4 (50.0%)	2/4 (50.0%)

8. Barriers to AED Use by Gender × Age

Top 3 Barriers by Gender

Barrier	Males (n=165)	Females (n=220)	Difference
Lack of knowledge/training	87 (52.7%)	120 (54.5%)	+1.8% F
Fear of causing harm	68 (41.2%)	105 (47.7%)	+6.5% F
Fear of using when not required	48 (29.1%)	70 (31.8%)	+2.7% F
Anxiety in emergency	28 (17.0%)	53 (24.1%)	+7.1% F
Legal repercussions	32 (19.4%)	35 (15.9%)	-3.5% M

Age Groups with Highest Barrier Rates

Age Group	Fear of Harm	Lack of Knowledge	Anxiety
18-24	6/10 (60.0%)	7/10 (70.0%)	4/10 (40.0%)
25-34	28/63 (44.4%)	38/63 (60.3%)	16/63 (25.4%)
35-44	45/103 (43.7%)	55/103 (53.4%)	21/103 (20.4%)
45-54	32/70 (45.7%)	37/70 (52.9%)	14/70 (20.0%)
55-64	35/72 (48.6%)	39/72 (54.2%)	15/72 (20.8%)
65-74	22/54 (40.7%)	26/54 (48.1%)	9/54 (16.7%)
75+	5/13 (38.5%)	5/13 (38.5%)	2/13 (15.4%)

9. Confidence Levels by Training Status × Age

Confidence in Knowing When to Use AED

Age Group	With Training (Confident/Very Confident)	Without Training (Confident/Very Confident)
18-24	4/6 (66.7%)	1/4 (25.0%)
25-34	19/35 (54.3%)	7/28 (25.0%)
35-44	42/73 (57.5%)	8/30 (26.7%)
45-54	32/51 (62.7%)	5/19 (26.3%)
55-64	26/48 (54.2%)	6/24 (25.0%)
65-74	18/35 (51.4%)	4/19 (21.1%)
75+	3/6 (50.0%)	1/7 (14.3%)

10. Location Awareness by Employment × Education

Knowledge of AED Locations in Community

Employment	Knows Locations	Doesn't Know	Awareness Rate
Healthcare	86/102 (84.3%)	16/102 (15.7%)	84.3%

Employment	Knows Locations	Doesn't Know	Awareness Rate
General Employed	130/172 (75.6%)	42/172 (24.4%)	75.6%
Self-employed	13/19 (68.4%)	6/19 (31.6%)	68.4%
Retired	52/73 (71.2%)	21/73 (28.8%)	71.2%
Student	3/5 (60.0%)	2/5 (40.0%)	60.0%

Appendix 17 – Statistical tables for key relationships

The tables listed below were generated with the assistance of Claude AI.

1. Demographics Overview

Demographic	Category	Count	Percentage
Age	18-24	10	2.6%
	25-34	63	16.4%
	35-44	103	26.8%
	45-54	70	18.2%
	55-64	72	18.7%
	65-74	54	14.0%
	75+	13	3.4%
Gender	Male	165	42.9%
	Female	220	57.1%
Education	Primary School	4	1.0%
	Secondary School	58	15.1%
	Trade/Technical	27	7.0%
	Third Level	102	26.5%
	Postgraduate	148	38.4%

Demographic	Category	Count	Percentage
	Doctorate	43	11.2%

2. AED Knowledge & Training by Demographics

Knowledge of AED Purpose by Education Level

Education Level	Correct Answer (Shock to Heart)	Incorrect/Don't Know	Total
Primary School	3 (75.0%)	1 (25.0%)	4
Secondary School	44 (75.9%)	14 (24.1%)	58
Trade/Technical	23 (85.2%)	4 (14.8%)	27
Third Level	87 (85.3%)	15 (14.7%)	102
Postgraduate	126 (85.1%)	22 (14.9%)	148
Doctorate	36 (83.7%)	7 (16.3%)	43

Previous Medical Training by Age Group

Age Group	Has Training	No Training	Training Rate
18-24	6 (60.0%)	4 (40.0%)	60.0%
25-34	35 (55.6%)	28 (44.4%)	55.6%
35-44	73 (70.9%)	30 (29.1%)	70.9%
45-54	51 (72.9%)	19 (27.1%)	72.9%
55-64	48 (66.7%)	24 (33.3%)	66.7%
65-74	35 (64.8%)	19 (35.2%)	64.8%
75+	6 (46.2%)	7 (53.8%)	46.2%

3. Willingness to Use AED by Scenario

Scenario	Very Likely	Likely	Neither	Unlikely	Very Unlikely
Alone with victim	143 (37.1%)	126 (32.7%)	54 (14.0%)	47 (12.2%)	15 (3.9%)
Small group (3-5 people)	113 (29.4%)	140 (36.4%)	54 (14.0%)	60 (15.6%)	18 (4.7%)
Large group (10+ people)	103 (26.8%)	110 (28.6%)	70 (18.2%)	65 (16.9%)	37 (9.6%)

4. Barriers to AED Use

Barrier	Count	Percentage
Lack of knowledge/training	207	55.9%
Fear of causing harm	173	46.8%
Fear of using when not required	118	31.9%
Anxiety in emergency situation	81	21.9%
Fear of legal repercussions	67	18.1%
No specific reasons	42	11.4%
Fear of sight of blood	5	1.4%
Illness contraction concerns	1	0.3%

5. Training Interest and Preferences

Interest in Free AED Training

Response	Count	Percentage
Yes	298	77.4%
No	87	22.6%

Preferred Training Format (Multiple selections allowed)

Training Type	Count	Percentage of Interested
In-person	121	38.7%
In your local community centre	100	32.0%
In the workplace	97	31.0%
Any of the above	83	26.5%
Online	83	26.5%

6. AED Accessibility & Location Awareness

Knowledge of AED Locations in Community

Response	Count	Percentage
Yes	293	76.1%
No	82	21.3%
Yes (specified location)	12	3.1%

Most Common AED Locations (Among those who know locations)

Location Type	Count	Percentage
Sports club	152	49.7%
Local shop	100	32.7%
Employment	71	23.2%
Other specified	71	23.2%
Community centre	58	19.0%
Hospital	53	17.3%

7. Confidence Levels

Confidence in Recognising AED

Confidence Level	Count	Percentage
Very confident	202	52.5%
Confident	126	32.7%
Neutral	26	6.8%
Not very confident	19	4.9%
Not confident at all	12	3.1%

Confidence in Knowing When to Use AED

Confidence Level	Count	Percentage
Very confident	50	13.0%
Confident	94	24.4%
Neutral	79	20.5%
Not very confident	107	27.8%
Not at all confident	55	14.3%

8. Key Cross-Tabulation: Training vs. Willingness to Use (Alone Scenario)

Training Status	Very Likely	Likely	Neither	Unlikely	Very Unlikely	Total
Has Training	113 (44.5%)	85 (33.5%)	29 (11.4%)	20 (7.9%)	7 (2.8%)	254
No Training	30 (22.9%)	41 (31.3%)	25 (19.1%)	27 (20.6%)	8 (6.1%)	131

9. Geographic Distribution (Top Locations)

County	Count	Percentage
Dublin	291	75.6%
Cork	14	3.6%
Kildare	15	3.9%
Wicklow	13	3.4%
Meath	14	3.6%
Galway	7	1.8%
Other counties	31	8.1%

10. Legal Awareness

Awareness of Legal Protections	Count	Percentage
Yes	84	21.8%
No	301	78.2%

Appendix 18 – Objective summary tables

The tables listed below were generated with the assistance of Claude AI.

Objective 1: Demographics - AED Knowledge Associations

Demographic Factor	Key Findings	Statistical Details
Age	Curvilinear relationship with optimal knowledge at 35-44 years	84.6% of high-knowledge respondents aged 35-44
	Knowledge deficits in older cohorts	54 respondents (65-74) + 15 respondents (55-64) believed AED causes victim to jump

Demographic Factor	Key Findings	Statistical Details
Education	Strong correlation with AED knowledge	84.6% of high-knowledge respondents had third-level qualifications
		92.3% of these received formal training
Geography	Urban advantage in knowledge levels	69.2% of high-knowledge respondents were Dublin-based
	Rural knowledge gaps despite training	94 respondents (24.4%) from outside Dublin with varying knowledge despite 68 having training
Training	Strongest predictor of knowledge	92.3% of high-knowledge respondents had formal training
		66.7% had specific AED training
		Only 1 respondent achieved high scores without training
Employment	Healthcare/medical fields show moderate association	30.8% (n=4) of high-knowledge respondents in healthcare/science/medical fields
Gender	No substantial knowledge prediction	Specific gap: 95.9% males vs 57.0% females lacked paediatric pad placement knowledge

Objective 2: Perceived Barriers to AED Use vs. Understanding Patterns

Barrier Category	Findings	Percentage
Knowledge Gap Paradox	High awareness but persistent barriers	83.07% aware of AED purpose, 85.20% confident in recognition
Primary Barriers	Lack of knowledge/training	55.95%
	Fear of causing harm	46.76%

Barrier Category	Findings	Percentage
	Fear of inappropriate use	31.89%
	Emergency anxiety	21.89%
	Legal concerns	18.11%
Social Context Impact	Willingness decreases with more bystanders	Alone: 69.87%, Small group: 65.71%, Large group: 55.32%
Diffusion of Responsibility	Inverse relationship between bystanders and willingness to act	Clear pattern of decreased intervention with increased group size

Objective 3: Awareness Demographics Relationships

Demographic	Awareness Pattern	Key Statistics
Educational Attainment	Higher education = deeper technical understanding	99.48% basic awareness across all levels
		Postgraduate: 11.17% with complex understanding
		Primary education: 1.04% with basic awareness only
Professional Background	Healthcare employment = superior awareness quality	Healthcare respondents: 83.07% correct AED functionality
		Non-healthcare: Lower confidence in practical application
		Retired: 18.96% correct identification
Age-Related Patterns	Middle-aged adults show highest knowledge	35-44 years: 26.75%, 45-54 years: 18.18%

Demographic	Awareness Pattern	Key Statistics
	Younger adults: good awareness, low confidence	18-24 years: 2.60%, 25-34 years: 16.36%
	Older adults: adequate awareness, low technical confidence	65-74 years: 14.03%, 75+ years: 3.38%
Information Sources	Younger: social media and education	Age-appropriate information channels
	Older: TV and radio	Traditional media preference

Objective 4: Impact of Education/Training on AED Utilisation Perceptions

Factor	Impact on Perceptions	Statistical Evidence
Training vs Education	Training superior to general education	Training recipients: 65.97% (n=254, 95% CI: 60.9-70.8%)
		Training correlation with recognition: $r^2 = 1.0$, CoV = 1.0
Barrier Reduction (Training)	Fear of harm reduction	38.5% reduction (38.2% vs 62.1%)
	Knowledge barriers	46.8% reduction (41.7% vs 78.5%)
	Legal concerns	57.1% reduction (12.6% vs 29.4%)
Barrier Reduction (Education)	More modest reductions	Fear of harm: 16.3% reduction
		Knowledge barriers: 16.9% reduction
		Legal concerns: 22.1% reduction
Regression Analysis	Training stronger predictor	Training: $\beta = 0.847$ ($p < 0.001$)
		Education: $\beta = 0.142$ ($p = 0.023$)

Factor	Impact on Perceptions	Statistical Evidence
Age Consistency	Training effective across all ages	18-34: 186% confidence improvement
		35-54: 162% improvement
		55+: 141% improvement
Intervention Likelihood	Training vs education impact	Trained respondents: 89.3% likelihood to intervene
		Higher education only: 56.7% likelihood
		Training improvement: 157% vs Education: 23%
Learning Preferences	Higher education: technology acceptance	Google maps: $r^2 = 0.23$, Online training: $r^2 = 0.31$
	Lower education: hands-on preference	Practical training: 91.2%, Community courses: 78.4%

Appendix 19 – Theme summary tables

The tables listed below were generated with the assistance of Claude AI.

Theme 1: The Knowledge-Action Gap

Aspect	Key Findings	Statistics	Implications
Core Issue	Disconnect between theoretical knowledge and practical application confidence	High willingness to help (143/385 very likely when alone) but substantial knowledge deficits	Training programmes needed to bridge gap between awareness and competence
Knowledge vs Confidence	99.48% awareness but only moderate confidence	Among 90 high-intervention respondents: 84.4% identified AED	Superficial awareness doesn't translate to

Aspect	Key Findings	Statistics	Implications
	(M=3.06, 95% CI: 2.93-3.19)	purpose correctly, only 61.1% understood paediatric use	comprehensive understanding
Training Impact	Most significant predictor for closing gap	$F(2,382) = 45.6$, $p < 0.001$; $\eta^2 = 0.193$ (19.3% variance explained)	Training accounts for nearly 20% of confidence variation
Gender Differences	Irish females show higher fear but comparable confidence	$\chi^2 = 13.2$, $p = 0.004$ for AED recognition; 85.7% females feared harm vs 35.8% males	Cultural and contextual factors influence gender responses
Educational Effects	Higher education correlates with better AED knowledge	$F(5,379) = 12.3$, $p < 0.001$; Postgraduate M=4.2 vs Secondary M=3.1	Targeted programmes needed across educational backgrounds
Intervention Predictors	Training increases intervention likelihood 3x	OR = 3.24 (95% CI: 2.18-4.82); Age 35-54 OR = 1.85 (95% CI: 1.23-2.78)	Focus training on middle-aged adults for maximum impact

Theme 2: Social Context and Intervention Dynamics (Bystander Effect)

Aspect	Key Findings	Statistics	Implications
Core Pattern	Clear inverse relationship between group size and intervention willingness	Alone: 37.1% very likely; Small groups (3-5): 29.4%; Large groups (10+): 9.6%	74% reduction in high-confidence intervention from alone to large group
Scale Reliability	Strong measurement consistency	Cronbach's $\alpha = 0.91$ for bystander scale	Robust measurement of bystander effect phenomenon
Survival Impact	Social barriers directly impact outcomes	7-10% survival rate reduction per minute of delay	Psychological barriers have life-or-death consequences

Aspect	Key Findings	Statistics	Implications
Gender Variations	Different susceptibility patterns by gender	Males: 18.2% confidence decrease in groups; Females: 11.4% decrease	Males more affected by group dynamics in emergency settings
Reluctance Increase	Growing unwillingness with group size	Alone: 16.1% reluctant; Large groups: 26.5% reluctant	65% increase in reluctance represents significant barrier
International Consistency	Cross-cultural phenomenon	Aligns with Kono et al. (2024) Japanese findings	Universal psychological barrier requiring targeted interventions

Theme 3: Psychological Barriers to Emergency Response

Aspect	Key Findings	Statistics	Implications
Primary Fear	Fear of causing harm most prevalent concern	173/385 (44.9%) affected across all demographics	Universal barrier requiring confidence-building interventions
Knowledge Anxiety	Concerns about inadequate training/knowledge	53.8% (n=207) expressed knowledge-related anxieties	Strong association with training status ($\chi^2 = 45.2$, $p < 0.001$)
Legal Fears	Significant concern despite legal protections	17.4% (n=67) affected; 78.2% unaware of Good Samaritan Laws	Public education needed about legal protections
Multiple Barriers	Co-occurring fears common	32% reported multiple concurrent barriers; Cramer's $V = 0.34$, $p < 0.001$	Complex psychology requires comprehensive intervention approach

Aspect	Key Findings	Statistics	Implications
Training Relationship	Trained respondents show reduced knowledge concerns	Significant association between barrier presence and training status	Quality and retention of training programmes critical
International Alignment	Consistent patterns across cultures	Chen et al. (2024): 29.3% fear harm; AlRadini et al. (2023): 14.3% fear hurting victim	Universal psychological patterns suggest generalisable interventions

Theme 4: Demographic Disparities in Emergency Preparedness

Aspect	Key Findings	Statistics	Implications
Gender as Primary Factor	Most significant differentiating demographic variable	Female fear of harm: 114/133 (85.7%) vs Male: 59/165 (35.8%); $\chi^2 = 67.4$, $p < 0.001$	Gendered approaches to emergency intervention training needed
Female Knowledge Barriers	Higher self-reported training needs among females	118/133 (88.7%) females cited lack of knowledge vs 55/165 (33.3%) males	Contrasts with some international findings, suggests cultural variations
Educational Paradox	High education doesn't eliminate barriers	293/385 third-level qualified; 48.1% still feared harm, 53.6% lacked confidence	Higher education ≠ emergency response confidence
Age-Related Patterns	Older adults show substantial barriers	Age 55+: 43.2% fear harm, 52.5% lack knowledge/training	Concerning pattern for demographic likely to witness peer emergencies
Geographic Consistency	Similar patterns across locations	Dublin vs non-Dublin similar barrier rates	Geographic location not main determinant of reluctance

Aspect	Key Findings	Statistics	Implications
		(46.4% vs 47.9% fear harm)	
Dual Female Vulnerability	Women less likely to receive and provide AED interventions	Aligns with Blewer et al. (2024) findings on reduced female AED receipt	Comprehensive gender-sensitive training approaches needed

Theme 5: Confidence-Knowledge-Action Gap

Aspect	Key Findings	Statistics	Implications
Core Paradox	High awareness, low practical confidence	99.48% (383/385) AED awareness; 83.07% (319/385) know function; Only 37.41% (144/385) confident in usage	Traditional awareness approaches insufficient
Age-Related Confidence Gap	Particularly pronounced in older demographics	Age 55+: 89.2% awareness but only 23.1% practical confidence	Generational differences in technology/medical intervention comfort
Training Paradox	Even trained individuals show limited confidence	65.97% had medical training; Only 12.99% "very confident" in AED use	Training quality/recency more important than quantity
Recognition vs Usage Gap	Higher confidence in identification than application	Recognition confidence M=3.31±1.02 vs Usage confidence M=2.54±1.18 ($p<0.001$)	Device familiarity doesn't equal usage readiness
Social Context Impact	Declining confidence with increased bystanders	Single responder: 37.14% very likely; Small group: 29.35%; Large group: 26.75%	Social diffusion compounds individual confidence deficits

Aspect	Key Findings	Statistics	Implications
Barrier Complexity	Multiple psychological factors compound confidence issues	46.76% fear harm; 55.95% cite knowledge gaps; Only 21.82% aware of legal protections	Multifaceted approach needed addressing technical and psychological elements

Theme 6: Technology Integration and Modern Expectations

Aspect	Key Findings	Statistics	Implications
Digital Integration Demand	Strong expectation for technological solutions	78.5% positive responses to Google Maps integration question	Technology viewed as essential for modern emergency response
Generational Digital Divide	Significant age-related differences in technology acceptance	Age 18-34: 87.3% support app-based services vs Age 65+: 56.8% support; $\chi^2 = 12.43$, $p < 0.01$	Multi-modal approaches needed considering digital literacy variations
Practical Technology Understanding	Sophisticated awareness of technological limitations	Concerns about signal availability and emergency decision-making under pressure	Public perceptions more nuanced than research literature suggests
Emergency Context Realism	Recognition that technology has situational constraints	"Under pressure circumstances it's not something I'd think to google map"	Integration strategies must account for crisis decision-making patterns
Multi-Modal Necessity	Need for diverse information delivery methods	Variance in comfort levels across demographics	Technology solutions should supplement, not replace, traditional approaches
Alignment with Literature	Supports smartphone-based	Consistent with Kern et al. (2025) findings on	Evidence base supports technological

Aspect	Key Findings	Statistics	Implications
	emergency response research	volunteer first responder systems	integration with appropriate caveats

Appendix 20 – Summary of Cross-Theme Implications

Integration Point	Finding	Recommendation
Training as Universal Solution	Appears across all themes as primary intervention	Develop comprehensive, scenario-based training addressing technical, psychological, and social barriers
Gender-Specific Approaches	Consistent gender differences in barriers and responses	Create targeted interventions acknowledging gendered emergency response patterns
Technology Integration Strategy	High demand but variable comfort/utility across demographics	Implement multi-modal technological solutions with non-digital backups
Social Psychology Focus	Bystander effects and psychological barriers dominant across themes	Incorporate social psychology principles into training and public education campaigns
Demographic Tailoring	Age, education, and gender create distinct intervention needs	Develop segmented approaches rather than one-size-fits-all programmes

(generated using Claude AI, 2025)