

**‘Traditional Emergency Department or Emergency Nurse
Led Minor Injury Unit: Predicting Patient Choice for Delivery
of Minor Injury Care’**

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Doctor of Advanced Healthcare Practice (DAHP)**

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Abstract

Background

The unsustainable demand upon Emergency Departments and the challenges of recruiting and retaining emergency care doctors has frequently resulted in policy and local service commissioners changing the way emergency care is delivered. Such reconfiguration has frequently involved centralisation of Emergency Departments and diversification of services delivering minor injury care to Emergency Nurse Practitioner led Minor Injury Units.

Despite the reconfiguration of emergency care, including minor injury services, existing research has yet failed to explore patient choice of a minor injury service (Emergency Department or Emergency Nurse led Minor Injury Unit) and how patient characteristics may influence such choice. In addition, there is also a deficiency of research exploring the rationale behind such choices. This paucity of investigation into how patients may react to a change in minor injury services is addressed by this study.

Aim

To explore the preference of individuals attending a traditional Emergency Department versus an Emergency Nurse Practitioner led Minor Injury Unit and identify demographic and socio-economic factors that predict preference.

Method

The study implemented an observational design, specifically that of a cross-sectional survey. Between May 2016 and March 2017, the study recruited n=500 patients attending an Emergency Department with a minor injury or illness, the participants were surveyed by means of a self-designed questionnaire.

Data analysis involved scrutiny of descriptive statistics and the implementation of correlation analysis between the dependent variable 'choice of minor injury service' and a suite of appropriate independent demographic and socio-economic variables. The statistically significant ($p < .05$) independent variables were taken forward into logistic regression analysis to investigate their ability to predict 'choice of minor injury service'. Correlation analysis was also run on the same variables to explore the relationship between 'reasons for choice of minor injury service'.

Results

The results of the logistic regression analysis using the variables of age and level of deprivation found every year of age, the odds of choosing an Emergency Nurse Practitioner led Minor Injury Unit increased by 1.2% (95% CI 1.011-1.024). The results also demonstrated that for every level of deprivation (Welsh Index Multiple Deprivation) the odds of choosing an Emergency Nurse led minor injury unit increased by 10% (95% CI 1.100 – 1.023). That is the patients from areas of lower deprivation were more likely to choose an Emergency Department for the treatment of their minor injury.

Finally, a statistically significant correlation was found between age and reasons for choosing an Emergency Nurse Practitioner led Minor Injury Unit. That is, patients in the younger age group (18-32 years) would choose an Emergency Nurse Practitioner led Minor Injury Unit due to shorter waiting times, whilst patients over 50 years of age chose an Emergency Nurse Practitioner Led minor Injury Unit as they had greater trust in the clinical capabilities of an Emergency Nurse Practitioner.

Discussion

The findings of this study highlight the importance of acknowledging local context when implementing health service reconfiguration. The study promotes the need for service commissioners to understand how patient characteristics may affect choice of minor injury service.

The findings of the study suggest that any future local patient engagement and communication strategy regarding reconfiguration of local minor injury services needs to target and connect with the younger age groups and those from areas of lower deprivation. The findings also suggest that such strategies may need to target the younger patients with more purposeful messages such as the 'hook' of shorter waiting times in Emergency Nurse Practitioner led Minor Injury Units and how the Emergency Nurse Practitioners provide care equitable to a doctor.

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Glossary

ABUHB Aneurin Bevan University Health Board

CB Contingent Behaviour

ENP Emergency Nurse Practitioner

ED Emergency Department

MIU Minor Injury Unit

RGH Royal Gwent Hospital

TCM Travel Cost Method

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Chapter 1 Introduction

1.1 Introduction

This chapter will open by establishing the background and context to the study. The chapter will then proceed by determining the rationale for undertaking the research and conclude by outlining the thesis structure.

1.2 Background

Healthcare systems around the globe face the challenge of responding to rising demand, alongside periods of austerity and dwindling economic resources (Black 2013). Attempts to seek a solution to this impasse frequently involve proposals to reconfigure and redesign the delivery of healthcare (Barratt et al 2015).

Such reconfiguration of healthcare is frequently found in the delivery of emergency care (Kings Fund 2014) and no more so than in Welsh emergency care (Knapman 2019, Caerphilly Observer 2016, Gurner 2013a 2013b). NHS Wales is facing unprecedented pressures to provide safe, effective and efficient emergency care in a service experiencing increasing levels of demand (NHS Wales 2013). Between April 2018 and April 2019, Welsh Emergency Departments (ED) saw 1,026,848 attendances (Welsh Government 2020a). The total number of ED attendances in the year to April 2019 was up 2.5 % compared with the year to April 2018; the numbers had also increased by 7.9 % since the same 12-month period, 5 years before (year ending April 2014) (Welsh Government 2019b).

Reasons for the growing demand upon the emergency care system are multi-factorial and involves a 'perfect storm' of challenges for the Welsh NHS. One of the dominant factors employed to explain the continued rise in demand is the increasing Welsh population and age profile. The population of Wales is projected to increase by 3.1 % to 3.21 million by 2026 and by 4.6 % to 3.26 million by 2041 (Welsh Government 2019a). Over the next 20 years the number of people aged 85 years and over in the UK is due to surge by two thirds, compared with a 10% overall growth in the population (Quality Care for Older People with Urgent and Emergency Care Needs 2012). Such numbers are reflected in recent Welsh statistics regarding ED attendances, which indicate the 75-84 years age group saw the largest percentage increase in attendances at ED (5.7 %) compared with 2016-17 (Welsh Government 2020).

As a result of increasing numbers of older people, the Welsh NHS Confederation (2017) has highlighted an upturn in people suffering from chronic conditions, which equates to an increased demand on healthcare. The Welsh NHS Confederation (2017) state the number of people aged 65 and over in Wales is anticipated to rise by 50% by 2037, producing a 56% growth of people living with chronic conditions. This statistic is reflected by the 2011 census, which indicates Wales has a high percentage of residents living with a long-term health problem, 23% higher than in comparison with England (Office National Statistics 2011). Such statistics have the potential to increase demand on Welsh EDs particularly as the literature suggests patients are more likely to attend ED when experiencing an exacerbation of chronic conditions (Su Lee et al 2018, Langer et al 2013, Hunter et al 2013, Patel et al 2007). The combination of increasing numbers of people experiencing chronic health problems and patients choosing ED for the management of chronic illness exacerbation, typically results in increasing ED attendances. Such extra demand on ED services ultimately threatens the sustainability of emergency care services and potentially compromises patient safety.

An additional factor compounding the demand upon Welsh emergency care services is the recruitment difficulties associated with the related doctor workforce. The intense working environment associated with the ED has been found to create premature career 'burnout' and a significant level of medical staff dissatisfaction, resulting in high levels of attrition (Royal College of Emergency Medicine 2018). The Royal College of Emergency Medicine (RCEM) (2018) claims there has been a historical mismatch in supply and demand, which has led to difficulty recruiting and retaining emergency care doctors, creating a dilution of skills and knowledge. RCEM (2018) describe how this situation is self-perpetuating and threatens the attractiveness of the speciality for the next generation of doctors, whose recruitment is paramount in achieving safe staffing levels in EDs. This is magnified in Wales where one ED consultant exists per 15000 ED attendances; this value is the highest in the UK (England: one ED consultant/ 8879 attendances, Scotland: one ED consultant/7300, Northern Ireland: one consultant/11700 attendances) (RCEM 2018). The issues associated with the emergency care workforce demonstrates a need to organise emergency care services differently; this may involve diversification of services away from ED, delivered by a non-medical workforce.

It can be argued that increasing demand and difficulties with workforce availability have impacted upon the ability to adhere to governmental performance targets and recommendations (NHS England 2019). A raft of ED performance indicators exists, including

waiting times, average time to treatment, average time spent in ED, percentage of patients spending less than four hours in ED and ambulance turnaround times (Baker 2017). Recent performance data denotes that up to December 2019, 6656 patients in Wales spent 12 hours or more in ED, an increase of 70.8 % since the previous December. Similar results were found with the four-hour target (patients to be transferred or discharged from ED within four hours). Statistics regarding compliance with the four-hour target indicate that December 2019 saw a compliance rate of 72.1%, indicating a drop of 5.7% since December 2018 (Baker 2020). This is also echoed in the performance data for English emergency care, which indicates the proportion of patients spending over four hours in ED in 2019 was the worst annual performance on record (Baker 2020). The data articulates that 15.3% of patients spent over four hours in ED, a significant decline in performance when compared with 11.9% recorded in 2018 and 5.5% in 2013 (Baker 2020). Such performance data further convey how the emergency care arena needs to explore alternatives to the traditional ED (e.g. ENP led MIUs, Urgent Care Centres).

Having highlighted the difficulty in maintaining ED services due to the challenges of demand and the workforce, it can be suggested that multiple EDs providing similar services can no longer be efficient, effective and sustainable. This was highlighted by the inception of the 'South Wales Programme' which explored the validity of possible reconfiguration of emergency care services within the South Wales area (NHS Wales 2014). The 'South Wales Programme' acknowledged that multiple EDs delivering similar services fail to provide efficient and sustainable emergency care due to the dilution of medical expertise and the availability of support specialities (e.g. critical care units, theatres, endoscopy, interventional radiology). This situation was also mirrored in Northumberland in England, where a centralisation of ED services was considered and implemented to address the issues of increasing ED demands and the dilution of skill and knowledge due to recruitment problems (Health Foundation 2017a). The reconfiguration of emergency care in Northumberland aimed 'to join up services to allow better decision making and more sustainable use of resources' targeting efficiency, effectiveness and safety of emergency care (Health Foundation 2017a p3).

The 'Five Year Forward View' document for NHS England (2014) suggests that consolidating services, such as EDs, on fewer hospital sites and increasing the use of alternative emergency care services (e.g. MIUs, Urgent Care Centre, Walk-in Centres) would provide a

solution to the difficult and complex decisions required to redesign emergency care services. The document emphasises emergency care services will need to integrate EDs with other urgent care services, such as primary care, urgent care centres, NHS 111 and alternative services such as Emergency Nurse Practitioner (ENP) led Minor Injury Units (MIU).

ENP led MIUs have, in the past, played a pivotal role in diversifying the delivery and reconfiguration of emergency care (Swain et al 2012, Carter and Chochinov 2007). ENP led MIUs may be co-located within a community, district general hospital or Urgent Care Centres (currently not in Wales) and deliver care to patients who present with an injury. MIU services are predominately delivered by a nurse workforce who have engaged with extra training in the assessment and management of patients with a minor injury, and can deliver care without reference to a doctor (Cooper et al 2002). Existing evidence suggests that the care delivered by an ENP is equitable to a doctor, produces effective patient outcomes and is associated with high levels of satisfaction (O'Hara et al 2012, Melby 2011, Swaby-Larsen 2009, Cooper et al 2002). Such evidence suggests any concerns that ENPs are unable to deliver the same standard of minor injury care compared with a doctor are misplaced. The scope and definition of an ENP led MIU remains elusive; however despite a lack of definition the NHS Wales 'Choose Well' campaign (NHS Wales 2020) lists the following conditions as those that can be treated in an ENP led MIU:

- Sprains and strains
- Broken bones
- Wounds and wound infections
- Minor burns and scalds
- Minor head injuries
- Insect and animal bites
- Minor eye injuries
- Minor injuries to the back, shoulder and chest

Although the literature supports the clinical credibility of ENP delivered care and the need to diversify into ENP led MIUs, there is also a need to acknowledge the disconnect between research and the reality of clinical practice. Despite existing evidence supporting the efficacy of ENP led minor injury care, service reconfiguration involving the establishment of ENP led MIUs has significant potential to trigger public concerns regarding the safety and

effectiveness of care delivery (Farrington-Douglas and Brooks 2007). In relation to ENP led MIUs, such concerns may include missed diagnoses, delays in receiving timely interventions, being unable to receive the appropriate investigations (e.g. x-rays, blood tests and access to senior doctors) (Barrett 2012). Emotive public opposition to emergency care reconfiguration is well documented in the media, and frequently raises concerns that the loss of a traditional ED for alternative services (such as an ENP led MIU) equates to a downgrade in service quality (BBC 2020, Caerphilly Observer 2016, BBC 2003). Knowles et al (2018) suggest that such public anxieties appear amplified when related to the reconfiguration of emergency care, as the ED is seen as the 'shop window' of acute hospitals and is part of the hospital most closely in contact with and accessible to the public. It can be argued that patient concerns are generated when the 'shop window' analogy is threatened or fragmented, resulting in a perception of reduced safety and effectiveness of service.

It is accepted that past models of emergency care (e.g. multiple ED sites) are no longer able to provide sustainable services and value for money and complement the needs of patients (NHS England 2013a). Doing nothing is no longer acceptable, and changes in emergency care delivery are inevitable, which has led to centralisation of ED services and on occasions the establishment of services outside the remit of EDs (e.g. ENP led MIU).

However, it can be argued that merely accepting the inevitability of emergency care service evolution is not enough. There is a need to appreciate patients' choices and preference to ensure service redesign is understood and underpinned by robust and targeted engagement and communication strategies. This is important in ensuring appropriate access on first contact with emergency care, thus reducing the inconvenience and frustration of being sign-posted to an alternative service in a differing geographical location (Dalton et al 2016, NHS England 2015). One approach is to understand patient choice with regard to emergency care services and how external factors influence such choice behaviour, especially prior to the planning and implementation of reconfigured services. By exploring how different groups behave towards new ways of delivering emergency care it can be argued that reconfiguration of services can be communicated and implemented in a more informed and targeted manner (Williams and Khaladi 2014, Spurgeon et al 2010).

1.3 Rationale for the Research

It is paramount that the commissioners of NHS service reconfiguration recognise that the public response may not react to or engage with new models of healthcare delivery in a global manner (Fulop et al 2012, Spurgeon et al 2010, Farrington-Douglas and Brookes 2007). Reconfiguration of services may result in many people struggling to understand why a local hospital stops providing a service in order that everyone in the region can receive an improvement in service quality (Barrett et al 2015, NHS Confederation 2013, Spurgeon et al 2010).

A lack of understanding about how reconfiguration may improve the delivery of a service in relation to safety, effectiveness and efficiency (e.g. reduced mortality rates, reduced waiting times, financial savings) may result in conflict, and create poor relationships between local community and local providers of healthcare (Droog et al 2018). Planning of healthcare services is frequently driven by policy makers, managers, commissioners and clinicians, whose ideology of reconfiguration may not always align with the views and preferences of the public (Droog et al 2018, Jones 2015). Guidance frequently cites the importance of patient engagement and communication when considering the successful implementation of service reconfiguration (NHS England 2015, Dalton et al 2016, Kings Fund 2014, NHS Confederation 2014a, NHS Confederation 2013, NICE 2007, Nicholson-Banks 2010).

The issue of local upset is illustrated by the author's experience and reflections gained from replacing a traditional ED with an ENP led MIU within a Welsh health board. Local health board planners acknowledged providing safe and effective care for three EDs was not sustainable, due to the challenges of workforce and resources. The reconfiguration involved the building and opening of a new community hospital, replacing a traditional ED service with an ENP led MIU. The response from the local community to the remodelling of emergency care generated a significant 'wave of consequence'. Despite the new hospital providing an improvement in the clinical environment and hours of coverage (i.e. changed opening hours from 9am-5pm Monday-Friday to 24 hours 7 days a week), the community expressed dissatisfaction with the new clinical model (Gurner 2013b). This resulted in many patients choosing to travel further to access ED care for assessment and management of their minor injury, placing extra demand upon ED services. Many local people believed they were receiving a 'second rate' and 'downgraded' service and chose to travel further to the nearest ED, where they felt more familiar with doctor-delivered care. Such reaction, concern

and opinion were gathered via anecdotal feedback from the local emergency care clinicians, themes of complaints, communication with local MPs and local newspaper headlines (Gurner 2013a). However, although such sources provided useful impressions of how the local community felt about the reconfiguration of emergency care services, it was apparent that such evidence was subjective and required further robust study.

Negative patient responses to service redesign have been reflected by the NHS Confederation (2013), who suggest that reconfiguration of services is seen by many as an attempt to 'rob patients and the public of something important' such as convenience of access, access to appropriate clinician skills and expertise. Although the literature demonstrates the value and benefits of ENP led MIUs the reality of patients' and community reaction to a change in emergency care services does not always reflect the positivity of existing evidence (e.g. shorter waiting times, less missed fractures) (Swain et al 2012, Van der Linden et al 2010, Cooper et al 2002, Chang et al 1999).

The NHS Confederation (2014a) advises that public communication and engagement strategies regarding redesign of healthcare services should reach as many people as possible before and during the process of reconfiguration. By failing to implement an advertising strategy that endeavours to encompass all, it is argued that reconfiguration of services is not responsive to patient needs and views (NHS England 2013a, NHS Confederation 2013, Royal College of Nursing 2013). Such a lack of focused and considered thought regarding how change is going to be communicated, and how patient engagement is going to be sought, needs to be acknowledged by future service reconfiguration strategies. Subsequently the 'lessons learnt' from past emergency care reconfiguration can be considered as a trigger and motivational factor in generating this research.

Although reconfiguration of emergency care services attempts to address the relentless pressures on traditional EDs, there is a need to recognise and acknowledge that reconfiguration of service is not understood and accepted universally by all members of the public (NHS Confederation 2013), it can generate tension and unpredictability (Chapman 2004, Geyer and Rihani 2010). When considering if a change in healthcare service delivery will be embraced and utilised by patients, there is a need to ascertain whether the community will linearly accept reconfiguration and whether the resulting implementation of such services can be sequential and organised (Essén and Lindblad 2013).

It is essential to interrogate a traditional 'reductionist' approach to service reconfiguration and appreciate the factors influencing patient choice and preference when deciding upon a minor injury service. Such variables include patient demographic and socio-economic characteristics. Investigating such factors enables the identification of those people who may be reluctant to consider using an ENP led MIU rather than ED. It is intended that such knowledge will enable more targeted engagement and communication to maximise awareness of ENP led MIUs.

Another rationale for the study is to provide an extra layer of understanding and context, reaching beyond just the ability to predict patients use of minor injury services. This involves understanding how demographic and socio-economic variables influence the reasons behind choice of minor injury service (ED versus ENP led MIU). By appreciating what minor injury services mean to different groups of the population, an increased understanding of patient 'sense making' is possible (Pope et al 2018), that is, what factors play a role in decision making when choosing a minor injury service.

The final rationale is to be able to inform policy regarding emergency care service reconfiguration, particularly in relation to the diversification of minor injury services.

1.4 Thesis Structure

The following section will summarise and justify the structure of the thesis.

1.4.1 Literature Review

To establish a contextual position for the thesis, this chapter will review the literature in relation the reconfiguration of emergency care services and choice of minor injury service. The evidence review will be conducted using a systematic search strategy and will provide a critical appraisal of the existing evidence. The findings of the literature review will be conceptualised using the framework of complexity theory, which will then lead onto the establishment of the variables of interest. The chapter will conclude by summarising the research question, aims and objectives.

1.4.2 Methodology

This chapter will outline the methodology used to address the research question, aims and objectives. An overview of the study setting, and design will be provided followed by a detailed description of how the survey instrument was designed, developed, and implemented. The chapter will continue with a discussion of study rigour, which will include

the results of a pilot study. The ethical and governance considerations will then be discussed and summarised. Finally, the approach to data processing and analysis will be discussed and justification provided for the chosen statistical tests.

1.4.3 Results

This chapter will provide a detailed summary of the descriptive statistics underpinning the study, including a comprehensive synopsis of the demographic and socio-economic profile of the participants, the local population statistics, and the characteristics of the wider ED population (non-sampled). The chapter will continue by presenting the results of the main analysis.

1.4.4 Discussion of Findings

The chapter will begin by discussing the generalisability of the findings to the local population. The discussion will then compare the findings with existing, related evidence to establish how the findings have built upon current knowledge. Discussion will then focus on the implications of the findings, with attention aimed at the establishment of a targeted patient engagement and communication strategy, regarding reconfiguration of minor injury services. The discussion will then discuss the limitations and challenges of the study. Finally, the chapter will conclude by suggesting a suite or recommendations for practice, future research and policy.

1.4.5 Conclusion

The concluding chapter will start by reviewing the research aims and overriding research question. The chapter will continue by discussing how the study has contributed to original knowledge and identify the impact of the findings. The chapter will close by highlighting and summarising the key points generated by the study.

1.5 Chapter Summary

This chapter has established that emergency care across Wales and the rest of the UK is fraught with challenges threatening the delivery of effective, efficient, and safe care. Such issues include those associated with rising demand resulting from an ageing population and an increase in patients living with chronic conditions. In addition, the difficulty with recruiting emergency care doctors, jeopardises the provision of sustainable ED care.

In response to such challenges, policy ascertains that clinical models of emergency care service delivery need to change. The chapter identifies that one possible solution to the model of emergency care delivery is centralising ED care and diversifying through alternative services such as ENP led MIUs, where nurses are known to have the skills and knowledge to be able to provide safe and effective care.

The chapter acknowledges centralisation and associated diversification of services is not without its challenges, particularly in relation to emotive public concerns and/or opposition. Such public reaction is illustrated by the author's previous experience of replacing a local ED with an ENP led MIU. The rationale and motivation for the study originates from being involved in such a reconfiguration and the 'lessons learnt' regarding the lack of targeted patient engagement and communication. Consequently, the rationale underpinning the study involves the need to investigate the ability to predict preferences in relation to minor injury services (ENP led MIU versus ED) using the characteristics of the patient population. The rationale supporting the study continues to assert that, as well as being able to predict choice behaviour there is also a need to understand the reasons behind such preferences. The impetus for the study is the need to generate knowledge able to inform a more targeted public engagement and communication strategy, with the aim of maximising awareness of ENP led MIUs and reducing the potential patient inconvenience and dissatisfaction of being redirected away from an ED to an ENP led MIU in a different geographical location.

Chapter 2 Literature Review

2.1 Introduction

The chapter will begin by outlining the search strategy used to identify the pertinent literature. The chapter will use the results of the literature search to chronicle the evidence investigating two aspects of emergency care services, that being the process of reconfiguration and redesign of emergency care services and patients' choice of minor injury services. The chapter will conclude by conceptualising the results of the literature review using complexity theory, which, in itself will also be discussed in more detail later in the chapter. Conceptualising the literature review will identify the variables taken forward for further investigation.

2.2 Search Strategy

The search strategy aimed to review relevant published and unpublished studies up to and including 2019. It was decided not to limit the literature search to 'age of study' as it was believed that valuable 'older' studies may be overlooked whilst still providing appropriate context and/or relevance to the research question and aims. The literature search was restricted to papers written in the English language due to limited time and resources available for translation (Arksey and O'Malley 2005).

A search of quantitative and qualitative studies was conducted using the databases CINAHL, PubMed, Medline and British Nursing Index. Each of the databases was searched with Boolean operators or Medical Subject Headings. After an initial literature search it became apparent that literature exploring patient choice of minor injury service was limited. Therefore, it was decided to widen the search to include evidence investigating patient choice of emergency care service when presenting with a non-urgent condition. The decision was made as it was felt a minor injury could be classified as a non-urgent condition. The search strategy used the framework of population, phenomenon of interest and context (PICO) (Eriksen and Frandsen 2018) to plan the combination of search terms (see Table 2.0).

In conjunction with the main search strategy, a generalised web search was also conducted to enable identification of possible 'grey' literature or policy documents that may not be available when searching the available data bases. This was done by searching the web browser Google and using the search tool OpenGrey (systems for information on grey literature in Europe).

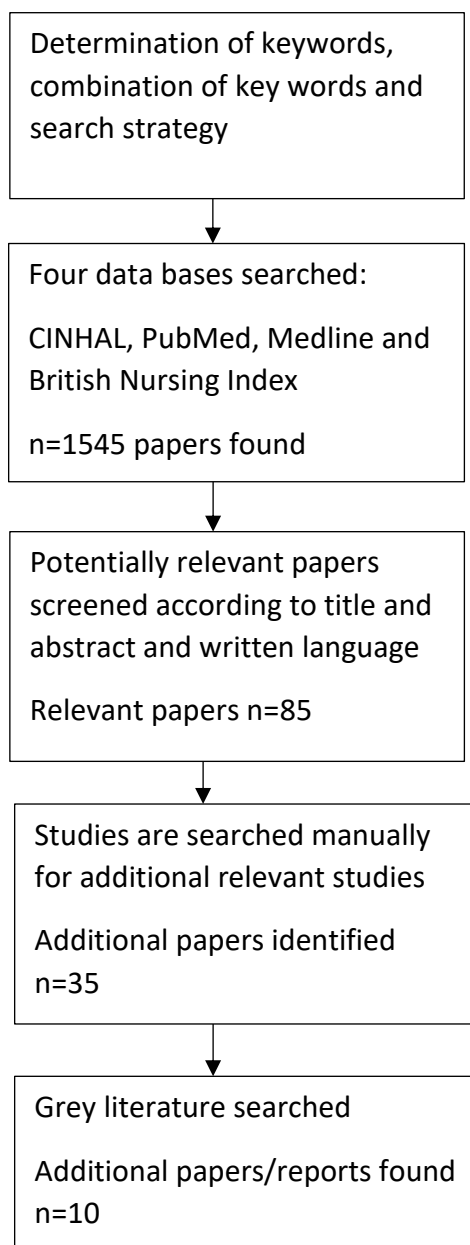
Table 2.0 Combination of Search Terms

P.....Population	I..... Phenomenon of interest	Co.....Context
Patients using emergency care services	The views/preference/choice of patients when selecting a minor injury service The views/preferences/choice of patients using emergency care for non-urgent conditions Characteristics of people using MIUs and using ED for non-urgent conditions	Reconfiguration of emergency care services Minor injury units Use of emergency care for non-urgent care conditions
Patients OR Public OR People*OR Users *OR Demographic*OR Socio-economic*OR Characteristics*	Preferences*OR Choices*OR Views*OR Attitudes*OR Satisfaction OR Opinions*OR Beliefs*OR Utilisation	Emergency Departments*OR Accident and Emergency* OR Emergency services* OR Emergency Room OR Minor injury* OR Minor injury Unit OR Urgent care OR Emergency Nurse Practitioners * OR ENPs* OR Reconfiguration* OR Emergency care reconfiguration OR Service redesign*OR Service modernisation* OR Centralise*

Because the study was conducted and written over six years there was a possibility that new literature would be published within such a time period; therefore the author set up alerts (e.g. emails) to identify publication of new studies and repeated the literature search on a six- monthly basis. Any new, pertinent literature identified via such means was incorporated into the literature review. The literature search results were collected and organised using the citation management tool EndNote Web.

The final stage of the search strategy necessitated a search of the reviewed studies for further evidence not identified in the primary search. This process is known as ‘snow balling’ (Greenhalgh and Peacock 2005) and assists in identifying literature that may have slipped through the database searches, especially if papers contain abstract titles not picked up by search terms. Fig 2.0 summarises the search strategy results.

Fig 2.0 Search Strategy Results



The search strategy indicated 130 papers taken forward for review.

To appraise the papers identified by the literature search, appropriate, design-specific frameworks from the Critical Appraisal Skills Programme (CASP) (2018) were utilised. As the literature review explored both quantitative and qualitative literature, it was necessary to

consider an appraisal tool that accommodated both approaches. The CASP resource presents a raft of tools used to critically appraise evidence according to methodology; as a result, it is possible to select an appropriate tool according to the nature of the paper being reviewed (e.g. quantitative or qualitative). This was deemed suitable as the review included exploration of both qualitative and quantitative papers.

2.3 Updated Literature Search

After completion of the study it was deemed useful to return to the literature, to identify any new evidence investigating service reconfiguration/redesign in emergency care and/or any other health service. This new evidence would include any papers published in the period between the initial literature search and completion of the research (2018-2020). A return to the literature enabled a comparison of the new evidence with the findings of study.

To enable an updated literature search the original combination of search terms was amended. This is tabulated in Table 2.2.

Table 2.2 Updated Combination of Search Terms

P.....Population	I..... Phenomenon of interest	Co.....Context
Patients using emergency care services	The views/preference/choice of patients when selecting a minor injury service	Reconfiguration of emergency care services
Patients involved in/affected by reconfiguration of healthcare services	The views/preferences/choice of patients using emergency care for non-urgent conditions	Redesign of emergency care services
	Communication	Minor injury units
	Marketing	Reconfiguration of healthcare
	Advertising	Redesign of healthcare
	Awareness	
	Co-production	
Patients OR	Preferences*OR	Emergency Departments*OR
Public OR	Choices*OR	Accident and Emergency* OR
People*OR	Views*OR	Emergency services* OR
Users *OR	Attitudes*OR	Emergency Room OR
Demographic*OR	Satisfaction OR	Minor injury* OR

Socio-economic*OR Characteristics*	Opinions*OR Beliefs*OR Utilisation	Minor injury Unit OR Urgent care OR Emergency Nurse Practitioners * OR ENPs* OR Reconfiguration* OR Emergency care reconfiguration OR Service redesign*OR Service modernisation* OR Centralise*
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The updated literature search yielded two new papers, tabulated in Table 2.3

Table 2.3 Findings of Updated Literature Search

Author	Year	Title
Brown	2020	The Drivers and Impact of Emergency Care Reconfiguration in Ireland: Results from a Large Mixed-methods Research Programme
Stewart et al	2020	Transforming Health Care: The Policy and Politics of Service Reconfiguration in the UK's Four Health Systems

The discussion of the papers outlined in Table 2.3 can be found in section 2.10.

2.4 Reconfiguration of Emergency Care Services

The following section of the review will explore relevant literature investigating the discourse surrounding reconfiguration of healthcare services, with a focus on emergency care redesign.

The term reconfiguration has been used in the context of health policy in the UK to express modifications to hospital services. Fulop et al (2012) argue the term reconfiguration does not have an accepted meaning, and subsequently is open to interpretation, often by a diverse group of stakeholders. This is illustrated by Spurgeon et al (2010) who claim that, as stakeholders of reconfiguration, the public may interpret such a term as a euphemism for 'cutbacks' with changes driven by financial concerns or what can be seen as a 'down grade'

of services. This may conflict with clinicians and service commissioners who may define reconfiguration as an attempt to improve patient outcomes. However, despite the difficulties with definition, Fulop et al (2012) propose the following definition, which particularly resonates with emergency care service reconfiguration, as it frequently diversifies services across multiple sites:

'A deliberately induced change of some significance in the distribution of medical, surgical, diagnostic and ancillary specialties that are available in each hospital or other secondary or tertiary acute unit in locality, region of health care administrative area' (p.129).

For the reasons outlined above, this is the definition of service reconfiguration that will be used in this thesis.

2.4.1 Diversification of Services

A review of the related evidence suggests one approach to emergency care reconfiguration is diversification to alternative service provision, this involves outsourcing to alternative models of care, predominately for non-urgent conditions (e.g. minor injury or illness) (Knowles et al 2012). The literature describes such alternatives as Walk-in Centres (excluding Wales) (Chalder et al 2007, Salisbury et al 2002), Urgent Care Centres (Weinick et al 2010), MIUs (Sturgeon 2018, Rubin 2012) and NHS direct/NHS 111 (O'Cathain 2007).

The outsourcing of services traditionally provided by ED has been seen by some as the panacea to reducing demand on EDs (RCEM 2015, NHS England 2013b, Salisbury et al 2002). However, numerous papers have claimed diversifying emergency care options has seen little impact upon solving the ED demand problem and patients still migrate to ED care with more minor ailments (e.g. minor illness or injury) (Knowles et al 2018, Munro et al 2000, Turner et al 2013, O'Cathain 2007). Such behaviour appears to be in conflict with the significant body of literature investigating patients' satisfaction and willingness to use ENP led services, which predominately reports a high level of satisfaction and engagement with such services (Barr et al 2000, Byrne et al 2000, Carter and Chochinov 2007, Ezra et al. 2005, Jennings et al 2015, Sandhu et al 2009, Swaby-Larsen 2009, Swain et al 2012). When reviewing such collective research, it was evident such studies typically surveyed patients during their engagement with such service, suggesting a bias towards, patients who had experienced an ENP led minor injury service. The views of people who had not previously experienced care delivered by an ENP led MIU can therefore be considered a notable gap in existing knowledge and requires attention.

In contrast to the significant body of research exploring the concept of the ENP role, the literature review only yielded a small number of papers investigating patients' perceptions and views of using ENP led MIUs (Mukamel et al 2019, Sturgeon 2018, Saunders 2000, Dolan and Dale 1997). It can be argued that although patients may express positive views and a willingness to engage with ENPs, this may not necessarily be the case if the minor injury service was moved out of a traditional ED and moved to an ENP led MIU located away from the main ED.

One of the few studies exploring how and why patients make choices about minor injury care was conducted by Sturgeon (2018), who employed a comparative case study approach between October 2014 and May 2015 exploring patient attitudes and behaviour when accessing MIU services with a condition that could have been managed at a GP surgery. The study involved the researcher being embedded as an ENP at two MIUs in the South of England; the researcher undertook direct and participant observation and conducted semi-structured interviews with 40 patients, 17 service providers and one manager. The research settings involved two MIUs as they provided minor injury care in a context where patients had a choice about minor injury services; unfortunately it was unclear what form such service choice took. The findings suggested that all the patients wanted to have choice in the minor injury service care they received and this was echoed by service providers who supported shared decision making and co-production of care, as long as such choices did not contradict clinical guidelines or result in harm.

However, Sturgeon (2018) highlights that this may result in conflict and confusion when patients are encouraged to have freedom of choice, whilst organisations are endeavouring to signpost patients to what they perceive as the most appropriate provider. This paper could be criticised for a degree of sampling bias. Although the sample was selected randomly from patients attending the MIUs, the interviewed participants were satisfied with the care they had received and had the time and inclination to share the reasons behind such choice. This sampling bias signified the possibility of omitting the views of patients who may not have had such positive experiences of the MIU service. It was also notable that the over 76years age group was underrepresented, with only two participants falling into such a demographic. The work of Sturgeon (2018) resonates with the context of this present study and emphasises the need to understand and acknowledge how patient choice and reconfiguration of emergency care services may be in conflict.

Mukamel et al (2019) also investigated patients' preferences regarding care settings for minor injury and illness. The study set in California used convenience sampling to survey 5451 participants from a possible population of 21,037. The sample was made up from employees and retirees of the University of California. The study accounted for a considerable sample size; however, as all participants worked/had worked for the university generalisability to local context may be questionable. The participants were presented with 10 clinical scenarios (made up of minor injury and illness) and asked to choose the service in which they wanted to receive care. The study found that patients chose urgent care clinics for conditions with less severity (e.g. minor injury/illness). A noteworthy limitation of the study was that the data collated were based on hypothetical scenarios, which may produce different responses compared with actual behaviour to actual situations people have experienced. It could also be argued that participants may respond to the questions in a way which they think is expected from them, thus failing to capture their real choice behaviour.

The literature review in the current study has established that ENP led MIUs are frequently implemented as part of emergency care reconfiguration. Considering such a finding it is prudent to explore the evidence investigating patient's choice behaviour when selecting a minor injury service. The subsequent literature review addresses this.

Discussion about the need to encourage patients to use alternative services other than ED (e.g. nurse led MIUs) cultivates the notion that patients need to understand such services and how to use them, especially for non-urgent conditions (Department of Health 2009). However, Williams and Khaldi (2014) suggest that before we can persuade and influence patients to engage with health services, we need to comprehend patient choice and preference behaviour. Such reflections are articulated by Williams and Khaldi (2014) in a paper describing emergency care service reconfiguration conducted by Sandwell and West Birmingham Clinical Commissioning Group. The authors assert that patients tend to behave rationally because, over time, EDs have manufactured their own demand by convenience of service, location and meeting expectations. Essentially, a 24-hour service which provides timely care, and is relatively easy to access can be more attractive than having a lengthy wait for an inconvenient GP appointment, or spending more time and cost travelling to a service (such as an ENP led MIU) that may be located further away. This situation can be summarised in the phrase 'a victim of their own success' and can play a role in increasing ED demand. Williams and Khaldi (2014) advocate that commissioners need to shift their

thinking regarding successful emergency care service re-design by using demand data to shape reconfiguration strategies. Such demand data includes patients' preferences and choices, which adds to the understanding of why patients act as they do, and what characteristics and motivation influence choice behaviour. Considering such views, the following section of the literature review will examine the existing evidence regarding the variables that may influence patients' choices when deciding upon a service to treat their minor injury.

In summary, despite the literature highlighting how some emergency care reconfiguration models involve planning for and implications of ENP led MIUs (Health Foundation 2017a, RCEM 2015, Simpson 2001) there is little investigation into patients' views and preferences regarding the delivery of minor injury care via an ENP led MIU. This accounts for a significant gap in the existing evidence base and requires further investigation.

2.4.2 Centralisation of Emergency Care Services

Having referred to the current affinity for centralising EDs to fewer sites, the following section will explore the literature discussing the centralisation of healthcare services, with focus on its application to emergency care services.

The literature review illuminated how, in recent years the commissioners of emergency care in the UK have looked beyond just providing alternative ED services (e.g. MIUs, UCCs, walk-in centres) by planning and implementing centralisation of services (Droog et al 2018 Knowles 2018, Health Foundation 2017). Such redesign relies on concentrating skills, knowledge, and diagnostic/interventional technology, equating to more specialised care for complex conditions (Droog et al 2018). The current inclination for EDs to centralise care is reflected by the numerous reports and papers describing such reconfiguration (Health Foundation 2017a, NHS Confederation 2013, Kings Fund 2014, Metcalf et al 2014, Droog et al 2018, Simpson 2001).

There is a significant body of research claiming centralisation of EDs improves quality of care and results in better patient outcomes (e.g. mortality rates, early diagnosis and, timeliness of interventions) (Health Foundation 2017a, Bhattarai and McMeekin 2016, Farrington-Douglas and Brooks 2016, NHS Confederation 2013, Metcalf et al 2014, Gabbe et al 2012, Freeman et al 2006, Keeley et al 2003). In guidance documents regarding reconfiguration of health services, the Kings Fund (2014,2011) contends that emergency services gain from

being consolidated. Such documents claim that by galvanising services, clinical expertise, and diagnostic/interventional technology for the most complex patients (e.g. severely injured, life threatening conditions) patient outcomes and quality of care are improved. Such conclusions drawn by the Kings Fund (2014,2011) are supported by other studies acclaiming the benefits associated with high patient volume over fewer ED sites. Examples include primary angioplasty for acute myocardial infarction (Keeley et al 2003) and improved survival rates for major trauma patients (Metcalf et al 2014, Gabbe 2012, Freeman et al 2006).

As well as arguing that centralisation of EDs produces a tangible improvement in patient outcomes, the literature also provides examples of how such service redesign leads to an improvement in other quality indicators, such as timeliness of care. A case study encapsulating such a notion can be found in the reconfiguration of emergency care services in Northumberland (Health Foundation 2017a). During March 2015, a redesign of existing emergency care services aimed to ‘join up services to allow better decision making and more sustainable use of resources’ (Health Foundation 2017a). This involved developing a partnership between Northumberland Clinical Commissioning Group (CCG) and the Northumbria Healthcare NHS Foundation Trust; this affiliation formed a primary and acute care system (PACS). The reconfiguration of services involved building and commissioning a new specialist care hospital, the first of its kind in the UK. The aim of the service redesign was to provide more timely and higher quality care to seriously ill or injured patients, by improving the access to specialist medical teams and diagnostics. The plans involved the three original EDs shifting their focus to delivering urgent care to patients with minor injury and illness. Such units were staffed with a combination of GPs and ENPs.

An evaluation of the new services was conducted by the Health Foundation in 2017 using the relatively new synthetic control method. Such an approach involves measuring the effect of an event or policy intervention in comparative case studies. The evaluation involved selecting 20 Clinical Commissioning Groups (CCG) in England with similar characteristics to the Northumberland CCG (e.g. number of GPs per capita, prevalence of common diseases) and using them as synthetic control areas. The study then created a raft of impact metrics reflecting how individuals used hospital care. The data were then compared with the 20 control CCGs (which had not undergone the same model of emergency care reconfiguration). The evaluation found that changes to the emergency care

service were associated with an initial 13.6% increase in attendance (across all sites). However, despite this increase in demand, the average stay in ED was 14.3 mins shorter than compared with the control sites and the performance against the four-hour transit time was 91.8%, significantly better compared with the 85.2% found in the control sites. This novel approach provided robust information regarding the impact of emergency care reconfiguration. The study allowed comparison with a raft of other CCGs enabling the generation of comprehensive comparative benchmarking. However, the report failed to explore or acknowledge the impact of patient views on the reconfiguration; thus the report appeared to have a focus on efficiency without considering the experiences of the patients using the new model of care delivery.

A second case found in the literature involves the centralisation of UK ED sites in the city of Sheffield (Simpson et al 2001). The authors investigated the outcomes of merging the city's EDs into two sites, that being the Northern General Hospital and Sheffield Children's Hospital; this resulted in the Royal Hallamshire ED being closed and replaced with an ENP led MIU. The study presents data collected over the three years post reconfiguration, using the ED computer system and available financial data. The study presented data regarding patient outcomes (e.g. treatment of chest pain) and the cost efficiency of ENP led MIUs. As with the Northumberland experience (Health Foundation 2017a) there was an increase in attendance at the adult ED; however, unlike Northumberland the adult ED experienced a deterioration in waiting times post reconfiguration, with a 5% reduction in those being seen or discharged within four hours (the waiting times remained unchanged in the paediatric ED). It was argued that the centralisation of ED to two sites resulted in the adult ED seeing more complex patients; therefore any patients presenting with minor injury or illness had to wait longer. This finding indicated that patients continued to use ED for a minor injury despite there being an alternative MIU service available providing shorter waiting times (98% of patients seen in four hours). Although the study describes data about inappropriate attendance at the MIU (e.g. chest pains, collapse, renal colic, overdose, asthma), it fails to articulate how many minor injury patients attended the adult and paediatric ED, that would have been more appropriate for the new ENP led MIU.

Both the Northumberland and Sheffield experiences describe how the reconfiguration of emergency care into fewer ED sites and co-managed satellite MIUs have improved the quality of care delivered. However, both studies have given little attention to the patient

perspective regarding the benefits (or not) of reconfiguring the minor injury service. Both papers have been written from the perspective of non-patient stake holders (service commissioners, managers, and clinicians) and fail to articulate the patient choice and reasons for such choice behaviour and the influence of patient characteristics (e.g. demographics, socio-economic profile). Such an omission suggests such an evaluation of emergency care reconfiguration has missed the opportunity to investigate the preferences of the community regarding where they access minor injury care (ED or ENP led MIU). This extra layer of knowledge would have helped to identify any patient groups that may require more engagement and information about ENP led MIUs.

In summary, this literature review indicates that centralisation of EDs is currently the focus of numerous models of emergency care delivery. A raft of studies suggest that efficiency and effectiveness of emergency care is improved by reducing the number of sites delivering a traditional ED service. However, it can be argued the generation of such research perhaps has somewhat paternalistic aims, that is, to persuade the public that centralisation of EDs will provide benefits that outweigh any losses. Considering this argument, it is important that future research begins by exploring factors that may influence choice and preference and the issues that may create a barrier to using ENP led MIUs compared with EDs for a minor injury service.

The literature review yielded a limited number of studies examining the delivery of minor injury care in the centralisation of emergency care services, particularly in relation to patients' views and choice behaviour; this accounts for a gap in the present knowledge. However, the literature review did generate a significant amount of literature that explored patients' perspectives regarding the implementation of healthcare services in general. The following sections will critically discuss such a body of literature.

2.5 Reconfiguration of Emergency Care Services – The Patient Perspective

Despite the publication of literature suggesting centralisation of EDs improves patients' outcomes (Health Foundation 2017a, Bhattarai and McMeekin 2016, Farrington-Douglas and Brooks 2016, NHS Confederation 2013, Metcalf et al 2014, Gabbe et al 2012, Freeman et al 2006, Keeley et al 2003) evidence and discourse suggests not all patient groups are convinced of this and accept such benefits. The following section will review the evidence exploring how people view and engage with the reconfiguration of healthcare services, with specific focus on emergency care.

UK policy suggests reconfiguration of emergency care services should be underpinned by evidence and such testimony should be shared with the public experiencing the change in services (NHS England 2014). Policy and guidance documents appear to promote the notion that the public will be convinced about the benefits of emergency care service design by listening to the evidence, and that this alone will result in an acceptance of services changes (Spurgeon et al 2010). The evidence from a wealth of stakeholder interviews and media sources suggests this viewpoint is somewhat optimistic. Review of the literature suggests that centralisation of services frequently prompts public controversy and opposition (Farrington-Douglas and Brooks 2007, Barratt 2012, Telegraph 2007, BBC 2020).

A body of research acknowledges that reconfiguration of healthcare services should not rely upon people's passive acceptance that service redesign will enhance healthcare outcomes (Barrett et al 2015, Fulop et al 2012, Spurgeon et al 2010, Farrington-Douglas and Brookes 2007). A study arguing such a notion was conducted by Farrington-Douglas and Brookes (2007), which investigated the politics and process of hospital reconfiguration by interviewing 28 stakeholders' on their views of service redesign. The study recruited the participants from two case studies of recent hospital reconfiguration. The dominant findings centred on participants' acceptance of the need for change, but the preference for the services to be centralised at their local hospital, a concept labelled as 'hospital in my backyard' (HIMBY). Although the study produced novel evidence, it can be criticised for its sampling strategy. The patient stakeholders were recruited from public groups, including hospital campaigners. It can be argued that such an approach may have created a significant bias, as such patients already had negative views of reconfiguration, which may not represent views of the wider patient population.

Such a critique is reflected by Dalton et al (2016) in a rapid systematic review of the literature exploring user engagement in health service reconfiguration. The systematic review found much of the evidence discussing healthcare service reconfiguration and associated patient involvement and views, was written from the perspectives of service commissioners and decision makers responsible for the service change. The authors warn that successful engagement and gathering of consensus and opinion regarding service redesign may need to look at a wider range of patient and public perspectives.

In a two-site UK study, Barratt et al (2015) explored factors that influence the way communities respond to proposals for major changes to local emergency services. The cross-

sectional study involved in-depth interviews and involved participants selecting their priorities for emergency care, taking into account what they might be prepared to have 'less' of (e.g. ease of access) if it meant having 'more' of (e.g. access to consultant-delivered care). The sample involved 28 participants split over two sites, one where changes to emergency care services were being considered and one site where they were not. The sample interviewed from the site considering reconfiguration included parents of children attending ED (n=5), older people (n=6) patient representatives and individuals campaigning against service closures (n=9). The sample from the site not undergoing reconfiguration included patients who were receiving outpatient care for Chronic Obstructive Pulmonary Disease (COPD). The justification for this sampling was that COPD patients were frequent users of emergency care services. The results found that most participants were not willing to accept the trade-offs involved in centralisation of EDs on fewer sites (e.g. travelling further). Barratt et al (2015) rationalised such a finding by suggesting patient and expert scientific opinion is at odds regarding the risk associated with centralisation of services. That is, many patients typically believe that timely access to ED correlates with improved outcomes (e.g. time to treatment, reduced mortality rates). However, the commissioners of services and some clinicians use evidence supporting the belief that centralisation of expertise and resources are attributes that improve aspects of quality (e.g. mortality rates) not the time taken to access the ED.

The study by Barrett et al (2015) can be also be criticised for using patients who did not represent the wider community. The study failed to articulate the views of all demographics and socio-economic groups and failed to justify the exclusion of certain patient groups (e.g. on the basis of age, gender, ethnicity). The use of participants from one chronic disease group (COPD) can be considered limited and not mindful of the views of other patients.

Another study investigating factors influencing the process and results of emergency care reconfiguration can be found in the work of Fulop et al (2012). The paper explores three case studies of emergency care service redesign across the UK. By means of semi-structured interviews the paper analyses the views of stakeholders at each site, including those of the local community. The views of the local patients were sought via accessing the government committees responsible for reviewing decisions, performance, and policy of local NHS organisations on behalf of the community. However as with previous studies (Barrett et al 2015, Farrington-Douglas and Brooks 2007) the study could be criticised for not being

representative of the wider population, that is, using data from committees representing local communities rather than from the actual patients engaging directly with the emergency care services. The literature review has suggested there is a need for more detailed investigation of how patient demographic and socio-economic characteristics may shape their preference and engagement with new reconfigured healthcare services.

Such a knowledge gap is acknowledged by Hansen et al (2011) in a paper exploring the use of healthcare services associated with ED closure in two geographical locations in Denmark. The authors recognise their study would have benefited from investigating how socio-economic characteristics influence patients' use of emergency care services after a change of emergency care provision. This is also reflected by Langer et al (2013) in systematic review of why patients with long-term conditions use unscheduled care. Langer et al (2013) argues the research agenda provides minimal attention to demographic and socio-economic characteristics and how they may influence preference of emergency care service. Although the paper does not directly relate to the reconfiguration of emergency care services, they present a transferable argument. That is, health policy pertaining to emergency care delivery and reconfiguration may oversimplify how patients choose emergency care services and how preferences may be influenced by a more complex system of patient characteristics.

The lack of literature capturing the choice behaviour of differing demographic and socio-economic groups and why they may oppose healthcare reconfiguration, threatens the integrity of the papers, reports and legislative requirements which recommend a robust understanding of how the public will react or respond to service redesign (NHS England 2014, Ryan et al 2001, Shah and Cook 2008, NHS 2006). In a document outlining how to plan and deliver service reconfiguration, NHS England (2014) encourages the formation of a detailed plan which articulates how all groups within the local community are going to be reached and informed of the service changes. To ensure such a recommendation is achieved the paper advocates that preferences and choices of local patients' need to be measured and integrated into robust reconfiguration strategies. The document recognises the argument proposed by the paper 'Five Year Forward' (NHS England 2014), that one of the principal strengths of the UK NHS is 'of the people, by the people and for the people'. This notion reinforces the need to understand choices and health-seeking behaviour when endeavouring to implement service reform. As Shah and Cook (2008) maintain national and

local policy regarding emergency care reform necessitates a detailed understanding of utilisation patterns, and the influence of preference on the impact of service change.

It is apparent from the existing literature that despite significant acknowledgement about the importance of capturing patient opinion and choice behaviour regarding reconfiguration plans, there is lack of tangible evidence that such knowledge is being generated. This situation is articulated in a novel discussion paper by Stewart and Aitken (2015). The paper compares public attitude to reconfiguration of healthcare services (particularly hospital closure) to the planning and building of wind farms and the resulting controversy. The authors claim that literature pertaining to public responses to wind power has evolved over the past 10 to 15 years via a reflexive process of critique and identification of previous limitations of the empirical evidence. The discussion argues that the literature regarding public opposition to wind farms has moved beyond simplistic description of public opposition and towards studies with robust methodological approaches to exploring the complexities of public views and preferences. Steven and Aitken (2015) argue that reconfiguration of health services would benefit from such a response and would improve understanding rather than simply managing or surmounting public responses. This is reiterated by The Kings Fund (2014) who claim that those who are tasked with major clinical service reconfiguration frequently do so without the assistance of a clear evidence base or robust research methodology with which to plan and shape judgements.

This lack of understanding about how people may behave is pertinent to emergency care reconfiguration. The review of the literature only identified a single study investigating patient preference regarding service redesign within the urgent care arena.

This lone paper by Gerard et al (2004) measured strength of preference for attributes associated with out of hours emergency care in Nottingham, UK, a service undergoing redesign in its model of delivery. Gerard et al (2004) conducted a discrete choice experiment to quantify preferences for key attributes of out of hours emergency care. A discrete choice experiment is a quantitative method that elicits participant preferences by posing a series of hypothetical scenarios with an associated number of attributes. The responses are used to determine whether the preferences were influenced by the associated attributes. A self-completion questionnaire was distributed to adults attending ED and accessing NHS Direct (telephone advice line). There was a good response rate of 74% (n=457), although only 61% (n=378) were useable. However, this can still be considered an acceptable response rate

when using surveys as a method of data collection (McColl et al 2001). The discrete experiment study found the participants had a significant preference for how out of hours emergency care should be organised. It was found that all attributes of emergency care (e.g. making contact, being advised of waiting times, quality of contact) were found to be significant predictors of emergency care service for the management of non-urgent conditions. The strongest preference elicited by the participants was being advised or seen by a doctor rather than an alternative health professional (e.g. NHS direct telephone advice line, paramedic), although consultation with nurse practitioners was deemed acceptable. The study also found that participants preferred to be kept informed about waiting times and have face-to-face contact with a healthcare professional, rather than telephone calls. The participants also expressed a preference of having reduced traveling distances to access services and finally short waiting times between initial contact and being advised or treated. Finally, the study found that participants were willing to forgo differing waiting times if it meant that they received a perceived improvement in care (e.g. the average respondent was willing to wait an extra 2 hours 20 minutes to be seen by a doctor, rather than an alternative clinician such as an ENP).

The main limitations of the study lay in its ability to be representative of the population. For example, the study focused on the users of emergency care services for whom the questionnaire was pertinent and the wider 'non-patient' population was not surveyed. The study sample was only made up of 4% of people over 65 years which could equate to an underestimation of the older healthcare users. The authors acknowledge a significant weakness of the study lay with how participants perceived the attributes that were described (e.g. who provides advice - paramedic, specialist nurse, or doctors, waiting times).

However, despite such limitations Gerard et al (2004) argue the value of their approach and findings enables a measurement of preferences for a service not yet operational, which is particularly useful in analysis of possible service reconfigurations. The paper argues that local decision makers need to be able to predict how patients may respond to local service reconfigurations and what is important to them, in order to plan awareness and education strategies. The focus on patient choice behaviour and being able to predict behaviour in future service redesign is therefore a novel perspective and a lens that has not been adequately employed in the current literature.

The points presented by Gerard et al (2004) are more pertinent when appreciating the comments by Clarke and Rozansky (2013) in a discussion paper describing their experience of working on the 'Better Services, Better Value' programme in South-west London and Epsom and 'Shaping a Healthier Future' in North West London. The authors assert that engagement with patients and the public regarding service reform is not a referendum; the engagement accepts that change is required but is interested in how that change can produce the best outcomes for the population. This recognises that reconfiguration of emergency care services is frequently a 'fait accompli' and will go ahead independent of patient views or opinion.

However, Clarke and Rozansky (2013) found during their experience of service redesign, that changes to service provision are most likely to be successful when the preferences and suggestions of the local population are considered and valued. This is reinforced by Williams and Khaldi (2014) in a paper investigating the motivation for attending EDs and walk-in-centres in Sandwell and West Birmingham. The authors claim that if we want people to behave differently (such as with reconfiguration of services) then we need to understand why they are moved to act as they do, not just superficially but in terms of their motivations, beliefs and preferences. They assert by digging deep into the patterns and preferences of the local population provides more meaningful data ensuring a more focused, informed reconfiguration of services and any patient communication and engagement strategy.

In summary, after reviewing the existing literature investigating the reconfiguration of emergency care services there is a lack of detailed and compelling research from the perspective of public opinion and preferences, particularly in relation to the reconfiguration of emergency care and minor injury services. Current evidence can be criticised for not listening to all groups of the community and failing to consider how patient demographic and socio-economic characteristics may influence how people behave when faced with the introduction of new healthcare services (such as ENP led MIUs). This is reflected by Barratt and Raine (2012), who suggest the body of evidence regarding patient and public opinion and preferences is not robust. Barratt and Raine (2012) argue the research agenda needs to create a better understanding of what concerns the public, and the trade-offs patients are prepared to make when considering major service change. They suggest that this knowledge would better inform communications and engagement strategies with the general public. Finally, the literature review has revealed a tendency for existing research to explore the

views and choices of patients and communities when reconfiguration of healthcare has been implemented. Consequently, there is scope for research to focus upon collating evidence prior to the changes in service delivery, thus taking on a more prospective approach.

As mentioned previously, an integral part of understanding the patient's perspective regarding reconfiguration of emergency care services is to appreciate the factors patients are willing to 'trade off' (Barratt and Raine 2012). Such factors frequently involve those associated with 'economic burden' (e.g. travel costs). The following section will therefore examine the evidence investigating the 'economic burden' upon patients associated with reconfiguration of emergency care services.

2.6 Reconfiguration of Emergency Care – Patients 'Economic Burden'

Having reviewed the literature investigating the approaches to emergency care reconfiguration and how patients may react and behave within the new model, a dominant theme emerged, that being the economic implications for patients. The following section will investigate the research exploring such a theme.

Much of the literature regarding the justification for ED centralisation discusses how the economic merit or 'value for money' is a driving force. Essentially, centralisation of services and reduction of service replication is a means of reducing costs whilst enhancing quality (Health Foundation 2017a, Kings Fund 2014, Posnett 1999). However, Bhattarai and McMeekin (2016) articulate it is not just about considering the redistribution of limited resources. There is also a need to reflect on possible secondary or unpredictable economic effects produced by reconfiguration, particularly on patients accessing alternative services to ED (e.g. ENP led MIU). Bhattarai and McMeekin (2016) maintain that local health service budgets may benefit; however, this may not necessarily translate into economic benefits for patients. For example, patients may experience increased costs if the journey distance to hospital is greater, equating to an increase in financial penalties, such as accessing transport or taking more time off work to access facilities further away. Bhattarai and McMeekin (2016) suggest that it is important to understand the trade-off between the quality of care and cost of centralisation, not only for the NHS budget but for individual patients. This concept can be termed 'economic burden'.

In the context of this literature review, the term 'economic burden' will be used to express financial costs experienced by patients when faced with reconfiguration of emergency care

services. This includes direct costs (e.g. travel expenses) and indirect costs (e.g. loss of income, childcare costs). The following section will summarise the research investigating the concept of 'economic burden'.

The concept of 'economic burden' for patients associated with health service reconfiguration has been investigated in the literature associated with behavioural economics. Clarke (1996) employed the Travel Cost Methodology (TCM) to appraise a programme to implement mobile mammographic screening units in rural areas of Australia. The TCM methodology involves collecting data on the costs incurred by individuals by travelling to and accessing a service or amenity. The TCM approach involves generating an 'access value' for the use of a commodity or service that is free at the point of access or 'zero-priced' medical care. The 'access value' is made up of factors such as travel time, money spent getting to the service or money spent whilst accessing a free service. Clarke (1996) assessed the relationship between an individual's 'access value' and the willingness to engage with mammographic screening. Data generated by Clarke (1996) suggested that benefits to the public were dependent upon a town's distance from the nearest fixed mammographic screening unit, for example people who lived more than 29km from the mammographic screening unit; found that the 'economic burden' of the travel costs and travel time outstripped the benefits of the screening service.

In a Japanese study, Ohshige et al (2004) also used TCM to explore patients' compliance with annual healthcare check-ups provided free of charge. The study aimed to evaluate the willingness of patients to pay for maintaining the health check programme. By collating data via means of a questionnaire, the study found the trade-off associated with the 'access' cost (money spent accessing the service) and the provision of the preventative healthcare services was deemed acceptable by the local population. However, this only accounted for the short term; the study found that members of the population were less likely to attend the health check programme in the future (long term) if they had to endure repeated 'access' costs.

Both studies utilise a robust methodology that has the potential to explore information about the relative importance of economic trade off; however such an economic methodology does not capture why one option is considered more desirable than another, which may be considered a weakness of such an approach. In addition, both papers where

located outside the UK therefore its questionable whether the findings are transferable to a UK context. This is because the NHS is free at the point of contact and does not necessitate health insurance or private billing. It is noteworthy that a significant amount of the studies discussing the financial implications of accessing the different types of emergency care services were predominately outside of the UK (Grant et al 2010, Siminski et al 2008, Masso et al 2007, Northington et al 2005). This literature review found few UK studies exploring the impact of financial factors (e.g. money spent on travel, money spent when engaging with service, money lost from taking time off work) upon choice of emergency care services.

A study focusing on service redesign associated with emergency care investigation examined factors influencing the way communities respond to proposals for major changes to local emergency services, including the economic trade-offs inherent in such decisions (e.g. distance travelled and costs) (Barratt et al 2015). The study used a cross-sectional approach, involving in-depth interviews of two groups of local residents. The first group involved individuals from a geographical area due to undergo reconfiguration of emergency services; the second group was made up of participants from an area with no plans for service modernisation. A thematic analysis of the interview data was conducted and found most participants were not willing to accommodate the economic trade-offs (e.g. extra travel time and costs) involved in centralisation of EDs to fewer sites. The paper concluded patient engagement and awareness campaigns regarding reconfiguration of emergency care services cannot assume that just providing a rationale and justification for the service design is sufficient, which perhaps challenges the assumption that communities can be persuaded to use a service by evidence alone. The study involves a relatively small sample size $n=28$; therefore, transferability of the study's findings is questionable. Although the results were informative the study could have benefited from exploring the influence of patient characteristics upon responses (e.g. demographic and socio-economic factors). This would have provided an additional level of knowledge, providing insight into how patient characteristics may influence preference and choice and even predict how patients will react to service reconfiguration.

On a review of the evidence, it became apparent that there is a proliferation of opinion and discussion papers relating to 'economic burden' and its association with health service reconfiguration. In an opinion paper regarding engaging the public early in service reconfiguration, Clarke and Rozansky (2013) claim one of the main community anxieties is

that of travelling further to access care and the associated costs. The authors suggest that it is easy to assume that trade-off between increased travel distances and costs would be acceptable to patients if they were to receive better quality and safer care. The paper continues by arguing that such an assumption cannot be made, and that service reconfiguration needs to implement additional analysis into how the 'economic burden' of individuals influences choice and preference of services involved in reconfiguration.

This review of the literature has also identified numerous discussion papers stressing the importance of acknowledging the implications of 'economic burden' on individual patients when centralising EDs (Clarke and Rozansky 2013, Barrett and Raine 2012, Independent Reconfiguration Panel 2010, Boyle and Steer 2008). In an opinion paper based on advising local government overview and scrutiny committees across Gloucestershire, Hertfordshire, Sussex and London, it is suggested that service reconfiguration should consider the impact of centralisation of services and the associated costs of accessing such services on the most disadvantaged community groups (Boyle and Steer 2008). This is also reflected by the Treasury's Green Book (HM Treasury 2003, p42) providing guidance for capital projects, which states: *'At some minimum appraisers should identify how the costs and benefits accrue to different groups in society'*. The views of HM Treasury are also supported by the document 'Ripping off the sticking plaster – Whole-system solutions for urgent and emergency care' (NHS Confederation 2014b). This report advocates that emergency care service reconfiguration is required to comprehend the rationale behind individuals' decisions and behaviour when choosing emergency care services, paying attention to how demographics and socio-economic characteristics influence preference.

It is notable that the discussion papers frequently use anecdotal evidence and commentary and lack the application of quality research to support related arguments. This suggests a lack of robust evidence available to justify discussion, informed opinion, and relevant recommendations.

This observation may indicate a gap in existing research base and suggests that primary research regarding health service reconfiguration may be lacking.

In summary, the literature review suggests a paucity of evidence exploring the theme of patient 'economic burden' and how this may affect how individuals perceive and engage with emergency care reconfiguration. The existing discourse regarding emergency care

reconfiguration, tends to examine or discuss the economic consequences on the NHS budget and not on of the patients engaging with the services.

The literature review has therefore highlighted a small body of literature attempting to acknowledge and measure patient 'economic burden' created by service reconfiguration. However, there has been limited research on how such a factor relates to reconfiguration of emergency care services, particularly minor injury services. Such a deficiency of investigation may threaten the successful implementation of emergency care reconfiguration resulting in patients accessing services in the wrong location. The factors associated with 'economic burden' and their relationship with patient choice of minor injury service requires further investigation and will be considered in this study. Such socio-economic variables include employment, salary (i.e. lost salary) travel costs and other attributable costs (e.g. childcare, refreshments).

2.7 Factors Influencing the Preference of Minor Injury Service

The previous discussion has established the importance of understanding how patients will interact with new services when faced with a reconfiguration, and what patient characteristics and other related factors may influence choice behaviour. However, the literature review has established that the paucity of evidence investigating such factors may influence patients' preference and choice of emergency care service when faced with a change of service, particularly in relation to the diversification of minor injury care to ENP led MIUs.

Considering the lack of research exploring how patient characteristics and external factors influence choice of minor injury care the literature review has now widened its scope, as highlighted in the search strategy (Section 2.2). The following sections will explore the literature investigating the use of emergency care with non-urgent conditions, a term that can be argued, encapsulates the spectrum of minor injury presentations. The literature review has highlighted a raft of patients characteristics or motivations that may influence the preference and choice behaviour when choosing an emergency care service for a non-urgent condition. The literature review will now discuss such factors which includes demographics, socio-economic characteristics, perceived seriousness of illness/injury, understanding the emergency care services, travel and transport. The following sections will explore such a suite of pertinent/relevant variables and their potential relationship with patients' choice of emergency care service for a non-urgent condition. This will subsequently

enable the study to determine which variables to investigate and capture in the data collection methodology. The discussion will commence by exploring existing evidence that investigates the influence of demographics on choice of emergency care service for a non-urgent complaint.

2.7.1 Demographic Factors

The following section will explore the existing literature regarding the influence of demographic characteristics upon the choice of emergency care service for a non-urgent condition.

2.7.1.1 Gender

The examination of gender and patient choice regarding emergency care service (e.g. ED, walk-in-centre, urgent care centre) for non-urgent conditions was limited. Only three studies were found exploring such a variable (Siminski et al 2008, Carett et al 2007, MacLean et al 1999).

Siminski et al (2008) explored the influence of gender and age on potential primary care attendances in EDs. The Australian study used administrative data from ED information system for 2005, (accounting for 76% of ED attendances in New South Wales) to explore the influence upon gender and age upon the reasons for attending ED with a non-urgent condition. The paper found no correlation between gender and emergency care preference. This was echoed by a quantitative study conducted by MacLean et al (1999) in a large US multicentred study.

However, the dearth of robust studies exploring the relationship between gender and choice of emergency care for non-urgent conditions including minor injuries requires future attention and exploration.

2.7.1.2 Age

Reviewing the literature, it was apparent there was a lack of robust exploration regarding the influence of age and on patient choice of emergency care service for a minor ailment. One of the few studies considering age, was a Brazilian study by Carett et al (2007), which examined the factors associated with inappropriate use of EDs. The study found that young patients were more likely to use ED for minor presentations. This is also reflected by a survey conducted by Citizens Advice (2014) which reveals that twice as many 18-34 year-

olds compared to over 65 s turned to an ED or walk-in-centre for a minor ailment when a GP appointment was unattainable.

In the paper by Gerard et al (2004) younger patients (less than 45 years) demonstrated greater preferences for being seen by a doctor in the emergency care system, in comparison to older patients who expressed an indifference about which health professional they saw. The authors suggested that such results could be utilised as a guide for framing local modernisation plans. The findings of Gerard et al (2004) are replicated by Williams and Khalid (2014) who found that young adults are the group with the highest rate of attendance at EDs for non-urgent presentations. Consequently, they identified younger adults as a key target group to reduce inappropriate attendance, enabling targeted behaviour change work.

In an Australian study exploring patients' perspectives on accessing ED services with non-urgent complaints, Unwin et al (2016) found that 15-24 year- olds were the most frequent presenters to ED with non-urgent conditions, especially musculoskeletal problems which included minor injury presentations. The study used a descriptive cross-sectional waiting room survey in an ED in a regional hospital and involved a significantly large sample (n=5283) of patients. The main weakness of the study involved the exclusion of some patient groups that required assistance with questionnaire completion, e.g. lack of English literacy skills. This is common in sampling strategies employed in ED due to the unavailability of clinical time/personnel to assist with questionnaire completion. However, it can be argued that this bias can result in sections of the population not being studied.

Grafstein et al (2013), in a Canadian paper, explored factors that influenced patient choices in selecting an ED for ambulatory care. This was the only study found to discuss the influence of waiting times on patients' preferences and choice of service. The study found that older people had a greater acceptance for longer waiting times, whilst younger people favoured shorter waiting times when deciding upon an emergency care facility. The research also found that patients with painful presenting complaints valued shorter waiting times, which was consistent across the age range.

Essentially, there is a relatively small amount of literature exploring age and patient choice of emergency care service for management of non-urgent conditions. However, the data available indicate that the younger age group appears to prefer the use of ED for the treatment of non-urgent condition presentations.

2.7.1.3 Ethnicity

The influence of ethnicity on the non-urgent use of emergency care services has been highlighted in the current literature. In a prospective US study, Brown et al (2011) examined the effect of socio-economic status, demographics and perceived health status on the choice of ED provision. Using a cross-sectional survey design, the authors found that African-Americans were more likely than white Americans to use ED services for non-urgent needs. A significant criticism of this study lies with the fact that only Caucasians and African-Americans were included in the study. The authors justify this approach by suggesting that it was difficult to survey other cultural groups due to underrepresentation in the ED. The study acknowledges this limitation and suggests that future study would need to collate data with other cultural groups.

Caution also needs to be applied to the relevance of such findings for the context of the UK, as the impact of health insurance status was found to be a contributing factor, a variable not applicable to the UK healthcare system. As the US healthcare system is delivered in relation to insurance status, it is important to acknowledge that African-Americans are more likely to be uninsured and consequently use ED care as a default when non-urgent healthcare is required (Forrest and Whelan 2000, Oster and Bindman 2003). As the NHS provides healthcare free at the point of contact, the same relationship between ethnicity and ED use may be questionable.

In the context of the UK there are mixed findings regarding the association between ethnicity and ED use. Several studies found that more white British patients accessed ED for non-urgent ailments (Baker et al 2011, Rajpar et al 2000, Hull et al 1998). However, Scantlebury et al (2015) found that black or British black patients were associated with higher ED attendances for non-urgent complaints. The variety in findings regarding ethnicity and emergency care choice is very dependent on local context. To appreciate the validity of the findings, it is necessary to reflect upon the local ethnicity profile of the local population. As local ethnicity profiles vary considerably both nationally and internationally generalisability; of the findings regarding the correlation of ethnicity and emergency care choice is problematic. On examination of the literature there was only one attempt to address the issue of generalisability, this involved conducting a pan UK cross-sectional study, which endeavoured to investigate how and when patients chose to access UK EDs. The research found that ethnicity was not a significant predictor of ED use (Cowling et al 2013).

In summary, the literature review has demonstrated little investigation into ethnicity and its influence on patient choice of emergency care service for the treatment of a non-urgent condition. The few studies endeavouring to explore the influence of ethnicity on choice of emergency care service identified how current study samples may not capture the views of ethnic groups due to local variation. Therefore, the current evidence base would benefit from increased focus and study of ethnic groups.

2.7.1.4 Socio-economic Factors

The review of the literature revealed a myriad of socio-economic factors that may influence patient choice of emergency care service for the treatment of a non-urgent presentation. The following section will discuss and appraise such evidence.

2.7.1.5 Level of Deprivation

The variable of deprivation has been found to be a significant predictor of emergency care choice for non-urgent conditions. Such a correlation is demonstrated by Hull et al (1998) who studied East London EDs and the factors influencing the attendance rate. They found that patients deemed deprived were more likely to seek ED services for non-urgent presentations. This finding was also reflected in a study by Shah and Cook (2005) who investigated socio-economic factors and their association with ED attendance and utilisation of the UK health advice line, NHS direct. Using data from the 2004-05 British General Household Survey, the study identified 20,421 participants (an annual survey of private households in the UK). Using logistic regression to analyse the findings, Shah and Cook (2005) attempted to ascertain what socio-economic determinates may be used to predict ED and NHS Direct use. The authors found that participants with high levels of deprivation were more likely to utilise ED for non-urgent ailments. The study partly attributed this finding to the higher levels of chronic illness frequently found in patients with a higher level of deprivation. Shah and Cook (2005), also found that unskilled manual workers, those living in rented accommodation, with low household income, whose households was in receipt of income support, those with lack of access to a car and those who were current smoker where more likely to access an ED for non-urgent conditions.

By using the British General Household survey, it can be argued that the results provided a robust representation of the general population. However, it can also be argued that such a data set relies on self-reported health service utilisation and therefore may result in recall bias, which may compromise the reliability of the results. The authors also identify that the

British General Household survey fails to distinguish the use of health services for others, including children. However, although the study may have limitations the large sample size and pan UK approach suggest a robust study in terms of potential generalisability of the findings.

The results found by Shah and Cook (2005) are also reflected by Carlisle et al (1998) who found that people with higher levels of deprivation and lower incomes were most likely to attend ED and be classified as non-urgent. Scantlebury et al (2015) has built on the findings of such studies and endeavoured to create a model of demographic or socio-economic variables that predicts ED attendance. The study conducted a cross-sectional analysis of ED attendances in England. The data set was constructed using data from the Health and Social Care Information Centre and population data from 2011. As with previous research, the study established that high levels of deprivation and long-term health conditions demonstrated an increase attendance at EDs, particularly for conditions that could have been successfully managed in a primary care or MIU setting. As the study used data from almost all general practices across England in 2011-2012, it can be argued that the findings were representative of the English population and as such provided sufficient power to identify true associations. It is notable that the study excluded patients who were not registered at a GP; it could be argued that this has the potential to create bias. The authors have also acknowledged that as with all cross-sectional observational studies, the associations observed can be used to create hypotheses but are unable to demonstrate causality.

Similar findings regarding deprivation have been replicated in relation to paediatric ED attendance. Beattie et al (2001) explored the association between deprivation levels, attendance rates and triage category of children attending a UK ED. The study found that not only were the attendance rates higher for deprived children, but there was a significant association between children who were triaged as non-urgent. Such findings are reflected in other studies exploring the socio-economic determinants of children who access ED. Such research demonstrated that higher levels of deprivation correlate with a higher utilisation of ED services, especially when the presentations are considered minor (Brown et al 2005, Beattie et al 2001).

In summary, the existing evidence suggests that social deprivation can be considered a significant variable used to predict attendance at ED, especially with a non-urgent condition,

such as minor illness or injury. However, there is a need to develop this knowledge further and specifically explore how level of deprivation influences the specific arena of minor injury service preference.

2.7.1.6 Marital Status

The review of the literature only found two papers exploring the impact of marital status on the use of emergency care services for a non-urgent condition (MacLean et al 1999). The first paper conducted by MacLean et al (1999) was a quantitative study exploring the population characteristics of those who seek healthcare in US EDs. The study known as 'The LUNAR project' was conducted using the principles of the 'illness behaviour framework' proposed by Mechanic (1962). According to Mechanic (1962), *'Illness behaviour describes the manner in which persons monitor their bodies, define and interpret their symptoms, take remedial actions and utilise the healthcare systems'*. Mechanic (1962) proposed that at least four viewpoints could be used to study illness behaviour: dispositional, acquisitional, patient perception/decision making and the influence of healthcare system factors.

The LUNAR project concentrated on the acquisitional perspective and the influence of healthcare systems. The acquisitional factors involved the variables of religion, ethnicity, symptom severity, gender, age and marital status. The health system factors involved the consideration of variables such as access to healthcare services, distance to service, and the type and availability of clinicians. A standardised protocol was used to collate retrospective data from 140 randomly selected patients from 89 EDs; the final sample involved 12,422 ED patients. The study found that 52% of patients sought ED care for non-urgent care, 40% for urgent care and 8% for emergency care. Children and younger adults accounted for the largest consumers of ED services for non-urgent care with the most frequent reasons for visits being fever, chest pain, abdominal pain, middle ear infection, and upper respiratory infection. Injured patients (59%) had a higher percentage of nonurgent visits compared with persons with illnesses (49%). Single (59%) or divorced patients (55%) were also found more likely to attend ED with nonurgent conditions. Although written from an American perspective and written two decades ago it can be considered a noteworthy study and considers the breadth of demographic and socio-economic factors that may influence patients' choice of emergency care services for the treatment of non-urgent conditions, including minor injuries.

The second paper was a Brazilian study by Carrett et al (2007) which found no significant statistical correlation between marital status and the use of ED for management of a non-urgent presentation. As this study was conducted in Brazil, the relevance to UK emergency care may be questionable.

2.7.1.7 Qualifications

Only two papers were found exploring the influence of education upon choice of emergency care service for a non-urgent condition. A Brazilian study conducted by Carett et al (2007) suggests that patients with a higher level of education are more likely to choose an ED for treatment of a non-urgent condition. Brown et al (2011) also investigated the influence of qualifications on the use of ED and found no correlation between the two variables.

2.7.1.8 Health Status

The work by Carret et al (2007) and Brown et al (2011) also account for papers found exploring current health status upon the choice of ED for a non-urgent condition. Carett et al (2017) found that patients with a self-reported chronic condition were more likely to prefer ED services for the assessment of a non-urgent condition, however as previously discussed application of such findings to the context of the UK requires caution. This is also found by Scantlebury et al (2015) who conducted a cross-sectional population-based survey in the UK; the study found the proportion of the population with a long-standing health condition was more likely to use ED for a non-urgent condition. In contrast, Brown et al (2011) found health status to be unrelated to ED attendance.

2.7.2 Other Factors

2.7.2.1 Understanding the Emergency Care System

The issue of sign-posting, and navigation of the emergency care system has been highlighted as a factor shaping patients' choice of service for the management of non-urgent conditions. Numerous studies have established that some patients were not aware of alternative services (e.g. GP surgeries, GP out of hours, walk-in-centres) or did not have any knowledge of the geographical location of such services (Coleman et al 2001, Jaarsma-Van Leeuwen et al 2000, Rajpar et al 2000). Rajpar et al (2000) attempted to determine the reasons for choosing primary care out of hours centres and ED for non-urgent conditions. The study used semi structured interviews with 102 patients attending ED (n=54) and a GP out of hours cooperative (n=48). The most noteworthy finding of this study was the fact that 94.4% (n=51) of the ED attenders did not know about the GP out of hours service. The study

could be criticised as having a relatively small sample size and located in an inner-city site with high levels of deprivation, thus limiting wider transferability. It is also questionable that the data collated from the GP out of hours service was applicable as the patients attending such a service had been screened by a telephone call to the GP prior to attendance, whereas the ED participants were considered 'self-presenters'.

O'Cathian et al (2008), in a qualitative study exploring perceptions and preferences regarding emergency care, found that patients frequently expressed confusion concerning the range of choices on offer, e.g. primary care, ED, walk-in-centres. The participants articulated the need to understand how the system worked, including when, where and how they should enter the system. This is reflected by one focus group respondent who articulated the confusion in relation to the function of an MIU:

'From my point of view, from an adult side of things [since the local hospital] lost its A&E it seems there is a lot more different services like minor injuries, GP cooperative. I am never sure what covers what....If you broke your wrist can you go to minor injuries or do you need to trek all the way to A&E particularly from [the local hospital where minor injuries is situated]? I am not too sure what covers what.....I went to minor injuries and needed the A&E. I could have gone there in the first place. It's knowing what they cover at the [local hospital]' (p. 21).

The work of O'Cathian et al (2008) appears to be the only study exploring patients' perceptions of minor injury units, particularly in relation to understanding what the service delivers. This paucity of evidence is pertinent and suggests a significant gap in current knowledge and necessitates the need to investigate patients' choice in relation to minor injury services and the variables associated with choices.

Coster et al (2017) conducted a systematic review of the reasons why people choose or prefer to access emergency and urgent care services. This comprehensive review presented a catalogue of frequently occurring themes influencing patients' decisions on where and when to access emergency care. The review found that confidence in primary care and access to primary care appointments was a major influence on why patients chose to access emergency care for non-urgent conditions. Several reasons for this behaviour were reported; one of the most frequently stated motives was the anticipated lengthy wait for a GP appointment, with many patients expressing frustration with having to wait for a consultation. The review also suggests that the concept of accessibility and convenience of primary care appointments was also a contributing variable in the use of ED for non-urgent conditions. Patients also expressed dissatisfaction with the limited opening times of GP

practices resulting in limited choice. The systematic review only identified one study suggesting lack of patient knowledge about alternative services e.g. primary care services (Nelson 2011). Nelson (2011) conducted a survey amongst patients presenting to a rural Scottish ED asking why they had presented to an ED for a non-urgent condition. The paper found that patients frequently stated that they didn't understand how to access primary care services, particularly out of hours and consequently sought the help of ED.

Gerard et al (2004) found that the strongest elicited preference by patients using an emergency care system was being able to access a doctor rather than an alternative healthcare professional. The study found initiatives that use, or aim to use, an alternative workforce (such as ENPs) may be less acceptable to patients. Gerard et al (2004) note that if this is the case, then the introduction of non-doctor lead services needs careful consideration and planning. Service commissioners need to acknowledge that some patients may be suspicious of their effectiveness or unfamiliar with their functions and that any reconfiguration strategy needs to embrace this notion. Such observations are given limited attention in the current literature and there is subsequently a need to explore the relationship between patient preference of emergency care services and which healthcare professional will deliver the service.

2.7.2.2 Perceived Seriousness of Illness/Injury

There is convincing evidence to suggest that despite non-urgent patients being aware of services specialising in the treatment and management of low acuity conditions, some may still opt for ED care, as they believe such hospital services deliver enhanced care. Numerous studies suggest that some patients prefer ED over other emergency care amenities as they believe that accuracy of diagnosis, access to diagnostics and senior doctors is superior (Fieldstone et al 2012, Nelson 2011, Moll van Charante et al 2007, Coleman et al 2001). Some studies learnt that a number of patients felt that their condition was too complex to be managed outside the realms of ED (Agarwal et al 2012, Penson 2012, Redstone 2008, Masso 2007). Lobachova et al (2014) echo such findings by establishing that 61% (n=364) of surveyed participants felt too unwell to be treated anywhere else except for ED.

Other studies investigating the characteristics of non-urgent emergency care patients have established that some participants felt reassured by seeking the services of ED rather than alternative facilities and services (Agarwal et al 2012, Afilalo et al 2004). Becker et al (2012) found that 24% of patients surveyed believed that hospital treatment is superior compared

with other emergency care services; this is also reflected by Muller et al (2012) who found that 39% of participants stated that they had more confidence in hospital services compared with alternative emergency care services. O’Cathain et al (2008) argue that some patients within an emergency care system found it uncomfortable, justifying the need for an urgent GP appointment and consequently avoided this by traveling to what they perceived to be a more accommodating, absorbent ED service, where they were guaranteed to see a doctor or nurse on the same day.

Gerard et al (2004) found that the strongest elicited preference by patients using an emergency care system was being able to access a doctor, rather than an alternative healthcare professional. The study found initiatives that use or aim to use an alternative workforce (such as ENPs) may be less acceptable to patients. Gerard et al (2004) note that if this is the case then the introduction of non-doctor led services needs careful consideration and planning. Service commissioners need to acknowledge that some patients may be suspicious of their effectiveness or unfamiliar with their functions and that any reconfiguration strategy needs to embrace this notion. Such observations are given limited attention in the current literature and there is subsequently a need to explore the relationship between patient preference of emergency care services and which healthcare professionals will deliver the service.

There is a suggestion that many people see themselves as ‘sensible’ users of emergency care services (Craker 2014) which conflicts with a body of research suggesting that patients use emergency care services inappropriately (Cowling et al 2013, Becker et al 2012, Fieldstone 2012, Brown et al 2011, Coleman et al 2001). This is echoed in a discrete choice experiment study which explored the influences of choices and how such data could inform a persuasive communications campaign to reduce non-urgent ED attendance (Craker 2014). The study found that many participants’ prudent thinking prior to deciding upon emergency care access failed to acknowledge they may have benefited from accessing alternative services such as ENP led MIUs, pharmacies or opticians. This is also reflected by Kraaijvanger et al (2016) in a systematic review exploring the motives for self-referral to ED. The review found two of the most common themes from the literature involved the disconnect between what patients perceived to be the urgency or severity of their condition and the actual clinically assessed urgency.

2.7.2.3 Travel and Transport

The convenience of location and associated travel distance, time and associated costs have been acknowledged by the existing literature as influencing variables in the use of ED for non-urgent ailments. A body of research suggests that if travel time, distance and cost are deemed excessive when accessing non-urgent services (e.g. primary care, walk-in centres, MIUs) many patients prefer to choose ED consultation (Cowling et al 2013, Baker et al 2011, Gill and Riley 1996, McKee et al 1990), a pattern of ED utilisation and preference termed as 'distance decay' by Mungall (2005). In contrast other studies have found that travel time, distance and the related costs have not contributed to patient's preference or choice when accessing healthcare for non-urgent conditions and there is no correlation with such variables (Hendry et al 2005, Carlisle et al 1998).

Intrinsically linked with travel considerations is the issue of access to available transport and this relationship has been discussed in numerous studies. Such research has demonstrated that patients with limited access to a private car tend to prefer the use of ED services for non-urgent conditions, rather than accessing alternative services with associated longer travel times, more complex journeys and perceived costs associated with the use of public transport (Wilkin et al 2012, Shaw et al 2013, Toloo et al 2013).

In a Canadian study using a cross-sectional face-to-face survey across six EDs in Vancouver, Grafstein et al (2013) found that given a choice of local EDs 44% (n=279) of the 634 participants stated that proximity of an ED to their home was the most important factor in influencing their preference and choice. This finding was significant especially when considering that fewer than 10% of participants stated perceived quality of care as the most important factor and 9.3 % stated that waiting times was the determining factor in choosing an ED service. Grafstein et al (2013) claims that this finding suggests that patients value time to care more than the quality of care and that this trade off was deemed acceptable.

In summary, there is a sizeable body of evidence that demonstrates how patients value the convenience of service location. The evidence suggests if a service is deemed closer to home or has better transport connections (e.g. ED) then patients will tend to utilise such services for non-urgent conditions, rather than seeking the help of alternative urgent care services (e.g. primary care, walk-in-centres, MIUs) which may be geographically further away from the patient's home.

2.8 Conceptualising the Findings of the Literature Review

It was evident from the literature view that reconfiguration of emergency care services can take on differing models, which may involve the centralisation and diversification of services away from the ED; this includes the establishment of ENP led MIUs geographically separate from the traditional ED. The review suggested planning and commissioning of emergency care services is not a linear process and can produce a complex mesh of interacting parts. Exploration of the literature also revealed a significant number of variables with the ability to influence choice of emergency care services for non-urgent conditions (including minor injury), which in turn would influence the success of emergency care reconfiguration. Due to the literature review identifying such a complex interplay of evidence, complexity theory (Wilson 2009, Rouse 2007) was deemed a suitable lens to conceptualise findings of the literature review and assist with the selection of variables regarded suitable for investigation in the planned study.

Prior to using complexity theory to conceptualise the literature search findings and establish variables of interest, it is worth appreciating some pertinent concepts associated with the paradigm of complexity theory and how it applies to exploring the literature review.

Complexity theory is guided by numerous disciplines including physics, mathematics, biology, ecology and computer science and has recently been used to investigate healthcare issues (Wilson 2009). The theory generates concepts based upon relationships, emergence, patterns and interactions enabling the study of complex systems (Anaf et al 2007).

Engbreton and Hickey in Butts and Rich (2011) advocate that complexity theory draws upon a catalogue of ideas and emerging concepts that together provide a lens to explore complex systems.

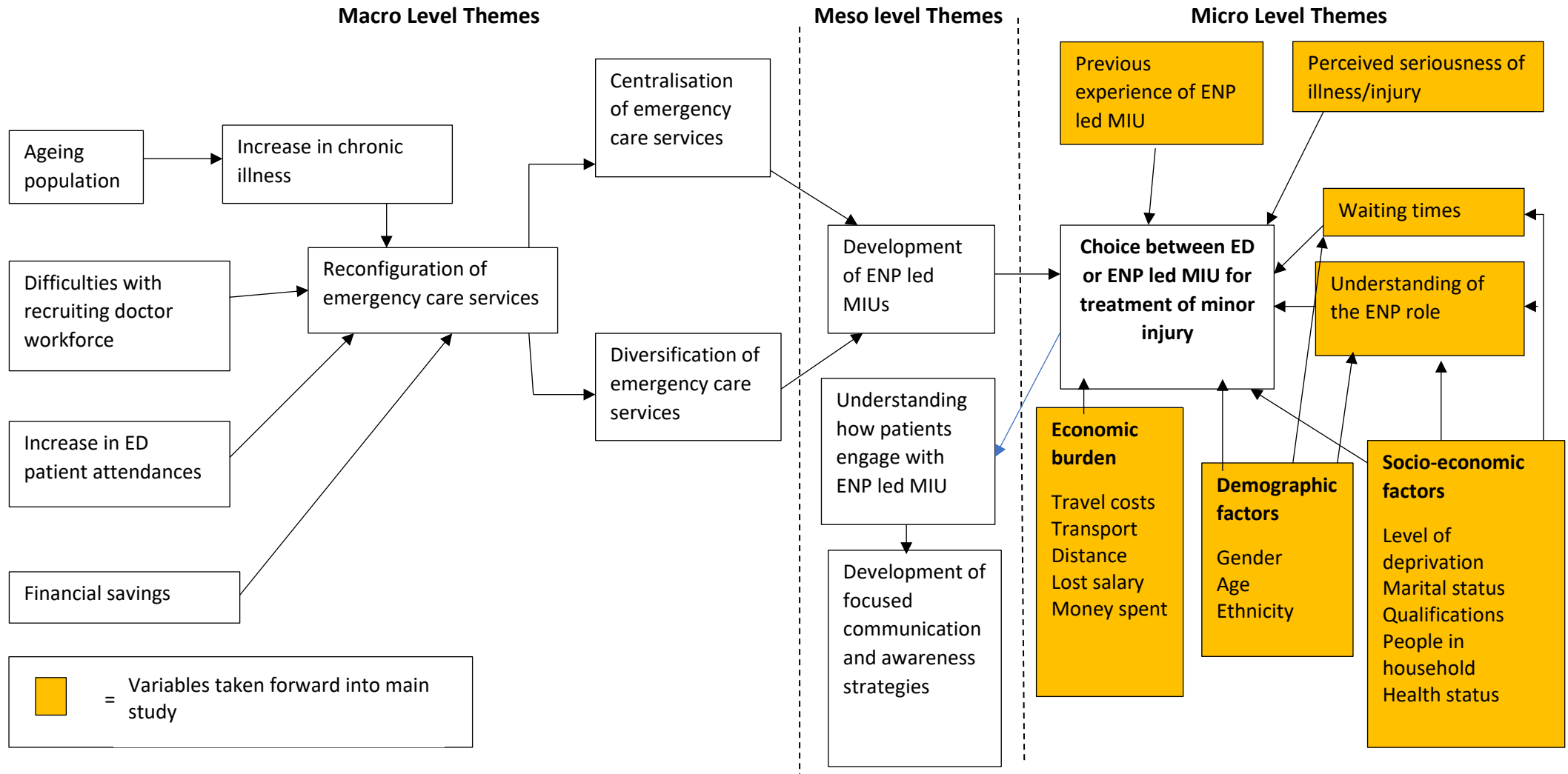
Complexity theory acknowledges all levels of a system and how the levels interact. The concepts of macro, meso and micro level are frequently used by complexity theory literature to map out the interconnected agents involved in the problem or subject under scrutiny (Strumberg et al 2012). In this context, macro level may involve the consideration of policy, political, economic or societal triggers for a particular phenomenon (e.g. ageing population, financial pressures). Meso level involves taking the triggers expressed at a macro level and applying them at a local community or organisation level (e.g. reconfiguration of local healthcare services). Finally, the micro level can be considered the study of individuals in

their social setting and how they interact with the system (e.g. individual patients and how they engage and choose new emergency care services) (Strumberg et al 2012).

Complexity theory has been successfully applied to exploration of new healthcare initiatives and services (Hannigan 2013, Tenbensen 2013, Trenholm and Ferlie 2013). Resonating with the context of this study, complexity theory has been recently been applied to understanding health service reforms. Such studies use complexity theory as a means of unpacking and exploring the interconnected factors that influence the way in which patients and the system react to reconfiguration of services (Strumberg et al 2012, Paina and Peters 2011, De Savigny and Adam 2009, Rouse 2007). The complexity theory perspective acknowledges the significance of inter-relationship and provides an alternative framework to investigate a multifaceted problem or question (Wilson 2009). Holland (2014) concurs and argues complexity theory directs researchers to search for patterns of interactions within agents, between agents and the environment to rationalise system outcomes. Considering such principles of complexity theory, it is a fitting framework through which to unpick the findings of the literature review and identify the variables that may influence a patient's preference of minor injury service. The review of evidence has chronicled a significant number of elements that play a part in healthcare reconfiguration, particularly that of emergency care redesign and the factors and characteristics that influence patient preference when services are redesigned. Articulating such elements requires a framework that can explore evidence with greater emphasis on context and produces more profound inquiry that listens to all levels of the system (Wilson 2009), and it can therefore be argued that the framework of complexity theory can meet such requirements.

The complexity theory framework has enabled the generation of Fig 2.3 which summarises the macro, meso and micro level themes emerging from the literature review. The summary also identifies the variables generated by the evidence scope which may influence the preference of minor injury service. It is the intention of this study to take such independent variables forward into the main study.

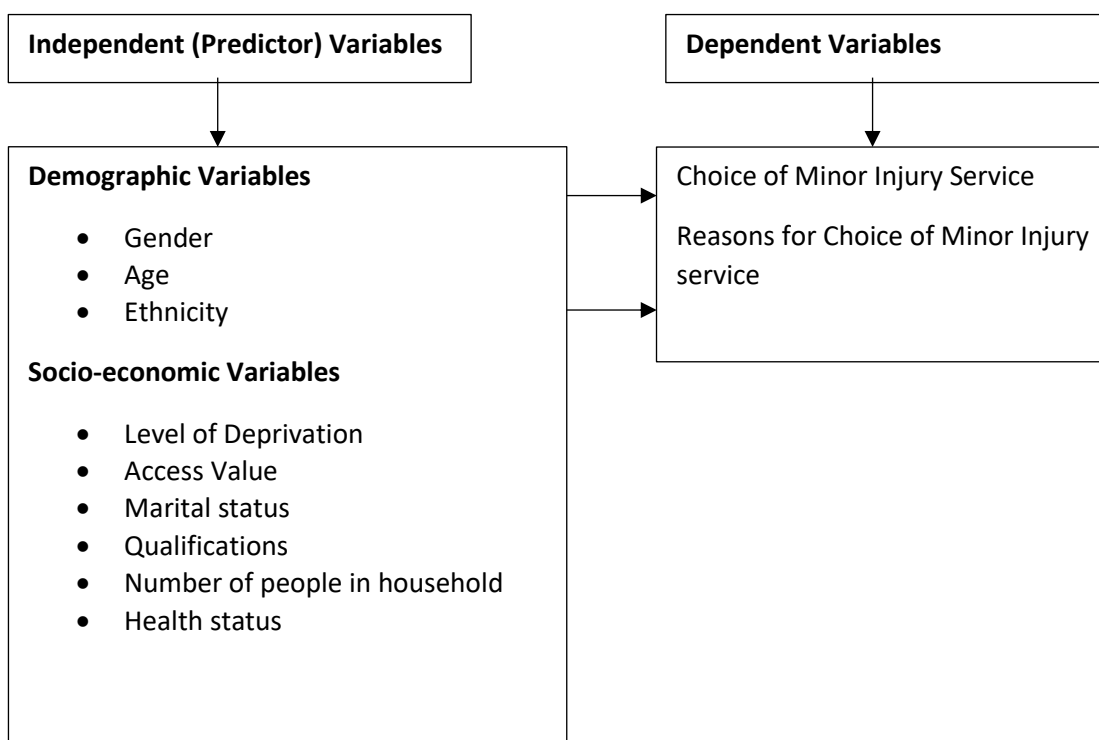
Fig 2.3 A Summary of the Literature Review Findings: Emergency Care Service Reconfiguration and the Effects Upon Minor Injury Services



2.9 Variables

The previous narrative has reviewed the literature exploring emergency care reconfiguration and patients' choices in relation to minor injury services. After reviewing the evidence and conceptualising the findings the study has now identified a suite of independent (predictor) and dependent variables (a variable that is being studied for its effect upon the independent variable) that require further investigation. Fig 2.4 summarises the independent and dependent variables.

Fig 2.4 Independent and Dependent Variables



2.10 Discussion of Updated Literature

The updated literature search found an Irish paper which described a series of studies exploring the impact of reconfiguration on Emergency and Urgent Care Networks (SIREN) (Brown 2020). The paper summarises the main findings of the mixed-methods research activity, which produced nine peer-reviewed publications. SIREN found that reconfiguration of emergency care services via centralisation was frequently justified by claims of improved patient safety and efficiency (e.g. mortality rates). Brown (2020) found that such claims are questionable and with SIREN finding little evidence to support such a notion. In fact, SIREN had generated evidence to suggest that centralisation of EDs to less sites had resulted in more overcrowding and capacity issues. This paper

illustrated a comprehensive collection of research activity that endeavoured to seek the views and preferences of a wide range of stakeholders (e.g. patients, managers and clinicians) regarding the emergency care reconfiguration. It was notable that the paper translated the findings of SIREN into tangible policy recommendations, which gave credence to the value of such research. Such recommendations included the need to listen to the argument for and against centralisation of EDs, and from all stakeholder perspectives.

The updated literature search yielded a second paper exploring reconfiguration of health care services (Stewart et al 2020). This qualitative study compares policy and practice for involving the public in major health service reconfiguration across the UK's four health systems (Wales, England, Scotland and Ireland). The study analysed policy documents and interviewed a range of reconfiguration stakeholders (n=47) including managers, NHS staff and public campaigners. The study concluded that reconfiguration policy has used 'sticks' and 'sermons' to convince the public that reconfiguration is required. The paper suggests that health service redesign tends to give 'lip service' to patient and public engagement with service redesign.

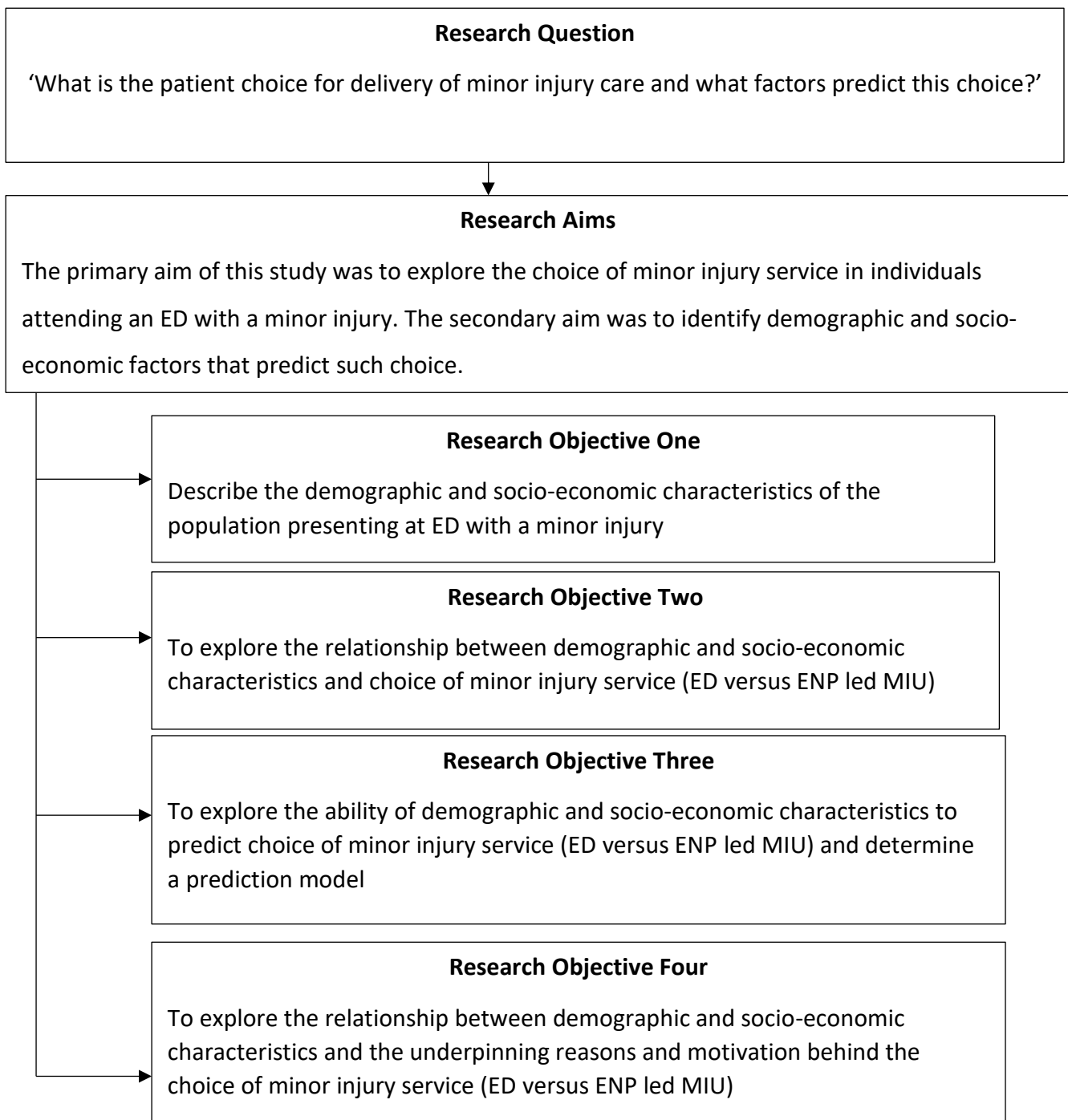
It is noteworthy that both new papers mention the importance of co-production of healthcare reconfiguration, however, both papers note that both policy and practice fail to convert such recommendations into tangible action. Both papers conclude that more must be done to ensure that the involvement of patients in service change. However, neither paper mentions the co-production of any awareness and communication strategies and the possible impact of such an approach on the success of service redesign.

The updated research has not generated any significant evidence that would have changed any of the variables used within the original study. Considering the new evidence the following research question, aims and objectives remain unchanged.

2.11 Research Question, Aims and Objectives`

Having established the gaps in the knowledge and the variables that require further investigation the subsequent section will set out the research aims, objectives and overriding research question, these are outlined in fig 2.5.

Fig 2.5 Summary of Research Question, Aims and Objectives



2.12 Chapter Summary

This review recognised a paucity of literature exploring patient choice of minor injury services. Therefore, the review widened the search to explore the factors that influence patients' choice of emergency care service when seeking treatment for a minor ailment (such as a minor injury). The appraisal of existing evidence found that there was a lack of robust and compelling research that explored the choices of patients prior to the reconfiguration of emergency care services.

Although policy and guidelines recommend a robust understanding of how the community and patients may behave towards a redesign in service provision, there is little evidence that this is translated into research. The existing evidence tends to investigate the views and choices of patients after the reconfiguration has been implemented, which may generate unexpected reactions and behaviours. It can be argued that there is a need to predict how patients will engage and use services before the implementation of change, thereby identifying potential patterns of service use and providing a focus and target for communication and engagement activities.

It can be argued that to predict how patients will choose minor injury services in future reconfiguration (ED versus ENP led MIU), there is a need to investigate variables that may relate to patient choice behaviour. However, there is a paucity of literature exploring patient characteristics that may influence choice when selecting an emergency care service for the treatment of a minor injury. When expanding the literature search to include studies investigating patients' choice of emergency care for non-urgent conditions, it was found that patient characteristics could potentially relate to the choice of service (e.g. ED, primary care, out of hours primary care). Such characteristics included demographics (gender, age, ethnicity) and socio-economic factors (deprivation, marital status, qualifications, health status). It was also noteworthy that the literature had paid no attention to other factors such as people in the household and salary. The literature review also found factors associated with 'economic burden' (travel costs and convenience, lost salary) had the potential to forecast patient choice regarding engagement with new healthcare services.

Although the literature review has identified a body of research exploring the factors that may influence choice of emergency care service for a non-urgent condition (such as a minor injury) it is evident that the existing literature tends to lack exploration of the reasons behind the such choice behaviour. Consequently, the evidence review has highlighted the need to generate further knowledge regarding the reasons and rationale behind patient choice of minor injury service.

This chapter has critically appraised the existing evidence pertinent to the reconfiguration of emergency care services and what factors may influence the choice of minor injury services. Using complexity theory, the chapter has conceptualised the findings of the literature search. As a result, the chapter has enabled the identification of a suite of demographic and socio-economic variables that may influence and predict patient choice of minor injury service (ED versus ENP led MIU). The following methodology chapter will describe how the study design facilitated the investigation of such variables.

Chapter 3 Methodology

3.1 Introduction

The chapter will begin by outlining the study design. The setting of the study will then be described and how the study participants were selected according to pre-set inclusion and exclusion criteria. The approach to participant recruitment will be defined and discussed alongside how the data were collected and how the sample size was specified and justified. The chapter will continue by recounting how the data collection tool was designed to capture data pertinent to the variables under scrutiny. The concept of bias and rigour will be discussed and how the findings of a pilot study led to modification of the survey tool and the study protocol. The chapter will then discuss the ethical and governance implications of the study and how such issues were addressed, particularly focusing on the issues of consent, confidentiality, anonymity and the potential burdens/risks to both participants and ED nursing staff. Finally, the issue of data processing and analysis will be discussed including how the generated data were managed and what statistical techniques were used.

3.2 Study Design

Having established the overriding research question and associated aims and objectives, the study design was then developed and implemented. The research used an observational study design, specifically that of a cross-sectional survey. A cross-sectional methodological approach can be used to describe the frequency of a specific attribute in a stated population or sample of a population in a given point of time and is a type of observational study design. Such a design involves collating data at a fixed point in time, thus generating a 'snap shot' of the experience of a population (Bowling and Ebrahim 2010). A cross-sectional design collates a body of data with two or more variables, which are then analysed to establish any patterns of association (Bryman 2008). Such a defining feature and benefit of a cross-sectional design enables the researcher to compare and analyse many different variables at the same time, which is pertinent to this study, as it explores a complex inter play of socio-economic, demographic and choice variables. The other advantage of a cross-sectional approach is the ability to collate a high volume of a data from a large pool of potential participants, within a relatively small time period and without generating high financial costs. This is significant to this doctoral study as it was not funded (Bowling and Ebrahim 2010).

One of the main criticisms of cross-sectional studies is the inability to determine causal relationships. However, it can be argued that such research provides focused evidence to justify further exploration of 'cause and effect' amongst variables. Several authors have criticised observational research, such as cross-sectional design, as lacking a robust approach to reporting its research process and findings. Such critique suggests that such dearth of detail does not enable a thorough assessment of the strengths and weaknesses of the investigation (Pocock et al 2004). Such criticisms have been acknowledged by a group of methodologists, researchers and editors who, in response have developed the 'Strengthening the Reporting of Observational Studies in Epidemiology' (STROBE) recommendations. Such guidance provides a checklist of items guiding the researcher in terms of with the structure and content of a cross-sectional study (Vandenbroucke et al 2007). To ensure a robust structure to the study design the STROBE checklist was utilised (Appendix 3).

3.3 Setting

The study was set in Aneurin Bevan University Health Board (ABUHB) and collected and analysed data from patients attending the ED of the Royal Gwent Hospital (RGH) in the Welsh city of Newport. ABUHB covers the areas of Blaenau Gwent, Caerphilly, Monmouthshire, Newport, Torfaen and South Powys, providing healthcare for a population of 640,000.

This ABUHB setting was selected because of its involvement in future reconfiguration plans, involving the centralisation of acute emergencies (e.g. stroke, cardiac, trauma) to a newly built critical care hospital (Grange University Hospital). The existing RGH ED will become an ENP led MIU providing a minor injury service only. As the RGH ED is going to experience a transition in terms of emergency care services, the research setting was deemed appropriate to collect data regarding the choice behaviour of patients at a point in time before the implementation of service reconfiguration. This prospective data could therefore be utilised to further inform a robust patient engagement and communication strategy within the RGH patient catchment area.

3.4 Recruitment of Participants

The participants were recruited between May 2016 and March 2017. To distribute the questionnaire, prospective participants were purposively recruited into the study using the inclusion and exclusion criteria summarised in Tables 3.0 and 3.1. This purposive sampling approach involved a deliberate choice of participant who would provide information about the phenomenon in question, that being choice of minor injury service (ED versus ENP led MIU). The purposive

recruitment involved seeking out the patients that presented with a minor injury/illness and lived in the local catchment area due to undergo emergency care reconfiguration. Purposive recruitment was chosen over convenience recruitment which would have excluded any inclusion or exclusion criteria and would have threatened the generalisability of the study findings (Bowling and Ebrahim 2010).

Table 3.0 Participant Exclusion Criteria

Inclusion Criteria
All patients aged 18 years and over (no upper limit)
Patients that live within the catchment area of the local ED
Patients self-presenting to the ED MIU Department and assessed as appropriate to sit in the minor injury waiting room by the triage nurse.
Patients with a pain score less than 8 out of 10.

It was decided that the lower age limit (18 years) would be implemented as the study was focused upon autonomous preferences of patients regarding use of a minor injury service and the underlying rationale. That is, if a younger age group were included their responses could be influenced by parental choice resulting in contamination of the findings. As the research question focused on the ability to predict preference of minor injury service (between a traditional ED and ENP led MIU), it was deemed appropriate to survey the preferences of patients due to undergo a local change in minor injury provision. This justified the decision to collect data from patients within a catchment area due to undertake a reconfiguration of emergency services (including MIUs) thus enabling an understanding and appreciation of views and preferences prior to a change in service delivery.

Table 3.2 Participant Exclusion Criteria

Exclusion Criteria
Patients under 18 years old
Patients unable to provide informed consent
Patients redirected or signposted to other healthcare services e.g. primary care, pharmacy
Patients that live outside the ED catchment area
Patients brought to ED via ambulance
Patients transferred to the majors/resuscitation area of ED (as assessed by the triage nurse)
Patients with a pain score of greater than 8 out of 10.

Patients suffering from psychological distress or undue stress.

Patients who were unable to read or write English or Welsh.

Patients who were unable to complete the questionnaire without assistance.

Patients transferred to the majors and resuscitation area of an ED will have presented with conditions not deemed a minor illness or injury (e.g. chest pain, shortness of breath, stroke, fits). Therefore, it was deemed inappropriate to compound the distress of such patients by requesting questionnaire completion.

It was acknowledged that research in ED can be fraught with difficulties due to the danger of increasing patient burden and distress during what can be stressful contact with healthcare services (Murphy and Nightingale 2002). Compounding patients' distress both physically and psychologically is deemed unethical; therefore the exclusion criteria encompassed patients in severe pain (pain score > 8 out of 10) and patients suffering from obvious or potential distress/stress (e.g. threatened, miscarriage, safeguarding issues). Such patients were excluded at the discretion of the triage nurse distributing the questionnaires. Ethically it was important to ensure clinical priorities took precedence over the recruitment of participants and patients were not unduly burdened if they were clinically unwell.

The study excluded patients unable to read and write English or Welsh and/or required assistance with completion of the questionnaire as such individuals would require assistance from the triage nurse which would increase the workload of such an individual.

The triage nurses involved in the recruitment process received prior training and instruction from the primary researcher. The training and instruction involved outlining the purpose of the research and how the data collection strategy was to be achieved. As the triage nurses worked alongside the primary researcher in clinical practice, access to ongoing advice and assistance was maximised. Such proximity to the primary researcher also enabled the data collection team the ability to highlight any potential or actual operational issues.

Initially it was proposed that the sample would be recruited by means of a postal self-administered questionnaire. However, this approach was rejected as it is recognised that postal surveys conducted in ED typically have poor return rates (Curtis and Redmond 2009). Consequently, it was acknowledged that continuing with postal survey using a purposive sampling approach would have been financially costly and taken considerable time which was not appropriate for a non-funded

doctoral study. Subsequently, it was thought that dispersal and completion of the questionnaire whilst patients were booked into the ED would be more effective, efficient and economically viable. This decision was supported by existing emergency care research supporting the notion that dispersal of questionnaires necessitating completion before discharge or transfer improved response rates (Byrne et al 2000). Naturally, this would only be acceptable if the distribution of the questionnaire was safe and it was appropriate to distribute it.

Recruitment of prospective patients was conducted by the ED triage nurses whose role involved conducting the initial ED patient assessment. The purposive sampling approach by the triage nurses identified prospective participants by utilising two sources of data. The first data source involved the computer software operated across local EDs and MIUs. The patient management software registers patients and manages the information generated by their emergency care attendance, including presenting complaint and location within ED. The system also collates demographic information (e.g. age, gender, address). As a result, such information was used to establish the eligibility of the patient to become a participant in the study. Once prospective participants had been identified from the computer software, the triage nurse progressed onto gathering information from the second source of data, the triage assessment. This source of data enabled the triage nurses to address the outstanding inclusion and exclusion criteria such as clinical presentation, level of distress/stress, pain score, literacy or language barriers. Once the triage nurses had identified patients meeting the inclusion criteria for recruitment (Table 3.0), patients were then approached for possible involvement in the study. At this juncture the patients were given the opportunity to complete the questionnaire or opt out of the process.

If the patient agreed to participate the triage nurse distributed a recruitment pack containing participant information sheet (Appendix 1), questionnaire (Appendix 2) and a pen. The participants were then directed to the ED waiting room where they were able to complete the document (also available in Welsh). The triage nurse then advised participants to post the completed questionnaire into a locked post box erected on the wall of the ED waiting room. The questionnaires were collected from the post box every 2-3 days by the primary researcher.

As a purposive sampling strategy was implemented, this necessitated the consideration of potential coercion. The patients in the ED waiting room could be perceived as a 'captive audience', resulting in the patients feeling coerced into completing the questionnaire. The triage nurse compensated for such a threat and clearly articulated participation was voluntary and would not have any impact

upon care outcomes. The provision of a post box provided in the waiting room ensured participants did not feel pressurised to complete the survey or feel uncomfortable if they decided to withdraw from the study.

To maintain rigour during the data collection period, the author conducted weekly field work sessions. During this field work the author worked alongside the triage nurses assisting with the recruitment of potential participants enabling identification and solutions to any potential data collection issues and concerns.

3.5 Sample Size

One of the assumptions associated with logistic regression concerns the number of cases (n) in the sample and the number of potential predictor (independent) variables that may be included in the predictor model (Pallant 2013). The following calculation articulates the minimum sample size required for logistic regression (Sage 2017):

Each continuous variable n=10 + Each categorical variable n= (number of categories -1) x10

Considering the possibility that all variables could be taken forward into the logistic regression analysis Table 3.2 tabulates the results of the sample size calculations. The results indicated the minimum sample size would be n=480. The sample size of the study was n=500; therefore it can be argued such a result meets the assumptions of logistic regression.

When deciding upon the details of the sampling strategy, it was important to consider the intended approach to statistical analysis. As the study intended to explore which factors predict choice of minor injury service, logistic regression was used to explore the data. When considering the technique of logistic regression analysis, it was paramount to ascertain whether the study had a large enough sample to provide sufficient data to fit the predictor model (Bertgold et al 2017, Pallant 2013). Although there has been little work regarding the role of sample size in the utilisation of logistic regression (Hosmer and Lemeshow 2000), the existing literature suggests a small or moderate sample size with a large number of predictors may create issues with analysis, such as biased odds ratio, where odds ratios are overestimated (Pallant 2015, Nemes et al (2009). After reviewing the small body of literature regarding sample size in logistic regression the sample size was calculated using the work of Concato et al (1995) and Peduzzi et al (1996). Such work recommends the concept of event per variable (EPV); for logistic regression the EPV should be n=10. The concept of EPV being n=10 has received some criticism (Austin and Steyerberg 2017,

Maarten et al 2016); however a body of literature has been more approving of EPV being n=10 (Bujang 2018, Nemes et al 2009, Long 1997) and subsequently recommends observational studies involving logistic regression analysis require a sample size of n=500 or greater to achieve statistics representative of the targeted population. Reflecting upon such recommendations, the decision for the study to collect n=500 questionnaires via purposive sampling was deemed an appropriate target.

Table 3.2 Assessment of the Possible Predictor (Independent) Variables to Determine Minimum Sample Size

Variable	Type	Categorical (Categories -1) x10	Continuous 10
Gender	Categorical	10	
Age	Continuous		10
Ethnicity	Categorical	60	
Level of deprivation	Continuous		10
Access value	Continuous		10
Marital status	Categorical	80	
Qualification	Categorical	90	
People in household	Continuous/discrete		10
Health status	Categorical	40	
Mobility		40	
Self-care		40	
Usual care		40	
Pain and discomfort		40	
Anxiety and depression			
Total/cases required = 480		440	40

As well as the theoretical justification of the sample size it was necessary to consider the practicalities of collecting 500 questionnaires over six months within the ED. Attendance data indicated that access to 500 participants over six months was realistic and achievable as the ED unit under scrutiny saw an average of 84,000 patients per year, with an average of 110 patients self-presenting to ED daily.

3.6 Development of Data Collection Tool

To explore patient choice of minor injury service (ED versus ENP led MIU) and how demographic and socio-economic factors predict such a preference, the data were collected via a self-administered questionnaire (Appendix 2). Prior to the design of the questionnaire it was necessary to recognise the context of the study. The questionnaire design acknowledged that UK emergency care is a service free at the point of contact and does not require exchange of money or insurance

before access is permitted. Put in economic terms, UK EDs provide a service that can be considered a 'non-market' commodity (Kragt 2009) which does not have an attributed monetary value for the patients using the service (Lynch 2014). The questionnaire design also acknowledged the principle aim of the research which involved exploring the choice of minor injury service (ED versus ENP led MIU) and the secondary aim of what demographic and socio-economic factors influenced such choice.

Considering such a context and research aims, the questionnaire design was influenced by the principles found in non-market valuation research methods, an approach used frequently in recreational and economic literature (Lynch 2014). Non-market valuation methods are concerned with measuring an 'access value' of a commodity that may not take on a material form or that may have no financial value. Examples of a non-material commodity can be found in a facility or a service, which resonates with the context of this study. Such commodities are more concerned with ascertaining benefits to people rather than generating a potential monetary value (Morgan 2008, Alberini and Longo 2005, Mathis 2003). Reflecting upon such methods it was deemed that elements of such approaches could be suitable for developing a survey tool to collate data regarding the delivery of a UK minor injury service which is free at the point of contact and therefore considered a non-material commodity.

Two domains of economics paying heed to non-market valuation are environmental and behavioural economics. Such branches of economics extensively implement non-market valuation methodologies to predict behaviour and choice by exploring individual's preferences and perceived benefits gained (Lynch 2014). Non-market commodities studied in environmental and behavioural economic literature include air and water quality (Kragt et al 2009, Poor and Breece 2007) recreational facilities (Simones et al 2013, Rolfe and Dyack 2011, Grossman 2011) and healthcare services (Clarke 2002, Clarke 1996) reflecting the context of this study.

The literature denotes two main methodological approaches to non-market valuation. The first approach involves the generation of a hypothetical market situation. This hypothetical scenario is presented to a participant whereby they express their willingness to use or willingness to pay for a commodity in response to a change in its provision (Small et al 2017). Such approaches are known as stated preference (SP) techniques and account for a suite of methodologies (e.g. Discrete Choice Experiments (DCE), Choice Modelling (CM), Contingent Valuation (CV)). Stated Preference techniques appear to resonate with the valuation of healthcare services and interventions which do

not always equate to a monetary value. Consequently, healthcare literature has recognised the significance of SP methodology in exploring value, preference and demand within the healthcare system (Verelst et al 2018, Hill et al 2017, Benjamin et al 2013, Norman et al 2013, Gerard et al 2004). A study using the SP technique of Discrete Choice Experiments and which resonates with the context of this research was conducted by Gerard et al (2004). The study investigated strength of preferences for attributes associated with modernising delivery of out of hours emergency care services. The study found that having a consultation with a doctor or nurse was the most important attribute, followed by being updated about waiting times. The findings of the study directly informed the development of a local service framework for emergency care.

Another SP technique is known as Contingent Behaviour (CB); CB is an SP technique that assesses the demand or preferences for a commodity. Such a commodity may take the form of goods, service, a facility or even a proposed policy or service reconfiguration. The CB approach estimates the benefits of quality improvement proposals by 'tracing out' public demand and response to proposed changes in provision or configuration of a commodity (Alberini et al 2006). In order to accrue this data, the CB methodology involves the distribution of a survey focusing on respondent's choices after consideration of a hypothetical scenario. The scenario defines a theoretical improvement in the quality of a proposed commodity and provides the participants with a series of choices regarding their individual preferences and behaviour in response to the perceived quality improvement (Kragt et al 2009). A paper exploring choice preference and physical activity behaviour used CB methods to provide an insight into the preferences and motivations for participating in physical activity compared with taking a tablet that would achieve the same health benefits. The study found that participants preferred to engage with physical activity rather than taking a medical tablet (Lynch 2011). This paper represents the first study to use elements of CB to develop a survey tool exploring an aspect of healthcare. Despite the uniqueness of such an approach it has demonstrated its potential in investigating patients' preferences in the choice of healthcare in the UK.

The second non-market technique uses an approach known as Revealed Preference (RP). Rather than considering hypothetical scenario as in the SP methods, RP approaches typically calculates the 'access value' attached to a commodity by exploring concepts such as money spent, time spent accessing a commodity RP techniques focus on collating observations of real-time behaviour in order to infer or estimate an economic 'access value' for a commodity (Lynch 2014, Whitehead et al

2007). It can be suggested that an 'access value' can articulate the 'economic burden' associated with accessing a healthcare services, a concept given little attention in the literature. One of the chief strengths of RP techniques is that they are grounded in the actual choices where individuals ruminate on, the internal costs and benefits of their actions and experience the consequences of their actions. Whitehead et al (2007) claim that choices based on the perceived costs and benefits (access value) better reflect the value of the population and permit more understanding of people's preferences. As with SP techniques, the RP techniques have also been utilised to explore healthcare issues (Ohshige et al 2004, Clarke 1996, Wang'ombe 1996).

One of the main RP techniques includes the Travel Cost Method (TCM). TMC is one of the oldest non-market valuation techniques. It has its roots and foundations in consumer theory and therefore has the ability to represent consumer choices and preferences. The methodology is concerned about how an individual decides to use a commodity considering all the factors involved in making a journey to a service or facility (Pearce and Turner 1990). In other words, when applying TCM, analysts attempt to explain the preference for a facility or service in relation to the trade off against travel costs, travel time and wages lost. This 'access value' combines the costs of traveling to ED, the amount of time spent travelling to ED, money spent whilst in the ED department and finally time value which is represented as hourly rate of pay (salary). This variable can then be considered a representation of what trade off the participant is willing to pay for their attendance to ED (Clarke 1996, 2002). The influence of 'access value' on the demand for healthcare services has been recognised as far back as the 1970s (Acton 1975, Sugden et al 1978). Such work highlights the significance of quantifying this 'access value' particularly in the absence of user fees. This lack of user fee is pertinent to the users of UK ED services, where the service can be considered 'zero-priced' at the point of access or consumption. As Sugden et al (1978, p.6) stress *'the fact a patient does not pay his GP for a consultation does not mean that consultations are costless to the patient.'* Therefore, the use of an 'access value' in research exploring the use and reconfiguration of healthcare services can be deemed appropriate in quantifying what patients are willing to trade off when they decide upon which service to access (Haab and McConnell 200). The first application of the TCM in healthcare literature was performed by Deyak and Smith (1976) who utilised the methodology to evaluate and measure the costs associated with accessing US abortion services. Their findings demonstrated demand for abortions was not associated with travel cost or the access value. Another example of a study using TCM within healthcare was conducted by Ohshige et al (2004), which explored the demand for annual healthcare check-ups based on travel time and

costs. The study found patients more willing to trade off an increase in travel time and costs (access value) to receive provision of preventative healthcare services.

A TCM survey also explores whether socio-demographic, socio-economic characteristics influence choices, preferences and demand for a commodity, which resonates with this study (Whitehead 2007). TCM data is predominately collated by means of a survey and may ask participants about the distance they travelled, the expenses they incurred, the length of the travel time spent getting to the facility or service, the quality of the experience when accessing the commodity, perceptions regarding the quality of the commodity and socio-economic and demographic statistics (Mathis 2003).

As previous discussion indicates, CB and TCM approaches are concerned with exploring the subject of preference and choice. Therefore, it was deemed fitting to use such principles in the design of a questionnaire investigating factors ability to predict choice of minor injury service and the motivation for such choices. A search of the literature indicated a lack of validated CB and TCM questionnaires aimed at exploring changes in health service delivery; consequently, this signified a need to explore the wider literature. Brownson et al (2004) compared the reliability and validity of three questionnaires exploring the relationship between quality of neighbourhood/environment features and physical activity and exercise: 'NEWS, the St Louis Environment and physical Activity Instrument' and the Environmental Supports for Physical Activity Questionnaire'. Brownson et al (2004) found that all three questionnaires demonstrated evidence of moderate to high reliability. Lynch (2014) acknowledged such results and used the 'NEWS', the 'St Louis Environment and Physical Activity Instrument' (Brownson et al 2001) to value the monetary impact of the built environment on physical activity/exercise. Consequently, the questionnaire designed and implemented by Lynch (2014) and 'NEWS' (Brownson et al 2001) was best fitted for the aims of this study. Therefore, the construct and design of such questionnaires resonated with the research question and aims and was found to be appropriate for exploring the preference of patients when selecting a minor injury service. Consequently, a TCM and CB approach to questionnaire design was adopted for use in this study.

3.6.1 Questionnaire Design

The questionnaire was designed using a combination of TCM and CB based questions, Table 3.3 summarises the TCM and CB questions included in the questionnaire. The TCM questions collated data measuring the benefit gained by individuals from using the ED (Haab and Mc Connell 2002).

The CB questions gathered information assessing the demand for ED or an ENP led MIU for treatment of a minor injury, given a hypothetical change in the provision of minor injury service. Exploration of the literature enabled the establishment of the demographic and socio-economic questionnaire items that have the potential to predict choice of minor injury service. Review of the available evidence also enabled identification and examination of existing survey instruments used in studies employing TCM and CB methodologies (Lynch 2014).

The questionnaire used in the research was made up of five distinct parts. The opening section of the questionnaire collated questions about post code and clinical presentation. Question 1 of the survey tool involved a question requesting the participants post code. This demographic information was transformed into a value known as a 'Welsh index of multiple deprivation' (WIMD) (Welsh Government 2019) which translates into the level of deprivation associated with the participant's address. It has been ascertained in the literature review that such a socio-economic variable could possibly predict preference and correlate with reasons behind such preference. WIMD is the official measure of relative deprivation for small areas in Wales; the value is calculated using eight separate domains of income, employment, health, education, housing, access to services, environment, and community safety. As this question collected data about a socio-economic variable it can be thought of a TCM question.

Question two of the questionnaire asked the participants to indicate their presenting injury/condition e.g. head injury, limb problem, burn or scald. This data about clinical presentation was intended to ascertain statistics about the sample recruited and the generalisability of findings to the wider ED patient population who were not included or sampled.

The second section of the questionnaire presented participants with a series of questions exploring their circumstances and views of their current trip to ED (Pearce and Turner 1990). Such questions replicated questioning found in TCM research. Questions 3, 4 and 5 involved collating information about previous use and perceptions of ED services and facilities. This included indicating previous trips made to ED and MIU in the last 12 months. Question 6 involved asking the participants Likert scale style questions establishing views about ED services, facilities and the environment. Question 10, 11, 12, 13 also presented participants with TCM questions that collated information regarding transport, travel time and amount of money spent whilst in the ED department. Table 3.3 summarises the TCM questions.

Table 3.3 TCM Questions (Access Value)

TCM Questions (Access Value)
Question 1: Post code (used to establish WIMD and level of deprivation)
Question 3: Have you used an Accident and Emergency (A&E) or Minor Injury Unit (MIU) in the past 12 months?
Question 5: When you attended A&E who were you treated by?
Question 4: How many times in total have you visited A&E or a MIU in the past 12 months?
Question 6: What are your thoughts and views about A&E and what it delivers?
Question 10: How did you get to A&E today?
Question 11: How long has it taken you to travel to A&E today?
Question 12: How many miles did you travel to A&E today?
Question 13: How much money did you spend getting to A&E and whilst in A&E?

Section three of the questionnaire involved CB (revealed preference) questionnaire items. Question 7 involved a CB question that presented the participants with a hypothetical scenario which involved offering an option of attending an ENP led MIU for the treatment of their minor injury instead of remaining in ED (Table 3.4). The scenario offered the participant a ‘trade off’ regarding waiting time. Such a ‘trade off’ involved a shorter waiting time (three hours less in the ENP led MIU compared with ED). The reasoning behind the utilisation of the three hour value involved using the average waiting time (at the time of the data collection) in the nearest ENP led MIU, this happened to be on average two to three hours less than ED. Dependent upon the response to the hypothetical scenario the questionnaire then continued to signpost the participant to Questions 8 and 9 that explored the logic and reasons behind their decision to stay in ED or use an ENP led MIU (Appendix 2).

Table 3.4 Contingent Behaviour Question

Contingent Behaviour Question
<p>Question 7: Consider the following ‘hypothetical’ situation: You attend the A&E department with a minor injury, the triage nurse informs you that you have the option to attend your local Emergency Nurse Practitioner (ENP) led Minor Injury Unit (MIU) where your injury will be assessed and treated by a fully trained ENP. The waiting time is 3 hours less in the ENP led MIU compared with the A&E Department. Given this choice which option would you choose?</p>

Section four of the questionnaire included questions gathering data about the demographic and socio-economic profile of the participant; this data would constitute the possible predictor variables. Such questions were placed at the end of the questionnaire as the literature suggests such ordering optimises participant engagement (Rattray and Jones 2005, Meadows 2003). Rattray and Jones (2005) argue that if demographic and socio-economic questions appear at the commencement of the questionnaire there is a risk that a participant will lose interest in the purpose and content of the survey, potentially threatening the chances of questionnaire completion (Rattray and Jones 2005). By assigning demographic and socio-economic questions considered sensitive (e.g. salary/rates of pay) to the end of a questionnaire, the chances of completion are increased. This is because participant rapport has already been established and maintained (Tabachnick and Fidell 2001).

Questions 14 and 15 collated information regarding the participant the demographics of gender and age respectively. Questions 16,17,18,21,22 collated data regarding socio-economic profile which included information regarding number of people in the household, ethnicity, marital status, qualifications, salary and employment. Such items were replicated from the 2011 census survey tool (Office of National Statistics 2011). Question 20 involved the collection of data in relation to the socio-economic variable of health status. The questionnaire item used a scale from a health status measurement instrument called EQ-5D-5L which collected responses to five domains of pain, mobility, usual activities, self-care and anxiety/ depression. The scale provides a single index value for health status and has a proven track record in healthcare literature, especially in population health surveys (EuroQol Group 2020). The EQ-5D-5L scale is designed for self-completion by participants and is ideally suited for surveys in clinics or in-patient settings. Naturally this is considered pertinent to this study where the questionnaire was distributed to patients in an ED waiting room. The EQ-5D-5L instrument has been validated across six countries (EuroQol Group 2020). Question 19 involved asking the participant about the mode of travel used to arrive at ED. Finally, the last section of the questionnaire concluded with Question 24 determining the participants opinion regarding the survey. This information would help determine aspects of questionnaire design requiring improvement.

3.6.2 Validity of Questionnaire

A fundamental element of the design process of the survey instrument was to ensure validity. To establish the validity of the questionnaire, that is whether it measures what it sets out to measure, face validity was used (Field 2009). Face validity as a measurement of validity involves asking others with an expertise or experience in the subject of study whether questionnaire appears to be focused on the concept being studied. This was deemed appropriate as the questionnaire utilised in this study was new and novel and validity had not been proven (Heale and Twycross 2015, Bryman 2008). Face validity has been criticised in the past for being the least sophisticated of validity measures. The main criticism is that face validity is a subjective measure and validity may differ from person to person which results in a weak measure of validity (Slocombe and Cole 1991). Face validity using a panel of experts has also been criticised for not identifying questions that participants may consider intrusive or offensive (Bryman 2008). In response to such critique, this study collected the opinions of two groups to ensure a greater breadth and depth of opinion.

Firstly, the study tapped into the judgement of a panel of experts deemed to have extensive knowledge and experience of emergency care, including that of minor injury services. The panel of experts included five emergency care consultants who were accessed via the primary researcher's clinical workplace (Royal Gwent ED). The panel also included 10 senior ENPs, accessed via a professional forum 'The Welsh ENP Network'. The network is made up of experienced ENPs working across emergency care in Wales. The primary researcher facilitates such a group therefore, access was achieved with ease. There was a 100% response rate from the expert panel members which enhanced the reliability of the gathered face validity data. Table 3.5 summarises the questions posed and the responses.

Table 3.5 Results of Face Validity Testing

Question	Response from Expert Panel	Questionnaire Amendments
Were the instructions clear regarding how to use the questionnaire?	Overall, the panel fed back favourably regarding the clarity of instructions about the questionnaire and found that the cover letter was comprehensive and provided clarity of context to the aims and objectives of the study.	

Were the questions easy to understand?	Five panel members expressed concerns that some of the questionnaire items relied on the assumption that the participant knew what an ENP or ENP led MIU was. They suggested the cover letter failed to articulate what an ENP could provide in means of treatment and care of a minor injury.	The cover letter was amended, and clarity provided regarding the role and function of an ENP and the service they provide.
Were there any questions that you would not feel comfortable completing?	Eight panel members expressed concerns that the question regarding salary could be deemed intrusive and unnecessary (Question 23).	Salary was an important value to capture in order to develop an access value. Therefore, although some panel members expressed concerns the question remained in the questionnaire.
What do you think about the length of the questionnaire?	One panel members expressed concerns that the Likert scale questions (Question 5) was too lengthy and that 30 items within this question was too laborious for the participants. The remaining 14 panel members believed that the Likert scale was an acceptable length.	
Can you anticipate any problems completing the questionnaire?	Five panel members reported that it was important to provide pens for the participants as it could not be assumed, they had access to such a resource.	Participants given a pen with the questionnaire

The face validity measure denoted minimal changes were required to the questionnaire structure and content, however, where appropriate amendments were made (see table 3.5).

3.7 Bias

To reduce bias and increase generalisability, recruitment took place seven days a week, 24 hours a day (Valley et al 2012). It was acknowledged that the decision to exclude non-English-speaking groups (excluding Welsh speaking patients) or patients with literacy issues may create bias. To establish whether these exclusion criteria created bias, the triage nurses were asked to record on a blank questionnaire when a participant was excluded due literacy or language barriers. It was found

that only two patients were excluded due to such factors; therefore it was deemed that such exclusion criteria would not have generated a significant bias.

3.8 Rigour

3.8.1 Generalisability

To establish generalisability of the survey findings, it was essential to compare the sample with other data sources which describe the demographic profile of the local population. Firstly, using the demographics captured on the patient management software (utilised in the ED setting to capture information regarding patients and their ED admission), the study compared the sample characteristics with those found in the wider ED population (non-sampled population) (n=24949). This includes the minor injury patients who did not take part in the study, however presented to ED during the data collection period (Feb 2016 – March 2017).

Comparing the demographic and socio-economic profile of the sample to the findings of the 2011 Welsh census was considered, however this was rejected as it cannot be assumed that national data is representative of the locality involved in the study. It is also questionable whether the statistics ascertained from the census data would be comparable to the sample, as they include data describing those under 18 years, an age group excluded from the study. As an alternative the demographic and socio-economic descriptive data generated from the study were compared with both local statistics from the ED catchment area and the wider Welsh population (Statistics Wales 2020).

3.8.2 Pilot Study

A pilot study was conducted to ensure that the methodology and the data collected addressed the aims and objectives of the study and had the ability to answer the research question. As the study used an unvalidated questionnaire, the pilot study enabled a trial of the questionnaire to establish rigour. The pilot study was able to identify any questions frequently missed, sufficiency of instructions to the participants and the data collectors (triage nurses) and issues with the recruitment process (Bryman 2008). The pilot study ran between 7th May 2016 and 9th May 2016 and involved the enlistment of 15 participants.

The data set was also tested for reliability by using the test-retest method. This involved administering some questionnaire items to the same participants on two separate occasions (Bryman 2008). This test-retest approach necessitated the participants (n=15) receiving a telephone

follow up one week after completion of the questionnaire (by the primary researcher). During this follow up call the participant was asked to redo questionnaire items seven (choice of minor injury service) eight (reasons for choosing ED) and nine (reasons for choosing ENP led MIU) over the phone to test reliability. Ten out of the 15 participants were contactable by phone and willing to repeat the questionnaire items. The gathering of such data enabled investigation of the correlation between the initial answers and the responses generated from the telephone follow up call.

The statistic used to assess the test-retest reliability was Cohen's Kappa, which is suitable for the assessment of categorical data repeated on two occasions (Laerd Statistics 2020). It was found that all participants reported the same choice response to the hypothetical scenario posed by Question Seven (ED versus ENP led MIU). Therefore, the Cohen's Kappa coefficient was 1.0 with a statistical significance of $p < .005$; this indicated the two sets of responses were the same. In relation to Question eight (reasons for choosing an ENP led MIU) the Cohen's Kappa test was run which determined a good strength of correlation (.63) which was statistically significant ($p < 0.05$). Regarding Question nine (reasons for staying in ED) it was difficult to run the test-retest analysis as all participants had chosen to attend an ENP led MIU. From such results it can be concluded that the questions were reliable, although it is important to note that this reliability test was only conducted on a relatively small sample of 10 participants.

The participants in the pilot study reported positively regarding the questionnaire instructions and all found the questionnaire structure and process easy to follow. All understood the purpose of the questionnaire and how the information would inform practice. There were no negative comments regarding the comprehension of the questions and all participants commented positively about the way in which the questions were structured and delivered. In regard to the question ascertaining salary, four out of the 10 participants stated they felt uncomfortable completing the questionnaire and struggled to understand the relevance to the aims of the study. Only one of the participants found the questionnaire too long; the remaining nine were happy with the length of the questionnaire.

Conducting the pilot study enabled an opportunity to refine the approach to conducting the study and identify potential issues or challenges that may threaten the implementation of the main study. The pilot study enabled the testing of a non-validated questionnaire and essentially established minimal changes to the content and structure of the questionnaire.

3.9 Ethical Considerations

3.9.1 Ethical Approval

Prior to data collection ethical approval for the study obtained from:

- Cardiff University School of Healthcare studies – August 11th 2015 (Appendix 4)
- Host health board research and development department - 1st March 2016 (Appendix 5)
- NHS National Research Ethics Service (NRES) - 27th January 2016 (Appendix 6)

3.9.2 Risks

It was made clear to the triage nurses distributing the questionnaires that they were able to relinquish their role at any point during the study, without prejudice. This notion was reinforced with the triage nurses at all stages of the study.

It was argued that the recruitment process could potentially increase the clinical workload of the triage nurse and consequently increase the amount of time each patient waited for initial ED assessment. This could have had several potential negative connotations; firstly delays in initial assessment may have led to a reduction in patient safety and secondly impede compliance with ED waiting time targets (four hour waiting target and 15 minutes to triage). To minimise such patient assessment/triage delays recruitment ceased if the wait for triage breached 30 minutes. The patients completed the survey whilst waiting for assessment, medical interventions, or investigations; therefore, completion of the questionnaire did not impede the timeliness or the quality of care whilst in the ED department.

All the risks were outlined in the patient information sheet to ensure that the participant was able to make informed consent to be included in the research (Appendix 1).

3.9.3 Anonymity

The closed questions ensured the pertinent information was collated, yet the anonymity of the participant was maintained. Anonymity was also achieved when establishing socio- economic and demographic data; this involved opting to ask for age in years rather than specific dates of birth and requesting a post code to establish geographical area of residence rather than a full address.

The issue of anonymity was approached differently in the pilot study. As patients had to be contacted at home to provide feedback upon the 'usability' of the questionnaire and the research

process, personal details such as address, email and telephone number were collected, and identification codes were given to each questionnaire. Such identification codes were only known to the researcher.

3.9.4 Consent

Once the triage nurse had identified an appropriate patient the details of the study were explained to the participant. A patient information sheet (PIS) was provided (Appendix 1), describing details such as risks, aims and objectives, storage of data and confidentiality. All documents were available in Welsh. A formal consent form was not used, as assumed consent was determined with completion and return of the questionnaire, as clarified in the REC approved PIS. There was limited time for the participant to consider participation in the study due to pace of the triage process; however, this was negated as the patient had time whilst waiting to see a clinician to withdraw from the study.

3.9.5 Confidentiality

Recruitment of participants was performed within the privacy of the triage room thus maintaining confidentiality. A locked ballot box was provided in the waiting room for participants to deposit the completed questionnaire. To ensure confidentiality, the completed questionnaires were removed from the locked box by the primary researcher at regular intervals and stored in a locked filing cabinet in the ED department.

The records generated by the research were a mixture of written and electronic material and they were managed according to the Data Protection Act (1998) (GDPR not in effect at the time of the data collection). The data took on numerous formats:

- Primary data (questionnaires)
- Analysed data (databases, spread sheets)
- Records of project management
- Supporting documents

The written material was kept in a locked cabinet in a locked office within the ED department with access limited to the primary researcher.

After completion of the research the written data will be stored in Cardiff University's off-site storage facility in locked and labelled boxes. The electronic records will be saved to data storage

devices and stored along with the written data to prevent accidental damage and loss. The records will be kept for 15 years.

3.10 Data Processing

This following section will describe how the data were processed in preparation for analysis. This will begin by describing how the variables associated with level of deprivation and ‘access value’ were constructed. The section will continue by describing the characteristics of the variables taken forward to data analysis, including what type of data they represent (e.g. continuous, categorical) and when appropriate the nature of distribution (i.e. normal versus non normal distribution).

3.10.1 Construction of Level of Deprivation Variable

To establish an insight into the level of deprivation within the sample, the residential post codes were used to establish the Welsh Index of Multiple Deprivation (WIMD). WIMD is the official measure of relative deprivation for small areas in Wales (Welsh Government 2019). WIMD is made up of eight separate domains of deprivation: income, employment, health, education, housing, access to services, environment, and community safety. Such domains are combined to provide an overall deprivation rank for each of the 1909 Welsh lower super output areas (LSOA). Rank 1 indicates an LSOA with a high level of deprivation whereas a LSOA with a rank of 1909 is considered an area of low deprivation. The WIMD value is collapsed into five categories of deprivation; the categories range from the most deprived to the least deprived, these categories are summarised in table 3.6 (Welsh Government 2019). Table 3.6 indicates ABUHB has more LSOAs considered to have the highest level of deprivation (178) compared with LSOAs with lower levels (120). The remaining LSOAs fall into the middle/median group (70). The variable of deprivation using WIMD can be considered continuous data.

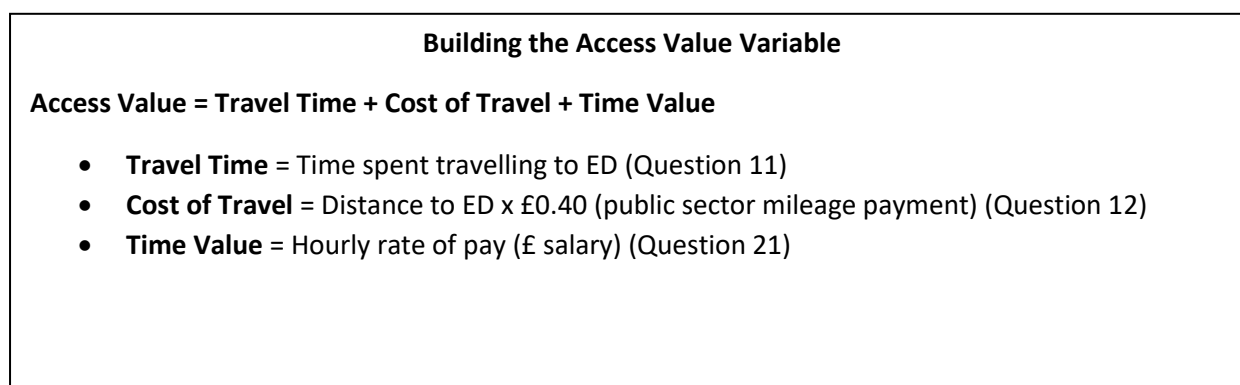
Table 3.6 Categories of WIMD and ABUHB LSOAs

WIMD Value	Level of Deprivation	Number of LSOAs in ABUHB
1 - 382	Most deprived	97
383 – 764	Next most deprived	81
765 – 1146	Middle/median	70
1147 – 1528	Next least deprived	52
1529 – 1909	Least deprived	68

3.10.2 Construction and Calculation of the Access Value

As described previously, the 'access value' variable acknowledges the 'economic burden' of each participant accessing a service. Some of the TCM based questions originating from the questionnaire were used to calculate the 'access value' for each participant. Fig 3.0 summarises how the 'access value' was calculated and the corresponding items in the questionnaire.

Fig 3.0 Building the Access Value Variable



The first question to provide data to generate an 'access value' was Question 11; the participants was asked how long it took them to travel to the ED department in hours and minutes. The second question producing data used in the calculation of the 'access value' variable, was regarding the distance travelled to attend the ED service in miles. To transform this data into 'cost of travel', the value of £0.40 per mile was utilised, this value was used as it was comparable to the public-sector mileage travel payments (at time of data collection of £0.40/mile (HM Revenue and Customs 2019)). It was determined that the use of current fuel prices was not appropriate due to the level of current price fluctuation. Finally, Question 21 provided data were was used to establish time value; this involved asking participants about their hourly rate of pay.

As the TCM variable utilised travel time to ED, cost of travel, distance to ED salary and employment these variables will not be included separately in the data analysis.

The first stage to the calculation was to construct a cost of travel variable. This was achieved by multiplying the value found in the distance to ED (miles) by the public sector mileage payment

(£0.40). The creation of the cost of travel variable enabled the generation of an 'access value' variable using the equation outlined in Fig 3.1

Fig 3.1 Calculation of the Access Value

<p style="text-align: center;">Access variable = Travel time + Cost of travel + Salary (time value)</p> <ul style="list-style-type: none">• Cost of travel = Distance to ED x £0.40 (public sector mileage payment)• Travel time = Time taken to travel to ED (minutes)• Hourly rate of pay (£ salary)
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3.10.1 Managing Missing Values

Missing data are not uncommon in survey research and occurs for a range of reasons, such as invalid data entry, refusal to answer the question and input error (Bryman 2008, Musil et al 2002). Cases with missing values pose a significant challenge with the potential to limit the generalisability of findings, create potential bias and jeopardise the integrity of the study (Altman and Bland 2007, Byrne 2000). Acknowledging the potential influence of missing data on the reliability of the statistical analysis, it is paramount that the issue of missing data is addressed.

Before a missing value strategy is established there was a need to question what is considered a significant level of missing data. The literature indicates that there is no consensus about what constitutes this value (Newgard et al 2006). However, the literature suggests that missing data rates of < 5% can be considered small and elicit little effect upon result. Subsequently, such levels can be managed with any missing data technique (Schumaker and Lomax 2004, Roth and Switzer 1999, Cohen and Cohen 1983). Frequency statistics were run to establish the percentage of missing values.

3.10.2 Outliers

The descriptive data were also checked for outliers; this involved screening the data for scores that were more extreme than the rest (Dancey et al 2012). The identification of outliers was used to cross reference the questionnaires and screen for input error; the data were amended and cleaned accordingly.

3.10.3 Characteristics of the Variables

The variables identified for analysis (see Section 2.8) fell into two groups. Firstly, the dependent variables of ‘choice of minor injury service’ and ‘reasons for choice’. The second group were the independent variables assumed to have a direct effect on the dependent variable (Pallant 2013). This group of was made up of demographic and socio-economic variables, which in the context of this study, were also considered possible predictor variables.

To identify the appropriate statistical techniques for the correlation analysis of the dependent and independent (predictor variables) the nature of the generated data was examined. This is tabulated in Table 3.7. The variables formulated from continuous data (age, level of deprivation, ‘access value’) were examined in terms of normal distribution (normality testing). This assisted the selection of the appropriate statistical analysis technique (parametric versus non-parametric). To assess the normal distribution of the continuous variables the Shapiro-Wilkes test of normality was instigated (Field 2009). A p value of $< .50$ was used to establish a non-normal distribution (Petrie and Sabin 2009). The results of normality testing for the continuous variables are tabulated in Table 3.7.

Table 3.7 Variable Characteristics

Variable	Type of data	Shapiro-Wilkes	Significance
Gender	Dichotomous		
Age	Continuous	.944	.000
Ethnicity	Categorical		
Level of deprivation	Continuous	.909	.000
Access value	Continuous	.884	.000
Marital status	Categorical		
Qualifications	Categorical		
Number of people in household	Categorical		
Health status	Categorical		

Choice of minor injury service	Dichotomous
Reasons for choice of minor injury service	Categorical

3.11 Data Analysis

3.11.1 Data Analysis Package

The quantitative data were analysed using the IBM statistical package ‘Statistical Package for the Social Sciences’ (SPSS) version 22.0.

3.11.2 Descriptive Statistics

The data analysis commenced with scrutiny and profiling of the descriptive statistics which generated a greater understanding of the salient features of the data, and assisted contextualisation of the study (Delaney 2009). The descriptive statistics involved comparing the characteristics of the study participants with local statistics and those of the wider ED population (participants not sampled during the data collection period). Exploring the descriptive statistics facilitated an understanding of how representative the sample was of the general population (Dancey et al 2012). The descriptive statistics used frequencies, means, medians and standard deviations. As Table 3.7 demonstrates the continuous variables of age, level of deprivation and ‘access value’ were deemed to have a non-normal distribution; therefore, it was decided to present the descriptive statistics of median and interquartile values to articulate the distribution of data (Harris and Taylor 2008). The descriptive statistics articulating the dependent variables of choice of minor injury service and reasons for choice were explored and presented using cross tabulation (Field 2009).

Finally, the descriptive statistics examined the levels and patterns of missing data. The results of such analysis were then employed to determine an appropriate strategy to deal with any missing values.

3.11.3 Correlation Analysis

It was decided that logistic regression analysis was an appropriate inferential statistical technique to explore and predict the influence of socio-economic and demographic variables on minor injury service choice. However, before logistic regression analysis was conducted, it was necessary to decide which predictor variables would be entered into the logistic regression model. It was

decided that predictor variables would be selected if a statistically significant relationship or association was determined with the dependent variable of minor injury service choice.

To add an extra contextual layer to the reasons behind the choice of minor injury service, correlation analysis was also run between the demographic and socio-economic variables found to have a correlation with choice of minor injury service.

Prior to the correlation analysis, it was necessary to select the correct statistical test; the following section sets out the decision making involved in selecting the appropriate statistical approaches to analysis.

3.11.4 Justification of Statistical Tests for the Correlation Analysis

The following section will describe the decision making associated with the selection of a statistical test used to explore the correlation between demographic and socio-economic variables and choice of minor injury service (dichotomous variable) and the reasons behind such choices (categorical variable).

3.11.4.1 Assessing Correlation Between the Continuous Variables (Age, Level of Deprivation and Access Value) with Choice of Minor Injury Service (Dichotomous Variable) and Reasons for Choice (Categorical Variables)

Spearman's Rho correlation was chosen to measure the correlation between the choice of minor injury service (dichotomous variable) and the continuous variables of age, level of deprivation and 'access value'. This decision was made as all the continuous variables were non-normally distributed (see Table 3.7), and as such failed the assumption of parametric testing, that being the data needed to be normally distributed (Field 2009). In response, the non-parametric Spearman's rho correlation was chosen, as it can be considered an alternative to parametric tests (Prion and Haerling 2014, Bryman 2008).

3.11.4.2 Assessing Correlation Between the Demographic and Socio-economic Categorical Variables and Choice of Minor Injury Service

The following section will justify the statistical tests used to explore the correlation between the categorical variables of gender, ethnicity, marital status, qualifications, people in the household and health status with choice of minor injury service (dichotomous variable) and the reasons for such a choice (categorical variable).

3.11.4.2.1 Gender

Since the correlation between gender and choice of minor injury service involved a 2x2 table (i.e. each variable has only two categories) the ‘Yates continuity correction’ (continuity correction) value was utilised, this value compensates for the overestimate of the chi-square value when used in conjunction with a 2x2 table (Pallant 2013).

3.11.4.2.2 Ethnicity

To explore the correlation between ethnicity and minor injury service choice, the ‘Chi-square test of independence’ was contemplated. This statistical test was selected as it explored the relationship between two categorical variables with a contingency table greater than 2x2 (Laerd Statistics). However, exploring the crosstabulation regarding ethnicity and minor injury service choice it was found that it broke the assumption associated with the chi-square test of independence, that is that all cells should have counts more than five. Therefore, it was decided to collapse the categories in the ethnicity variable from eight categories to five (Pallant 2013). This produced contingency tables that had no cells with an expected cell count less than five, thus meeting the chi-square test assumption. This was done by combing the ethnic groups of Chinese, Arab and Hispanic/Latino into one category. Table 3.8 outlines the new categories found in the ethnicity variable.

Table 3.8 Collapsed Ethnicity Variable

Collapsed Variable	n	%
Ethnicity		
White British	450	90.0
White non-British	5	5.4
Black/African/Caribbean/Black British	27	1.0
Asian/Asian British	10	1.0
Other ethnic groups (e.g. Chinese/Arab/Hispanic/Latino)	7	7.0

3.11.4.2.3 Marital Status

To explore the correlation between marital status and choice of minor injury service, the chi-square test of independence was considered. This statistical test was selected as it explored the relationship between two categorical variables with a contingency table greater than 2x2 (Laerd Statistics). However, exploring the crosstabulation regarding marital status and choice of minor injury service it was found that the assumption associated with chi-square test of independence

was broken, that is all cells should have counts more than five. Therefore, it was decided to collapse the categories found in the marital status variable. This produced contingency tables that had no cells with an expected cell count less than five, thus meeting the assumptions of the chi-square test of independence. The marital status variable was collapsed into two responses 'Married/ civil partnership' or 'Not married or widowed' (see Table 3.9). As the new categories were dichotomous, the analysis applied the statistical test Phi.

Table 3.9 Collapsed Marital Status Variables

Collapsed Variable	n	%
Marital Status		
Married/civil partnership	259	51.8
Not married/widowed	236	47.2

3.11.4.2.4 Qualifications

To explore the correlation between qualifications and choice of minor injury service chi-square test of independence was considered as a possible statistical test to ascertain correlation. However, exploring the crosstabulation regarding qualifications and choice of minor injury service it was found that the assumption associated with the chi-square test of independence was broken, that is all cells should have counts more than five. Therefore, it was decided to collapse the categories found in the qualification's variable, this produced contingency tables that had no cells with an expected cell count less than five, thus meeting the assumptions of the chi-square test of independence. The qualifications variable was collapsed into two responses qualifications and no qualifications. As the new categories were dichotomous, the analysis applied the statistical test Phi.

Table 3.10 Collapsed Qualification Variable

Collapsed Variable	n	%
Qualifications		
Qualifications	394	78.8
No qualifications	95	19.0

3.11.4.2.5 Number of People in Household

Spearman's correlation was deemed appropriate for the exploration of people in a patient's household and choice of minor injury service. This statistical test was selected as it explored the correlation between a dichotomous dependent variable and a discrete independent variable. No assumptions of Spearman's correlation were broken.

3.11.4.2.6 Health Status

To explore the correlation between health status and minor injury service choice 'chi-square test of independence' was used. This statistical test was selected as it explored the relationship between two categorical variables with a contingency table greater than 2x2 (r x c contingency table) (Laerd Statistics). Exploring the contingency tables of minor injury service choice and the health status variables (mobility, self-care, usual activities, pain and discomfort, anxiety and depression) > 80% of cells had counts < 5, thus meeting the assumptions of 'chi-square test of independence'.

3.11.5 Assessing Correlation Between Age, Level of Deprivation, and Reasons for Choice of Minor Injury Service

The two variables taken forward for an extra layer of correlation analysis were age and level of deprivation. This correlation analysis involved exploring the relationship between such variables and the reasons for attending an ED or ENP led MIU for a minor injury service.

The chi-square test of independence was considered for the correlation analysis of the continuous variables of age, level of deprivation and reason for service choice. This was because the reason for choice variables had more than two categories and the variables of age and level of deprivation and were continuous. However, on further examination of the contingency tabulations between the continuous variables and the reasons for minor injury service choice it was found the data violated an assumption associated with chi-square test of independence. The assumption violated was the 'minimum expected cell frequency', which should be five or greater (or at least 80% of cells having expected frequencies of five or more) (Pallant 2013). In response to such assumption violation an alternative test was selected, this was the non-parametric test of the likelihood ratio statistic (Field 2009).

3.11.6 Logistic Regression Analysis

Logistic regression was used to determine which demographic and socio-economic variables predicted choice of minor injury service (ED versus ENP led MIU) and to determine whether it was

possible to establish a predictor model (Peacock and Peacock 2011). Logistic regression offered a natural addition from a straightforward comparison of proportions to an analysis that accommodates multiple predictor variables (Wiest et al 2015). Logistic regression was considered an appropriate statistical test as it can analyse a combination of data types, including dichotomous and categorical data, which was the case in this analysis (Tabachnick and Fidell 2001).

Logistic regression as an analytical tool was selected as unlike traditional linear regression; logistic regression is deemed appropriate for modelling a dichotomous dependent variable such as choice of minor injury service (Hilbe 2016, Field 2009). Unlike linear regression, when using logistic regression, you are not endeavouring to establish the predicted value of the dependent variable, but the probability of falling into a specific category of the dependent category (choice of minor injury service) given the independent category (demographic and socio-economic variables). Logistic regression was also deemed appropriate for the type of data exhibited in the predictor variable, that is a combination of continuous, categorical and dichotomous data (Tabachnick and Fidell 2001).

The objective of logistic regression is to accurately predict the category of outcome for individual cases. The initial stage was to determine whether there is a relationship between the choice of minor injury service (ED versus ENP led MIU) and the possible predictor demographic and socio-economic variable (Tabachnick and Fidell 2001). The correlation section of the analysis established the predictor variables that were statistically associated with the dependent variable of service choice; these variables were then used to assemble a list of candidate predictor variables for the logistic regression model (Bowers 2008). All the candidate predictor variables were checked against the following assumptions associated with logistic regression:

- Sample size
- Multicollinearity (high intercorrelation among independent variables)
- Check for high intercorrelations among your predictor variables

All the predictor variables were imputed into the logistic regression model using the 'forced entry' method which involved placing all the predictor variables in the model in one block (Field 2009). Once the model was generated the p value of each predictor variable was examined for statistical significance ($p = < .05$). If a predictor variable was not statistically significant then it was rejected; this was continued until a rigid group of predictors had been established, thus simplifying the

predictor model whilst maintaining strong prediction (Jacobsen 2017, Tabachnick and Fidell 2001). After this analysis was complete, it was possible to identify the socio-economic or demographic characteristics that could be used to predict a patient's choice of minor injury service.

3.12 Chapter Summary

This chapter reviewed the stages undertaken in the development of cross-sectional design using the STROBE template (Appendix 3) and highlighted the phases involved in the design and development of the study protocol. The chapter described how the survey tool was developed using the techniques and principles of TCM (RP) and CB (SP). The strategy of purposive sampling was described and how the inclusion and exclusion criteria were established and rationalised. The chapter continued by establishing how the prospective participants were identified, approached, and recruited. The chapter appraised the governance framework applied to the research and how ethical approval was achieved. The processes associated with establishing study rigour were then discussed, which included the findings and outcomes from the pilot study. The chapter continued by determining and justifying the statistical approach to data analysis, including descriptive statistics, correlation analysis and logistic regression analysis. Finally, the issue of missing data was discussed and how the study managed such an issue.

Chapter 4 Results

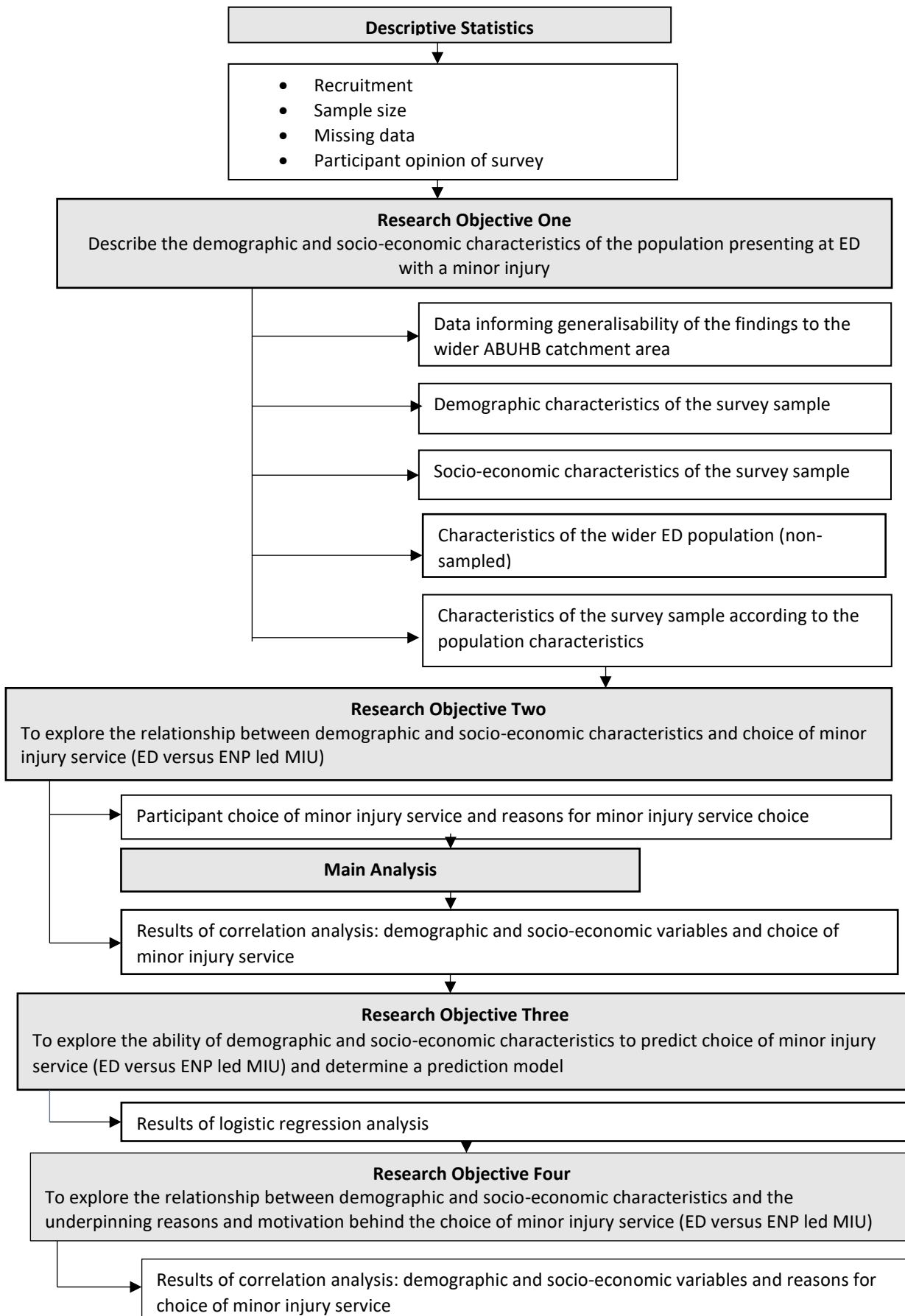
4.1 Introduction

The purpose of this chapter is to report the results of the descriptive and inferential statistics obtained from the survey, designed to elicit participants choice of minor injury service and the reasons behind such choice. The research objectives frame the structure of the results chapter and are summarised in Fig 4.0. The chapter will begin by presenting the data pertaining to the methodological elements of the study; this includes sample size, missing data, and participant opinion of the survey. The descriptive statistics reporting the generalisability of the findings to the larger population will then be presented. This will involve describing and comparing the demographic and socio-economic characteristics to the wider (non-sampled) ED population and the population statistics of the ABUHB catchment area.

The results of correlation analysis will then be reported, which scrutinise the relationship between demographic/socio-economic factors and choice of minor injury service choice (ED versus ENP led MIU). The results of the logistic regression will then be presented, which aim to predict the likelihood of choosing an ED or ENP led MIU for minor injury service based on demographic and socio-economic factors.

The chapter will then present the results from the correlation analysis associated with demographic/socio-economic factors and reasons for minor injury service choice. Finally, the chapter will conclude with a summary of the results.

Fig 4.0 Structure of the Results Chapter



4.2 Descriptive Statistics

The following sections will present results of the descriptive data analysis. This will start by presenting the descriptive statistics regarding the methodological components of the study, such as participant recruitment, sample size, missing data, and participant view of the survey. This will then be followed by a presentation of the descriptive statistics regarding the characteristics of the sample population and how this compares with the wider ED population and the population statistics of the ABUHB catchment area.

4.2.1 Participant Recruitment

A total of 500 questionnaires were collated over a 10-month period. As the study collected the questionnaires via purposive sampling there were no descriptive data regarding how many questionnaires were distributed and what percentage were completed. The study continued the data collection phase until 500 questionnaires had been gathered.

4.2.2 Sample Size

According to the recommendations and calculations set out in the methodology chapter the target sample size was $n=500$, via purposive sampling. This target was achieved.

4.2.3 Missing Data

The following section summarises the frequencies of missing values found in the data set; this is summarised in Table 4.0. The item with the most missing values and with a frequency of $> 5\%$ involved the question exploring salary, 22.6% ($n=113$) of participants failed to complete the question (see Section 3.12.4 for justification for this value). Ten of the participants who did not complete the income question added a written comment expressing their reluctance to provide such information, primarily because they, perceived the question to be intrusive and were reluctant to divulge such sensitive data.

The variable with the second highest level of missing values and with a frequency $> 5\%$ was postcodes 12.2% ($n=61$); this included not only missing values but also responses that included non-existent postcodes. The incorrect postcodes were identified when they were computed into a WIMD value; consequently, the same rate of missing values was evident in the WIMD variable (12.2% ($n=61$)). The remaining variables involved in the analysis had rates of missing data that were considered low ($< 5\%$).

Table 4.0 Frequency of Missing Values

Variable	n	%
Gender	13	2.6
Age	16	3.2
Ethnicity	1	0.2
Level of deprivation (post code)	61	23.2
Distance travelled to ED	6	1.2
Time spent travelling to ED	6	1.2
Salary	113	22.6
Access value	0	0
Marital status	5	1
Qualifications	11	2.2
People in household	4	0.8
Opinion of survey	52	10.4

After exploring the frequency of missing values in the variables involved in the statistical analysis it was the necessary to decide what appropriate methods were to be instigated to address the missing data.

Having identified that salary was a variable with a high level of missing values 21.2% (n=106) it was important to identify an appropriate missing data technique. The high rate of missing values within the salary variable was confounded by the participants who stated they were retired/unemployed/long-term disabled or sick. These participants would be recorded as having no salary even though they may still generate income via social benefits or pensions. As a result of such factors, it was decided to align categories of economic inactivity to an appropriate income value.

The approximated income rate associated with participants who were unemployed was calculated by combining the current benefits of job seekers allowance, income support and housing benefit. The same process was implemented with participants who were considered long-term disabled or sick using the benefits of income support, housing benefit and disability living allowance (Giv.UK 2020). The retired salary was calculated on average retired income £18,100/year (inclusive of private pension provision and state pension) (Jefferies 2017) The following values were generated:

- Unemployed participants £5.96/hour
- Retired participants £9.28/hour
- Long-term disabled or sick participants £7.56/hour

* The values generated above do not account for other sources of income that the participants may be receiving.

4.2.4 Participants' Opinion of the Survey

To establish how participants viewed the contents of the questionnaire Table 4.1 tabulates the data regarding opinion of the survey. It is envisaged that such information could help inform future amendment of the survey tool. The presented results indicate that 52% (n=260) of the study sample found the survey interesting, 16% (n=80) found the questionnaire informative, which accounts for 67.4% (n=337) of the population feeding back in a positive manner regarding the survey process and questionnaire. Overall, 5%(n=25) found the survey unrealistic (not relevant) 15% (n=75) found it too long with 2.2% (n=11) finding the questionnaire difficult to understand. This equates to 22% (n=110) of the sample considering the survey in a negative manner. This leaves 10.4% (n=52) of the sample failing to complete the question relating to opinion of survey.

Table 4.1 Participant Opinion of Survey

Opinion of Survey	n	%
Interesting	261	51.6
Unrealistic	26	5.1
Too long	74	14.6
Informative	76	15.0
Difficult to understand	11	2.2
Total	448	88.5

4.2.5 Data Informing the Generalisability of the Sample

Research Objective One
Describe the demographic and socio-economic characteristics of the population presenting at ED with a minor injury

Research Objective One involves describing the demographic and socio-economic characteristics of the population presenting to ED with a minor injury. The following section reports the results that fulfil such an objective.

To explore how generalisable the findings are to the wider population attending the ED and population of the ABUHB catchment area, the study gathered and analysed data from two sources.

Firstly, the study examined data collated from the wider ED population, including gender, age, and clinical presentation. Such data represented patients with a minor injury/illness that attended ED during the same period but did not complete a survey, i.e. not sampled during the data collection period (n=24949). It was not possible to collate any more comparable variables from the wider ED population due to the unavailability of such data on the patient management software (Symphony). Secondly, to establish how the survey sample represented the wider population, the study analysed the demographic and socio-economic characteristics of the survey sample and compared with the population statistics of the ABUHB catchment area.

4.2.5.1 Demographic Characteristics of the Survey Sample

To deliver on Research Objective One the following section will present the characteristics of the demographic variables. The characteristics of the demographic variables taken forward into the main analysis are found in Table 4.2

Table 4.2 Demographic Characteristics of the Survey Sample

Demographic Variable		n	%	Range (Min-max)	Median	Interquartile range
Gender	Male	257	51.4			
	Female	230	46.0			
	Total	487	97.4			
<hr/>						
Age (years)		484	96.8	18-93	39.0	28.0
<hr/>						
Ethnicity	White British	450	90			
	White (non-British)	27	5.4			
	Black/African/Caribbean/Black British	5	1.0			
	Asian/Asian British	10	2.0			
	Mixed/Multiple ethnic groups	7	1.4			
	Total	499	99.8			

4.2.5.2 Socio-economic Characteristics of the Survey Sample

To deliver on Research Objective One the following section will present the characteristics of the socio-economic variables. The characteristics of the socio-economic variables taken forward to the main analysis are described in Table 4.3.

Table 4.3 Socio-economic Characteristics of the Survey Sample

Socio-economic Variable		n	%	Median	Interquartile Range
Level of Deprivation				5.0	6.0
Access Value				31.5	19.73
Marital Status	Never married/never registered a same sex civil Partnership	108	21.6		
	Married	200	40.0		
	Same sex civil partnership	5	1.0		
	Separated	7	1.4		
	Widowed	22	4.4		
	Divorced	42	8.4		
	A member of an unmarried couple	57	11.4		
	Civil partnership	23	4.6		
	Would rather not say	31	6.2		
Total		495	99.0		
Number of People in the Household	1	73	14.4		
	2	161	31.8		
	3	113	22.3		
	4	84	16.6		
	5	43	8.5		
	6	17	3.4		
	7+	5	1.0		
Total		496	98.0		
Mobility	No problems	349	69.8		
	Slight problems with walking	55	11		
	Moderate problems with walking	43	8.6		
	Severe problems with walking	33	6.6		
	Total	483	96.6		
Self-Care	No problems washing and dressing	414	82.8		
	Slight problems washing and dressing	29	5.8		
	Moderate problems washing and dressing	22	4.4		
	Severe problems washing and dressing	10	2.0		
	Unable to wash and dress by self	5	1.0		
Total		480	96.0		
Pain and Discomfort	No pain and discomfort	185	37.0		
	Slight pain and discomfort	90	18.0		
	Moderate pain or discomfort	125	25.0		
	Severe pain or discomfort	60	12.0		
	Extreme pain or discomfort	18	3.6		
Total		478	93.9		

Anxiety and Depression	Not anxious or depressed	321	64.2
	Slightly anxious or depressed	55	11.0
	Moderately anxious or depressed	47	9.4
	Severely anxious and depressed	26	5.2
	Extremely anxious or depressed	1	0.2
	Total	450	90

4.2.5.3 Characteristics of the Wider ED Population (Non-Sampled)

Table 4.5 summarises the characteristics associated with gender, age and clinical presentation and compares such details with the wider ED population (non-sampled).

Table 4.4 Characteristics of the Wider Adult Population (Non-Sampled) Compared with the Characteristics of the Sampled Participants

Wider ED Population (non-sampled) Characteristics		n	%	Mean	Median	SD	Range (min-max)	Characteristics of Participants Sampled	n	%	Mean	Median	SD	Range (min-max)
Gender	Male	13364	53.5						257	51.4				
	Female	11615	46.5						230	46.0				
Age (years)		24949		42	38.2	133.41	18-101		484	96.8	43.1	39.0	17.9	18-93
Clinical Presentation	Allergy	100	0.4						1	0.2				
	Back or neck pain	1573	6.3						48	9.6				
	Burn or scald	220	0.88						14	2.8				
	Chest problem	405	1.62						12	2.4				
	Collapse	30	0.12						6	1.2				
	Ear nose and throat	622	2.49						13	2.6				
	Eye problem	1621	6.49						20	4.0				
	Gynaecological problem	150	0.6						1	0.2				
	Head injury	1778	7.12						51	10.2				
	Limb injury/problem	10883	43.57						220	44.0				
	Mental health issue	190	0.76						7	1.4				
	Pregnancy problem	290	1.16						5	1.0				
	Skin problem	105	0.42						9	1.8				
	Stomach injury/problem	325	1.3						12	2.4				
	Urological injury/problem	225	0.9						1	0.2				
	Wound	592	2.37						76	5.2				
	Other (urgent presentations)	5870	23.5						3	0.6				
Total		24949	100						499	99.8				

4.2.5.4 Characteristics of the Survey Sample Compared with the Population Statistics of the ABUHB Catchment Area

The following section will present the demographic and socio-economic characteristics of the survey sample (n=500) and when possible, compare to the ABUHB catchment area population, thus enabling discussion regarding the generalisability of findings to the wider population. Such data comparison is tabulated in Table 4.5.

Table 4.5 Characteristics of the Survey Sample Compared with the ABUHB Catchment Area Population

Characteristics of Participants Sampled		n	%	Mean	Characteristics of ABUHB Catchment Population	%	Mean
Gender	Male	257	51.4			48.7*	
	Female	230	46.0			51.3*	
	Total	487	97.4				
Age (years)		484	96.8	43.1			43.1*
Ethnicity	White British	450	90			96.5**	
	White (non-British)	27	5.4			0.92**	
	Black/African/Caribbean/Black British	5	1.0			0.53**	
	Asian/Asian British	10	2.0			1.46**	
	Mixed/multiple ethnic groups	7	1.4			0.48**	
	Total	499	99.8				
Marital status	Never married/never registered a same sex civil Partnership/a member of an unmarried couple	165	27.8			43**	
	Married/Same sex civil partnership/civil partnership	205	41.0			41**	
	Separated/divorced	4	9.8			9.0**	
	Widowed	9	4.4			7.0**	
	Would rather not say	31	6.2				
	Total	495	99.0				

* Plumplot (2018)

** Statistics for Wales (2020b)

4.2.6 Choice of Minor Injury Service

The following section will present the descriptive statistics reporting the frequencies involved in the choice of minor injury service, that is, how many of the participants chose an ED or an ENP led MIU for a minor injury service. The findings are summarised in Table 4.6 which shows more people demonstrated a preference for attending an ENP led MIU (66.4%) compared with a traditional ED (30.8%).

Table 4.6 Choice of Minor Injury Service: Frequencies

Choice of Minor Injury Service	n	%
Choose to Stay in ED for Minor Injury Service	154	30.8
Choose to Attend ENP led MIU for Minor Injury Service	332	66.4
Total	486	97.2

4.2.7 Reasons for Minor Injury Service Choice

Having presented the descriptive data regarding the choice of minor injury services, it was necessary to explore the underlying reasoning used to make such choices. Table 4.7 tabulates the frequencies involved in reasons for choosing an ED for a minor injury service, whilst Table 4.7 presents the same data for participants that's chose to attend an ENP led MIU.

The results suggest that the most common reason for choosing an ED for the treatment of a minor injury was being reassured by having access/ the option to see a doctor (37.21%) followed closely by not understanding the role of an ENP led MIU (31.39%).

Table 4.7 Reasons for Choosing an ED or ENP Led MIU for a Minor Injury Service

Reasons for Choosing ED For a Minor Injury Service	n	%	Reasons for Choosing an ENP led MIU for a Minor Injury Service	n	%
Does not understand the role of ENP led MIU	54	31.4	I trust that an ENP can assess and manage my injury	170	52.0
Reassured by having access/option To see a doctor	64	37.2	Waiting times are shorter in ENP led MIU	74	22.62
Waiting times are shorter in ED	5	2.88	Better facilities in ENP led MIU e.g. canteen/coffee shop/café	25	7.64
Does not have transport to travel to ENP led MIU	12	7.0	Minor injuries see as a lower priority in ED	40	12.2
Unable to afford the travel costs Associated with travelling to the ENP led MIU	5	2.9			
Car parking facilities are better at ED	3	1.7			
There are better facilities at ED e.g. canteen, coffee shop, café	11	6.4			
Total	173	89.48		327	94.5

Table 4.7 shows that the two most common reasons to choose ED for a minor injury service were that participants did not understand the role of the ENP (31.39%) or did not understand the role of an ENP led service, whilst 37.21% of participants reported that they were reassured by having access to a doctor.

Table 4.8 also shows that the two most common reasons to choose an ENP led MIU for a minor injury service were that participants trusted an ENP could assess and manage their minor injury (52%) the potential shorter waiting times (22.6%). These data shows that over half of the sample trusted the capabilities of the ENP.

4.3 Main Analysis

The following sections will present the results of the main analysis, which involves correlation and logistic regression testing. The study aimed to establish whether any demographic and/or socio-economic factors had the ability to predict a patient's choice of a minor injury service. To address such an aim Research Objective Two articulates the need to initially explore the correlation between the demographic/socio-economic variables and choice of minor injury service, namely between a traditional ED or an ENP led MIU.

Establishing statistically significant correlations between any demographic/socio-economic variables and choice of minor injury service enabled the identification of variables to be taken forward into the subsequent logistic regression analysis, which established the variables predictor capability. By reporting the results of the logistic regression enabled the fulfilment of Research Objective Three, namely exploring the ability of demographic and socio-economic characteristics to predict choice of minor injury service (see Fig 4.0). As well as being taken forward into the logistic regression analysis the same demographic and socio-economic variables were also taken forward to a second layer of correlation analysis. This involved exploring the relationship between the same variables and the reasons for minor injury service choice. By presenting such results it can be ascertained that requirements of Research Objective Four have been met (see Fig 4.0).

4.3.1 Correlation Analysis Between Demographic and Socio-economic Variables and Choice of Minor Injury Services

Research Objective Two
To explore the relationship between demographic and socio-economic characteristics and choice of minor injury service (ED versus ENP led MIU)

Research Objective Two involves exploring the relationship between demographic and socio-economic characteristics and choice of minor injury service. The following sections reports the results that fulfil such an objective.

4.3.1.1 Correlation Between Demographic Variables and Choice of Minor Injury Service

The following section will present the results of the correlation analysis between the demographics of gender, age, ethnicity, and choice of minor injury service. Table 4.8 tabulates the results.

Table 4.8 Correlation Between Demographics and Choice of Minor Injury Service

Demographic Variable	Choice of Minor Injury Service (ED versus ENP led MIU) (r value)
Gender	.400
Age	.4238*
Ethnicity	2.134

Key: Correlation coefficient r, *= significant correlation at p< 0.05%

4.3.1.1.1 Correlation Between Gender and Choice of Minor Injury Service

The correlation results ascertain that gender can be considered unrelated to patients’ choice of minor injury service and does not therefore influence a patient’s choice of minor injury service between a traditional ED and ENP led MIU. The lack of a statistically significant correlation between the variable of gender and minor injury service choice denotes a rejection of gender as a possible predictor variable in any future predictor model. The correlation analysis denoted that the variable of gender would not be included in the logistic regression analysis.

4.3.1.1.2 Correlation Between Age and Choice of Minor Injury Service

There was a positive association between age and choice of minor injury service, which was statistically significant; therefore we can ascertain that age and minor injury service choice are correlated. It appears participants who choose to remain in ED tended to fall into the younger age group (18 years to 32 years) (see Table 4.14).

One of the research aims was to explore the potential of demographic factors being able to predict choice of minor injury service. The statistically significant correlation between the variables of age and choice of minor injury service identified such a factor may play a role in a potential predictor model. Consequently, the variable of age was taken forward into the logistic regression analysis.

4.3.1.1.3 Correlation Between Ethnicity and Choice of Minor Injury Service Choice

Referring to the aims of the research, this result ascertains that the demographic variable of ethnicity can be considered unrelated to patients’ choice of minor injury service. The correlation between ethnicity and choice of minor injury service was not statistically

significant, so the variable of ethnicity as a possible predictor variable was rejected for inclusion in the logistic regression analysis.

4.3.2 Correlation Between Socio-Economic Variables and Choice of Minor Injury Service

The following section will present the results of the correlation analysis between the socio-economic variables of level of deprivation, ‘access value’, marital status, qualifications, number of people in household, health status and choice of minor injury service. Table 4.9 tabulates the results.

Table 4.9 Correlation of Socio-economic Variables and Choice of Minor Injury Service

Socio-economic Variable	Choice of Minor Injury Service (ED versus ENP led MIU) (r value)
Level of Deprivation	.035*
Access Value	.225
Marital Status	.119
Qualifications	-.125
People in Household	.004
Health Status	
Mobility	.059
Self-care	.760
Usual activities	2.848
Pain and discomfort	0.6
Anxiety and depression	.172

Key: Correlation coefficient r, *= significant correlation at p< 0.05%

4.3.2.1.1 Correlation Between Level of Deprivation and Choice of Minor Injury Service

The socio-economic variable of deprivation has a statistically significant correlation with patients’ choice of minor injury service between a traditional ED and ENP led MIU. Patients that were considered the most deprived (WIMD values = 1-764) tended to prefer an ENP led MIU rather than a traditional ED for the management of their minor injury. This analysis of correlation denoted that the variable of deprivation would be taken forward as a possible predictor variable and included in the logistic regression analysis.

4.3.2.1.2 Correlation Between Access Value and Choice of Minor Injury Service

Referring to the aims of the research, this result ascertains that the socio-economic variable of 'access value' does not have a statistically significant correlation with choice of minor injury service (ED versus ENP led MIU). The lack of relationship between the 'access value' variable and choice of minor injury service denotes a rejection of the 'access value' variable as a possible predictor variable in any future predictor model and therefore will not be considered in the logistic regression analysis.

4.3.2.1.3 Correlation Between Marital Status and Choice of Minor Injury Service

Referring to the aims of the research there was a non-significant correlation between choice of minor injury service (ED versus ENP led MIU) and the variable of marital status. This denotes a rejection of marital status as a possible predictor variable in any future predictor model. The correlation analysis denoted that the variable relating to marital status would not be included in the logistic regression analysis.

4.3.2.1.4 Correlation Between Qualifications and Choice of Minor Injury Service

Reflecting on the aims of the research the lack of a statistically significant correlation between the variable of marital status and choice of minor injury service denotes a rejection of marital status as a possible predictor variable in any future predictor model. The correlation analysis denoted that the variables of qualifications would not be included in the logistic regression analysis.

4.3.2.1.5 Correlation Between People in the Household and Choice of Minor Injury Service

Referring back to the aims of the research this result ascertains that the socio-economic variable of people in the household is considered statistically unrelated to patients' preference of minor injury service, and appears to have no influence on a patient's choice of minor injury service between a traditional ED and ENP led MIU. The lack of a relationship between the variable of people in the household and choice of service denotes a rejection of people in the household as a possible predictor variable in any future predictor model. Such analysis of correlation denoted that the variable of people in household would not be included in the logistic regression analysis.

4.3.2.1.6 Correlation Between Health Status and Choice of Minor Injury Service

Table 4.24 demonstrates that there is no statistically significant association with any of the health status variables and choice of minor injury service. Referring back to the aims of the

research, this result ascertains that the socio-economic variable of health status can be considered unrelated to patients' preference of minor injury service, and appears to have no influence on a patient's choice of minor injury service between a traditional ED and ENP led MIU. The lack of a relationship between the variables of health status and choice of minor injury service denotes a rejection of health status as a possible predictor variable in any future predictor model. Such analysis of correlation denoted that the variable of health status would not be included in the logistic regression analysis.

4.3.2.1.7 Variables Entered into Logistic Regression Analysis (Prediction Modelling Stage)

The results of the correlation analysis enabled the identification of possible predictor variables (with a statistically significant correlation with choice of minor injury service). Subsequently such variables were then entered into the logistic regression (prediction modelling stage) of the data analysis. This stage of data analysis endeavours to build a model able to predict choice of minor injury service using demographic and socio-economic factors. The possible predictor variables taken forward into the logistic regression analysis were:

- Age
- Level of deprivation

4.3.3 Logistic Regression Analysis of Age, Level of Deprivation, and the Choice of Minor Injury Service (ED or ENP led MIU)

Research Objective Three

To explore the ability of demographic and socio-economic characteristics to predict choice of minor injury service (ED versus ENP led MIU) and determine a prediction model

Research Objective Three involved exploring the ability of demographic and socio-economic characteristics to predict choice of minor injury service (ED versus ENP led MIU) and determine a prediction model. The following sections will present the stages of the logistic regression analysis and the results which fulfils Objective Three.

4.3.3.1 Multicollinearity Testing of Predictor Variables

Prior to conducting the logistic regression test it was necessary to ensure there was no multicollinearity between the two independent (predictor) variables of age and level of

deprivation. Multicollinearity describes two continuous variables that are very highly correlated. Ensuring the possible predictor (independent) variable did not have multicollinearity meets the assumption that each variable is statistically unique (Field 2009). Multicollinearity was checked by running the statistical test of Pearson correlation. A Pearson correlation coefficient either less than -.9 or greater than +.9 is considered evidence of multicollinearity. Table 4.10 presents the results for the multicollinearity analysis which shows that there is no correlation between age and level of deprivation. Such a result indicates that the assumption of no multicollinearity has been met.

Table 4.10 Multicollinearity Testing

Possible Predictor Variable	Age	Level of Deprivation
Age	1	.173
Level of deprivation	.173	1

Key: Correlation coefficient r , *= significant correlation at $p < 0.05\%$

4.3.3.2 Results of the Logistic Regression

Logistic regression was performed to evaluate the influence of possible predictor variables on the likelihood that participants would choose an ED or ENP led MIU for a minor injury service. Using the variables that had a positive correlation with choice of minor injury service the model contained the independent variables of age and level of deprivation.

The model row of the omnibus test of model coefficients table (Table 4.11) indicates a significance level $p < .05$ which means that the overall model was statistically significant. This implies at least one of the possible predictor variables (age and level of deprivation) is statistically significant in respect to predicting the choice of minor injury service. That is, the overall model was able to distinguish between participants who choose an ED or ENP led MIU for a minor injury choice. The model was also able to correctly predict 70% of cases.

Table 4.11 Omnibus Tests of Model Coefficients

	Chi-square	df	Significance
Step 1	12.246	2	.002*
Step	12.246	2	.002*
Block	12.246	2	.002*
Model	12.246	2	.002*

Key: Correlation coefficient r, *= significant correlation at p< 0.05%

The results shown in Table 4.12 describe the goodness of fit test, the results present the chi-square value of the Hosmer-Lemeshow Test. The value is 3.873 with a significance level of $p=.868$. Such a p value also supports the model’s ability to predict the choice of minor injury service (Pallant 2013).

Table 4.12 Hosmer-Lemeshow Goodness of Fit Test

Chi-square	df	Significance
3.873	8	.868

Having established that the model was statistically significant and an acceptable sensitivity the next stage was to present the results of the logistic regression.

Table 4.13 Logistic Regression Predicting Likelihood of Choosing an ED or ENP led MIU for Minor Injury Service Choice Based on Age and Level of Deprivation

	B	S.E	Wald	df	Sig.	Exp (B)	95.0% C.I. for Odds Ratio	
							Lower	Upper
Age	.012	.006	3.477	1	.043	1.012	1.011	1.065
Level of Deprivation	.096	.037	6.548	1	.011	1.100	1.023	1.184

Table 4.13 tabulates the essential findings of the logistic regression analysis. The results demonstrate both age and level of deprivation made a statistically significant contribution to the model. This is evident from the Wald test values associated with a p value < .05. The Wald test provides information about the contribution or predictive ability of each independent (predictor) variable (Pallant 2013).

The Exp (B) value found in Table 4.13 indicates the odds ratio (OR) for each independent (predictor) variable, that is *'the changes in odds of being in one of the categories of outcome when the value of a predictor increases by one unit'* (Tabachnick and Fidell (2013)). Continuous variables are best expressed in terms of odd percentages (Sage 2017). If the Exp(B) value is greater than 1, as is the case with the variable of age and level of deprivation, an increase in the odds percentage can be ascertained per year of age and per level of deprivation according to the WIMD. The equation $(\text{Exp (B)} - 1) \times 100$ was used to calculate the odds percentage for each year of age and each level of deprivation. For every year of age, the odds of choosing an ENP led MIU minor injury service increases by 1.2% (95% CI 1.011 – 1.024). As the confidence interval (CI) did not contain the value of 1 the odds ratio (Exp B) or odds percentage was deemed statistically significant. For every level of deprivation, the odds of choosing an ENP led minor injury service increased by 10%.

In summary such results indicate that younger patients are more likely to use ED for the treatment of their minor injury, which equates to the older patients being more likely to choose the services of an ENP led MIU. The results also indicate patients living in areas with a higher level of deprivation are more likely to choose an ENP led MIU rather than an ED for a minor injury service, whilst patients from lower levels of deprivation are more inclined to use an ED for a minor injury service. In essence, it was possible to build a model predicting the likelihood of choosing an ED or ENP led MIU for a minor injury service using the demographic factor of age and the socio-economic factor of level of deprivation (WIMD).

4.3.4 Correlation Analysis between Age, Level of Deprivation and Reasons for Minor Injury Service Choice

Research Objective Four

To explore the relationship between demographic and socio-economic characteristics and the underpinning reasons and motivation behind the choice of minor injury service (ED versus ENP led MIU)

Research Objective Four involves exploring the relationship between demographic and socio-economic characteristics and the reasons behind choice of minor injury service. The following sections reports the results that fulfil such an objective.

The research also aimed to examine the reasons behind the choice of minor injury service (ED versus ENP led MIU), thus providing more understanding about the ‘why’ behind such choice. To accomplish such an aim Research Objective Four involved exploring the relationship of the demographic and socio-economic variables found to have a correlation with choice of minor injury service, and how they correlated with reasons for choice (age and level of deprivation). Research Objective Four was achieved by running a correlation analysis between the variables of age and level of deprivation and reasons for choice. Table 4.14 presents the results.

The results indicated no correlation between level of deprivation and reasons for choosing an ED or ENP led MIU for the treatment of a minor injury. However, the correlation coefficient was statistically significant when considering the relationship between age and reasons for attending an ENP led MIU. That is, that the younger age group (18-32 years) preferred to attend an ENP led MIU due to the shorter waiting times and the older participants chose an ENP led MIU due to trusting the capabilities. The younger participants also preferred to attend an ED for a minor injury service as they were reassured by having access/the option to see a doctor.

Table 4.14 Correlation Between Age, Level of Deprivation and Reasons for Choice of Minor Injury Service

Variable	Reasons for Choosing ED for a Minor Injury Service (r value)	Reasons for Choosing an ENP led MIU for a Minor Injury Service (r value)
Age	54.764	44.90*
Level of Deprivation	54.764	586.265

Key: Correlation coefficient r, *= significant correlation at p< 0.05%

Table 4.14 presents the findings of the correlation analysis associated with the socio-economic variables and the reasons for minor injury service choice (ED versus ENP led MIU). The correlation analysis of the socio-economic variables and reasons for choosing a minor injury service (ED or ENP led MIU) resulted in no statistically significant relationships.

4.4 Chapter Summary

The chapter began by presenting the descriptive statistics regarding the methodological aspects of the study. The chapter then presented the descriptive data which articulated the generalisability of the results to the local population, thus achieving research objective one.

In an endeavour to achieve Research Objective Two, the chapter progressed to the main analysis, which involved presenting the results of the correlation analysis of the demographic and socio-economic variables with patient choice of minor injury service (ED versus ENP led MIU). The results of such correlation analysis found that the demographic variable of age and the socio-economic variable of level of deprivation demonstrated a statistically significant correlation with choice of minor injury service. The results demonstrated that younger patients were more likely to choose an ED for the treatment of a minor injury whilst the older age groups were more likely to choose an ENP led MIU. A statistically significant correlation was also found between level of deprivation and the choice of minor injury service, with patients falling in the most deprived categories choosing to attend an ENP led MIU and least deprived patients choosing to attend a traditional ED. As a result of the correlation analysis the variables of age and level of deprivation were taken forward into the subsequent level of analysis, that being logistic regression.

To achieve Research Objective Three, the chapter then progressed to consider the results of logistic regression to ascertain whether age and level of deprivation contributed to a model able to predict patient choice of minor injury service. The results of the logistic regression analysis suggested that a predictor model was possible using the variables of age and level of deprivation. The results signified the ability to predict that younger patients would be more likely to use a traditional ED for treatment of a minor injury. It was also found that patients from areas with higher levels of deprivation were more likely to use an ENP led MIU for a minor injury service choice.

Finally, in relation to the reasons for choosing an ED or ENP led MIU for a minor injury service the only significant correlation was between age, these data satisfied Research Objective Four. It was found that the younger age group tended to choose an ENP led MIU for a minor injury service due to the potential for shorter waiting times, whilst they tended to attend an ED for a minor injury service because they were reassured by having

access/the option to see a doctor. The older patients would attend an ENP led MIU as they trusted that an ENP could assess and manage their injury.

Chapter 5 Discussion of Findings

5.1 Introduction

The chapter will begin by discussing the descriptive data and how the findings relate to the generalisability of the study. The findings will then be discussed in relation to relevant existing research and literature. The chapter will continue by discussing the findings and their implication upon reconfiguration of emergency care services, with a focus on the establishment of ENP led MIUs in lieu of a traditional ED. Following on from this discussion a suite of recommendations will then be outlined and summarised. Finally, the limitations and challenges of the study will be summarised and discussed.

5.2 Generalisability of the Findings

The following section will discuss the findings of the descriptive data in relation to the generalisability of the survey sample. This will involve establishing whether the demographic, socio-economic and clinical profile of the sample enable transferability of the findings to the local populations.

The descriptive data in relation to the demographic characteristics of gender and age articulated in the study sample was comparable to the wider ED population (patients who attended ED during the data collection period but where not recruited). In relation to gender and age the study sample was also comparable to the catchment area population statistics.

The descriptive data in relation to the demographic of ethnicity found the study sample was comparable to the local population statistics. The sample was predominately made up of white British participants which reflects the ethnicity profile of the local catchment area (Office of National Statistics 2011). The survey sample was echoed by the local population statistics regarding Asian and black/African/Caribbean/black British ethnic groups (Office of National Statistics 2011). Such comparable data suggest the survey sample can be considered representative of the local population regarding ethnic profile. The current patient management software in the research setting was unable to collate information regarding ethnicity; as a result, the study was unable to compare ethnic profile to the wider ED population.

The socio-economic profile of the study sample compared favourably with local population statistics. In relation to deprivation the mean WIMD value of the study sample fell into the middle range of the ED catchment area, giving credence to the sample being representative of the local population in terms of deprivation. The study sample was also comparable to local population statistics regarding marital status, qualifications, number of people in the household and employment, adding further credibility to the generalisability of the sample.

The study sample included patients with a wide variety of clinical presentations. It was noteworthy that the most common presentation in both the wider ED population (non-sampled) and the survey sample matched, was a limb injury/problem. Head injury was the second most common presentation in both the study sample and the wider ED population (non-sampled). Subsequently, the study sample is generalisable in term of clinical presentation. It was also worth noting that the largest percentage of clinical presentations of the wider ED population (non-sampled) were recorded as 'other'. Such patients would have presented to the ED triage; however, after triage assessment they would have been considered to be outside the remit of an MIU and either redirected to other services e.g. primary care, out of hours primary care, pharmacy, dentist or transferred to an area of ED appropriate for the care of higher acuity patients e.g. resuscitation or major's area. The group of conditions classified as 'other' would be excluded from this study.

The percentage of the sample that had engaged with ED services prior to their current attendance was comparable with statistics regarding the use of ED departments across Wales. Such data indicates 790,000 people used Welsh ED departments in the year of 2016 which accounts for 27% of the total population (Baker 2017). This adds credence to the sample being representative of the population.

Essentially, the demographic, socio-economic and clinical variables of the survey sample compared favourably when judged against the wider ED population and local statistics. This equated to the study sample having robust generalisability to the local community. Fig 5.0 summarises the variables representative of the local population. Considering such findings, it can be ascertained that the descriptive data analysis has generated findings meeting the Research Objective One of describing the demographic and socio-economic characteristics of the population presenting at ED with a minor injury (see Fig 4.0).

Table 5.0 Variables Representative of the Local Population

Variables Representative of the Local Population
Marital status
Qualifications
People in household
Employment
Clinical presentation
Previous use of ED

5.3 Discussion of Findings Against Previously Published Evidence

To ascertain how the findings of the research builds upon the current knowledge base the following section will reflect on the findings and compare them with existing evidence. As articulated in the literature review there were no studies exploring patient choice in relation to ED or ENP led minor injury services. Therefore, the following discussion will compare the findings with published evidence investigating similar phenomena, such as choice and preference of emergency care services for non-urgent conditions, such as a minor injury.

5.3.1 Choice of Minor Injury Service

The primary aim of this study was to explore the choice of minor injury service (ED versus ENP led MIU) in individuals attending an ED with a minor injury. Such a choice was investigated by providing the participants with a hypothetical scenario, where they were given the option of staying in ED for the treatment of a minor injury or alternatively attending an ENP led MIU, this response represented the dependent variable. The study then asked a follow up question exploring the rationale for the choice, adding an extra layer of contextual knowledge. The following section will discuss the data associated with the variables of choice of minor injury service and the reasons for such a choice. Where possible the findings will be compared with existing literature.

The descriptive statistics indicated more participants would choose to attend an ENP led MIU if given the choice between a traditional ED and an ENP led MIU. However, 30.8% of the survey sample would still prefer to use a traditional ED for the treatment of their minor injury, which could be considered a significant number. The study also found the most

common reason for choosing an ED for a minor injury service is being reassured by having access/the option to see a doctor. The second most common reason for choosing an ED was 'not understanding the role of the ENP'. This suggests that many participants perceive that ED delivers a superior minor injury service in terms of clinical expertise (e.g. doctor versus ENP). These findings are important for several reasons; firstly, the findings suggest that patients will still attend ED with a minor injury despite some EDs not providing a minor injury service. Secondly, some patients continue to attend ED with conditions that could be managed elsewhere, which continues to place pressure on already overcrowded EDs.

Such findings are echoed by existing evidence which suggests that although some patients appreciate alternative services to those provided by ED (such as an ENP led MIU) some still perceive ED as a panacea to all healthcare problems and believe that ED is the only service that can effectively manage their health needs (MacKichan et al 2017, Langer et al 2013, Craker 2014, Lobachova et al 2014, Agarwal et al 2012, Nelson 2011, Moll van Charante et al 2007, Afilalo et al 2004). Mackichan et al (2017), in an ethnographic exploration of access to general practice, found that patients seeking care at the ED frequently doubted primary cares ability to respond to 'urgent' problems. The idea of ED being a 'magic bullet' for healthcare provision is also summarised by Kraaijvanger et al (2016) in a systematic review of patients' motives for self-referral to the ED. The review found that the two most common motives for attending ED involved patients worrying about the severity of their injury or illness and expectation that they would require further investigations (e.g. x-rays, bloods), which they felt could only be provided in an ED. The review suggests patients may not be best positioned to judge the severity of their condition and may perceive non-urgent symptoms as urgent. This may go some way to explaining why, given a choice of a minor injury service, some may believe that ED is better positioned to access senior decisions makers, investigations, technology, and speciality care.

The findings of this present study can also be explained by the arguments proposed in a paper by Saunders (2000). The paper presented the results of a systematic review into health professional attitudes and patient perceptions in 'inappropriate' ED attendances and the implications for current minor injury service provision in England and Wales. The review advocates policy and services assume patients can distinguish between an emergency and a minor injury. Saunders (2000) implies this may be an unreasonable assumption, especially when health professionals themselves frequently disagree regarding

the appropriateness of attendance. Pope et al (2018) add credence to this argument in a study using semi-structured interviews to explore how people make sense of UK urgent care provision. The paper describes how patients are frequently confused by the ill-defined boundaries between emergency care services (e.g. ED and ENP led MIU) which may account for why people have difficulty navigating urgent care services. Pope et al (2018) argue for a deeper analysis of patients 'sense making' and a shift of attention to understand a patient choice of emergency care pathways. It can be argued that the findings of this present study respond to Pope et al (2018) and go some way to reshaping current understanding of patient choice behaviour and promote the importance of educating and supporting patients when navigating minor injury service options.

Although the findings echo existing evidence, it is noteworthy that this study has provided a unique focus upon minor injury services. Most of the existing discussion and analysis involve examining choice of emergency care services for the treatment of non-urgent or primary care conditions. This study has acknowledged the lack of existing research investigating patient choice of minor injury service and has produced novel findings which articulate patients' choice behaviour. Such findings have the ability to inform commissioners of emergency care reconfiguration and researchers working in this field that it would be unwise to assume all patients will 'fall into line' and engage with ENP led MIUs.

5.3.2 Demographic and Socio-economic Factors that May Predict Choice of Minor Injury Service

The following section will discuss how the socio-economic and demographic variables correlate with choice of minor injury service and the rationale for such choices. The findings of the logistic analysis will also be reviewed and discussed in relation to their ability to predict choice of service. Such findings will be discussed and where possible, compared with existing, relevant literature.

The secondary aim of this study was to identify demographic and socio-economic factors that predict choice of minor injury service. It was the intention of the study to build a model of socio-economic and demographic variables able to predict patients' choice of minor injury service, between a traditional ED or an ENP led MIU. The ability to predict choice of service was investigated by collating information regarding the demographic and socio-economic profile of each respondent. Correlation analysis was then conducted to

investigate the relationship between the demographic and socio-economic variables and the choice of minor injury service. The variables demonstrating a statistically significant correlation with choice of service were considered as potential predictor variables to be included in a possible predictor model. Logistic regression was conducted to explore the possibility of creating a model that would enable prediction of minor injury service choice. Exploration of the data also allowed the investigation of correlation between the same demographic and socio-economic variables and the reasons behind such choice decisions, generating an extra layer of understanding which will be discussed in the following section.

5.3.2.1 Gender

Analysis of the data found no relationship or correlation between gender and the choice of minor injury service; consequently, gender was rejected as a predictor variable. However, two studies were identified examining the influence of gender on choice of emergency care service for non-urgent conditions (Siminski et al 2008, Maclean et al 1999). Both papers found that gender did not play a role in influencing the choice of emergency care service for a non-urgent condition. Consequently, the findings of this study support this small body of research and add strength to the postulation that gender does not correlate with or predict preference of emergency care service for a non-urgent presentation, such as a minor injury.

5.3.2.2 Age

The findings denote younger participants preferred the use of a traditional ED for the management of a minor injury, conversely, as age increased the tendency was to choose an ENP led MIU. The findings suggest that for every year of age, the odds of choosing an ENP led MIU increase by 1.2%. It was also found that if patients in the younger age group (18-32 years) chose to attend an ENP led MIU this was frequently due to the shorter waiting times. Patients over 50 years chose an ENP led MIU as they had greater trust in the clinical capabilities of an ENP. This suggested that the younger age group was less accepting of a service delivered by a non-doctor workforce.

It was evident that the results of this study echo the findings of a significant body of evidence which advocates younger adults preferring ED for non-urgent conditions (Unwin et al 2016, Citizens Advice 2014, Williams and Khalid 2014, Siminski et al 2008, Carrett et al 2007, Gerard et al 2004, Rajipar et al 2000). A Citizens Advice report (2014) found people aged 18-34 years were more than twice as likely to attend ED with a non-urgent condition,

such as a minor injury, compared with other age groups. Although the report focuses upon the use of ED as an alternative to a GP, rather than an MIU, the findings still resonate with this study. The findings generated by this present study also reflect a UK cross-sectional survey conducted by Unwin et al (2016) who found 15-24 year-olds had a preference for accessing ED for minor ailments. This is also mirrored by Rajipar et al (2000) in a study investigating choice between EDs and general practice centres for out of hours non-urgent problems. Rajipar et al (2000) found that the 21-40 years age group accounted for the largest group of patients using the ED instead of out of hours GP services for non-urgent presentations.

In a systematic review of the literature exploring why people choose emergency and urgent care services, Coster et al (2017) suggest that younger adults are less satisfied with services that deal with non-urgent conditions (e.g. GP, walk-in-centres) and subsequently turn to ED where they believe they will receive a superior service (e.g. be able to access senior clinicians). Such findings are mirrored in this study, with the younger age group suggesting that they would prefer to attend ED as they do not understand the role of the ENP and would prefer to have access to a doctor. Although a noteworthy finding, it is worth asking why younger people may be dissatisfied with services delivered by non-doctors. Sturgeon (2014) postulates it may be related to the development of consumerism within the NHS. The paper describes how since the 1980s, successive governments have supported service users to view themselves as consumers of healthcare services rather than passive recipients, resulting in a stronger consumer culture within the NHS. Sturgeon (2014) suggests that such a culture has promoted greater choice and raised expectations among the public regarding the standard and range of healthcare services. It can therefore perhaps be suggested that younger people are more familiar with the notion of consumerism in the NHS, compared with the older generation who may be more accepting of services. Such consumerism may explain why some patients may wish to use an ED for a minor injury when alternative ENP led MIUs are available. That is, they believe they have a choice about when and where to access minor injury care.

Gerard et al (2004) underlines the importance of carefully considering the planning and implementation of non-doctor led services (such as an ENP led MIUs). Gerard et al (2004) advocates the need to ensure service users understand how the use of a non-doctor workforce will not equate to a deterioration in quality and safety of care, a concept

reflected by a large body of existing evidence (Swain et al 2012, Carter and Chochinov 2007, Cooper et al 2002). The findings of this study address the recommendations proposed by Gerard et al (2004) and suggest future communication and awareness campaigns encouraging the use of ENP led MIUs should focus on the younger age group. In addition, the messages aimed at such a demographic should be advertising the ability of ENP led MIUs to deliver a quality of service, equal to that provided by doctors. By providing information and evidence demystifying the notion that emergency care services delivered by non-doctors are suboptimal, the younger age groups will be encouraged to consider the use of an ENP led MIU for the treatment of minor injuries. As the literature suggests, patient satisfaction is high in relation to the care delivered by ENPs (Jennings et al 2015, Dinh et al 2012). This would suggest if younger patients experience care provided by an ENP led MIU then satisfaction levels would likely be high, which would encourage future service utilisation. This is endorsed by Rajpar et al (2000) who found that once patients had used GP Out of Hours (OOHs) they were more likely to use the service again, rather than attend ED.

In addition to trusting a non-doctor workforce, the study findings suggest the younger people who express a preference for using an ENP led MIU do so for the potential shorter waiting times. Such findings mirror the work of Grafstein et al (2013) who explored factors influencing patients' choices when selecting an ED for ambulatory care. Grafstein et al (2013) found that when deciding upon an emergency care service younger people favoured shorter waiting times, whilst older people had a greater acceptance of longer waiting times; such observations echo the findings of this study. It could be argued that younger patients prefer shorter waiting times; linked to lifestyle factors (e.g. childcare, demands of employment) however, the existing literature failed to provide a rationale for why younger people prefer shorter waiting times. This suggests an area requiring further exploration.

5.3.2.3 Ethnicity

The findings found no correlation between ethnicity and the choice of a minor injury service. Therefore, the variable of ethnicity was not considered a possible predictor variable.

On reviewing the literature in relation to emergency care services for non-urgent conditions, a small body of literature was evident that discussed the relationship with ethnicity. In contrast to the current study, existing evidence concluded that white groups

more frequently use ED for the treatment of non-urgent conditions in comparison with other ethnic groups (Hull et al 1998, Baker et al 2011, Rajpar et al 2000). However, comparing study findings with the current evidence is problematic, as much of the existing evidence exploring ethnicity and use of ED for non-urgent conditions has been conducted in geographical locations with a greater proportion of non-white ethnic groups (e.g. inner London) (Brown et al 2011).

The issue of transferability of findings to other geographical areas with differing ethnic profiles is reflected by Scantlebury et al (2015), in a cross-sectional analysis of socio-economic deprivation and ED attendances. This paper discusses how exploration of ethnicity and the use of emergency care services is challenging due to local differences in proportions of ethnic groups in study populations. Scantlebury et al (2015) conclude that exploring ethnicity and emergency service use for non-urgent conditions is dependent upon the ethnic profile of the population under scrutiny and the replication of findings can be questionable. This is also echoed by a US study by Brown et al (2011) in a cross-sectional survey design which examined the effect of socio-economic status, demographics and health status on choice of emergency care service. Unlike the findings of this current study Brown et al (2011) found that Afro-Americans were twice as likely to use ED for minor ailments; however, 58% of the sample were classified as Afro-American which is intrinsically different compared with the ethnicity profile of this study sample. It is also worth noting the difficulty of comparing findings due to the differing healthcare systems in the US (primarily based on insurance) and the UK (funded by taxation).

Cowling et al (2013) in a cross-sectional, population-based study attempted to address the issue of generalisability and ethnic groups. The study explored how access to primary care influenced the attendance at ED with non-urgent presentations; the study addressed the issue of generalisability by using a national sampling strategy which studied areas of differing ethnic composition.

This study was conducted in a geographical area with a high proportion of white British ethnic groups (94%) (Office of National Statistics 2011) accounting for 90 % of the study sample being white British. Considering such an ethnicity profile, it was unlikely the findings were going to be significant regarding the correlation between ethnicity and choice of minor injury service and reasons for choice. Consequently, it can be argued that the findings of this study may not fully represent the ethnic groups that make up the

catchment area and future exploration and dialogue is required with other ethnic groups before robust conclusions can be drawn.

5.3.2.4 Level of Deprivation

Analysis of the data found a statistically significant correlation between level of deprivation and the choice of minor injury service; consequently, it was considered as a possible predictor variable. The results of the logistic regression indicated patients in groups with lower levels of deprivation were more likely to use ED for a minor injury service.

Conversely, patients from areas with higher levels of deprivation were more likely to seek the services of an ENP led MIU. Essentially, the results found that each level of deprivation (according to the WIMD) equated to a 10% increased chance of choosing an ENP led MIU. The findings did not suggest any statistically significant correlation between level of deprivation and the reasons for choice of minor injury service.

The principal message from existing evidence suggests that patients in areas of lower deprivation were more likely to use emergency care services for non-urgent conditions (such as a minor injury). This was reflected in a study exploring the socio-economic determinates of patients using ED and NHS Direct services (telephone advice line) (Shah and Cook 2005). The research analysed data from the 2004-2005 British General Household survey and compared the details to ED attendance and use of NHS Direct. The study found patients with lower incomes and working in unskilled manual jobs were more likely to use ED for non-urgent conditions. In a US study, Kangovi et al (2013) endeavoured to understand why patients of low socio-economic status prefer accessing hospital for minor ailments rather than their family doctor. This qualitative study found that patients in the more deprived groups were more likely to use hospital services (such as ED) due to ease of access (e.g. location and transportation), perceived trust in the technical quality of ED clinicians and the convenience of service (e.g. access to appointments, surgery opening hours). Such findings resonate with the commentary of similar UK studies (Scantlebury et al 2015, Shah and Cook 2005, Beattie et al 2001, Carlisle et al 1998). However, despite current evidence proposing patients from areas of higher deprivation are more likely to use EDs for non-urgent presentations, the findings of this study produced contrasting results. That is, people with lower levels of deprivation chose an ED for a minor injury service instead of an ENP led MIU. The reasons for such a finding are not clear and would require further investigation.

5.3.2.5 Access Value

The 'access variable' did not correlate with minor injury service choice; consequently, it was not considered a possible predictor variable.

Despite the limited evidence utilising a specific access value, a body of research exists exploring the impact of some of the variable's component parts (e.g. cost of travel, travel time and money spent whilst in ED). The evidence exploring the constituent parts of the 'access value' variable demonstrates a lack of consensus. Some studies find a positive correlation with travel cost and travel time (Cowling et al 2013, Baker et al 2011, Mungall 2005, Gill and Riley 1996, McKee et al 1990); that is, patients were more likely to use ED for non-urgent conditions if they were closer to their home and travel costs were low. Other papers found no relationship (Hendry et al 2005, Carlisle et al 1998). The findings of this research add to the ambiguity of such evidence.

By exploring the influence of 'access value' on choice of minor injury service this study has produced credible data regarding some aspects of economic burden. This resonates with a body of literature that argues reconfiguration and centralisation of ED services needs to acknowledge the implication of 'economic burden' on individual patients (Clarke and Rozansky 2013, Barratt et al 2015, Independent Reconfiguration Panel 2010, Boyce and Steer 2008). However, there is currently a lack of evidence that develops this notion and translates it into tangible evidence.

5.3.2.6 Marital Status

The study found no correlation between marital status and choice of minor injury service. and subsequently the variable was not considered a possible predictor variable.

Only one US paper was found exploring the impact of marital status on how patients seek emergency care for non-urgent conditions (MacLean et al 1999). This lone paper found that single and divorced patients were more likely to attend EDs for non-urgent conditions compared with patients who were married. Unfortunately the paper was unable to explain this behaviour. Although the paper was not specifically exploring the relationship between marital status and choice of minor injury service, such findings are in contrast with the current study.

5.3.2.7 Qualifications

The study found the qualification variable demonstrated no correlation with choice of minor injury service and was not considered a possible predictor variable. Such findings reflect the conclusions of Brown et al (2011); however they are in contrast with a Brazilian study conducted by Carett et al (2007) which found patients with a higher level of education are more likely to choose an ED for treatment of a non-urgent condition.

5.3.2.8 Number of People in Household

The study found that the number of people in a patients's household demonstrated no statistically significant correlation with minor injury service choice and was consequently rejected as a possible predictor variable. As the current literature fails to investigate the influence of people in the household on the choice of minor injury service or emergency care service for a non-urgent condition comparison with other evidence was not possible.

5.3.2.9 Health Status

The study found that health status demonstrated no correlation with choice of minor injury service and was consequently rejected as a possible predictor variable. As the current literature fails to investigate the influence of health status on the choice of minor injury service or emergency care service for a non-urgent condition comparison with existing evidence was not possible.

5.3.2.10 Summary

In summary, the findings of this study have responded to the gap in the existing evidence, that being limited investigation of patients' choice of a minor injury service (ED versus ENP led MIU).

The finding that younger patients prefer to access an ED for a minor injury service is replicated in the literature exploring use of ED for non-urgent conditions. Such literature suggests that younger patients have greater trust in the services provided by a doctor workforce in a traditional ED. The finding that patients from areas of lower levels of deprivation would choose to attend ED for a minor injury service contradicts the existing literature which suggests that it is in fact patients from areas with higher levels of deprivation that have a tendency to prefer utilisation of ED for the treatment of non-urgent conditions instead of using alternative services such as primary care.

5.4 Implications of Findings on Reconfiguration of Emergency Care Services

Government policy and guidance dictates that future reconfiguration of emergency care services should consider diversification of services, including the development of ENP led MIUs (NHS Wales 2014, NHS England 2013a). However, despite such recommendations, the findings of this study confirm that service reconfiguration necessitates acknowledgment of the local context and that not all groups in the community will choose services in the same way and for the same reasons. The findings of this study therefore suggest that redesign of emergency care services, in response to increasing demands upon EDs, should be mindful of the 'quick fix' approach. The findings propose that any healthcare service reconfiguration is often condemned to failure if the concept of patient choice behaviour is not meaningfully considered.

The notion that different groups of the community will exhibit different choice behaviours is reflected in the findings of this study. Such findings articulate that not all age groups and levels of deprivation will passively accept the services of an ENP led MIU. Such findings also argue that younger patients may not necessarily have faith in ENP led MIU services but may choose to use such services due to the comparatively shorter waiting times compared with an ED. Such conclusions imply it may be unwise for any local emergency care service reconfiguration plans to assume patients will all choose minor injury services in a similar manner.

Such findings address and recognise the complex nature of patient choice when deciding upon a minor injury service. The existing literature exploring reconfiguration of healthcare services also supports such a notion and suggests the delivery of healthcare services is more than a just an acceptance of a linear system. That is, if you introduce a new service then the public will not habitually accept the perceived benefits. Fitzgerald et al (2002) argue that although some policy makers and service commissioners consider healthcare reconfiguration to be the panacea to problems in service delivery, there is a need to acknowledge that not all patients will be passive 'adopters' of a change in service.

Several authors argue that local decision makers involved in healthcare redesign need to have the ability to predict how patients may respond to service reconfiguration. Such arguments claim that understanding the variation of choice behaviour and the rationale for such preferences will enable a forecast of patient responses and enable targeted communication and engagement strategies (Turner et al 2014, Gerard et al 2004, Williams

and Khaladi 2014). Williams and Khaladi (2014) maintain the need to investigate choice patterns of the local population, to generate more meaningful data and understanding of how and why patients choose a healthcare service. The authors contend that such knowledge will enable targeted attempts at behaviour change, aimed at specific groups of the population. Dalton et al (2016) adds credence to this argument in a systematic review about public engagement in health service reconfiguration. The paper maintains that successful service redesign relies upon deliberative methods of patient engagement, targeting when necessary, different population groups. The findings of the study advocate that any public engagement and communication strategy needs to be mindful of the concept 'one size doesn't fit all' (Chapman 2004). The findings of this study recognise such an argument and support the notion that any attempt to engage and communicate with the public regarding the change in service needs to consider the impact of patient demographic and socio-economic characteristics on choice of service. The findings have also added an additional layer of understanding by exploring how the predictor demographic and socio-economic variables are correlated with the reasons behind choice of minor injury service. Such findings provide additional information regarding specific targeted messages and 'attractors' requiring integration into any engagement and communication strategies (e.g. shorter waiting times and clinical competence of an ENP). Being able to predict which demographic and socio-economic groups are more likely to prefer the use of a traditional ED rather than an ENP led MIU enables a more focused communication strategy, which looks at directing communication at such a demographic and socio-economic group. It can be argued that such targeted and focused strategies will assist the successful introduction of ENP led MIUs when diversification of emergency care services occur. It can also be contended that such a targeted advertising approach ensures a more prudent use of relevant resources (e.g. advertising expenditure) (Bevan Commission 2013), whilst potentially producing more tangible results.

A communication campaign resonating with the findings of this study is documented in a study by Nan (2011), which investigates how targeted communication with younger adults (18-26 year-olds) can increase the uptake of the human papillomavirus vaccination (HPV). The study investigated the influence on message framing (gain versus loss) on the intentions of the younger adults (18-26 year-olds) to receive the HPV vaccination. The study supports the notion of a targeted communication and advertising campaign aimed at

younger adults and highlights the importance of the conveyed messages within such a targeted advertising campaign. The study found that if the message aimed at younger adults was framed around 'loss' (consequences of not getting the vaccine) rather than gain (benefits gained from vaccine), then the younger adult was more likely to seek out having the vaccine.

The study endeavoured to find an example of a documented healthcare campaign specially targeted at patients from an area of lower deprivation. However, a search of the literature failed to identify any examples of when this has occurred. Consequently, this appears to represent a gap in the literature or a suggestion that healthcare campaigns are not routinely aimed at such a socio-economic group.

Despite the study findings signifying the need for a targeted patient engagement and communication strategy regarding healthcare reconfiguration, it can be argued there is a dearth of literature documenting such a pursuit. This is of concern when emergency care reconfiguration can prompt significant public controversy and opposition (Barratt 2012, Farrington-Douglas and Brooks 2007). Essentially, a disconnect endures between existing recommendations regarding best practice, the implementation of health service reconfiguration and the research agenda (Barratt et al 2015, Barratt and Raine 2012). In response to such discourse, it can be argued that findings of this study respond to the paucity of evidence and disconnect between policy recommendations, practice, and the research agenda.

In previous narrative, the study has suggested that the work is valuable in developing a more robust marketing strategy, aiming to increase the awareness and utilisation of ENP led MIUs. The study has also highlighted the importance of the findings in the of Co-production of healthcare reconfiguration. On reflection, it is important to clarify how the term 'co-production' relates to the findings and recommendations of this study.

It is important to note that the aims, objectives and subsequent results of this study are focused upon the 'co-production' of an effective marketing strategy, rather than co-production of a new emergency care service. It has been established that the findings of this study enabled a targeted marketing strategy focused on raising awareness of ENP led MIUs. Having identified that any awareness campaign would benefit from focusing on younger adults and people from areas of lower deprivation, it can be proposed that such

groups should be approached to help co-produce any potential related marketing strategy or resources.

It is proposed that the need to 'Co-produce' a marketing strategy, encouraging the use of an ENP led MIU, reflects the principles of 'Prudent Health Care'. Such principles are outlined in the Welsh policy document 'Prudent Healthcare: Securing Health and Well-being for Future Generations' (Bevan Commission 2016) which reflects the Welsh context of this study. Prudent Health care commenced in 2013 with the Bevan commission submitting a report to the Minister for Health and Social Services named 'Simply Prudent Health Care'. The report reflected on how Wales could make the most effective use of the available resources to deliver consistent and high quality health and social care (Bevan Commission 2016). The co-production of marketing strategies align with the Prudent Healthcare principle of 'empowering and enabling' the public to be co-producers of healthcare interventions. Such interventions may include marketing approaches to better inform the public about the reconfiguration of health services. Co-production will help to ensure inclusivity, which enables getting the marketing strategy right first time , thus making best use of increasingly finite resources.

The findings generated by this study can also be utilised to influence macro-level policy to ensure that reconfiguration of health care services utilise patient-facing research to enable robust understanding of choice and reasoning. Max Planck (in Chapman 2004) claims that a 'new scientific truth' (in this case, a new minor injury service) does not succeed by persuading its opponents and 'making them see the light'.

Such an argument resonates with the findings of this study which contends that healthcare service reconfiguration should rely upon co-evolution and co-production between national-policy, local service commissioners and ultimately the patients that use the service, which in turn produces a generation of patients who become familiar with a new service (such as a ENP led MIU). Sturgeon (2014) argues that policy and the reality of healthcare reconfiguration can frequently be at odds. That is, policy recommends robust patient engagement and communication, yet lacks sufficient detail about how this can be achieved. Subsequently it can be argued that rather than changing policy regarding reconfiguration, the findings of the study have helped to straddle the disconnect between what policy may recommend and the reality of practice. Fundamentally, reconfiguration policy may reduce potential public conflict and dissatisfaction by promoting methodologies

that explore and predict patient choice of service, especially prior to the introduction of a those conducted new model of service (Dixon-Fyle et al 2012).

In summary, the findings of the study advocate that any local patient engagement and communication strategy employed to encourage utilisation of an ENP led MIU would need to be aimed at the younger age group and those patients from areas of lower deprivation. As well as aiming at such population groups, the strategy would need to be mindful of meaningful 'hooks' that may also improve the focus of any conveyed message. The findings indicate this would involve highlighting the potential shorter waiting times and the clinical competence of the ENP workforce, with a specific spotlight on the younger stakeholders. In addition, the findings have also suggested that national level policy could benefit from proposing and recommending the use of research methodologies that explore patients' choice, with a focus on prospective studies rather than after those conducted after reconfiguration has been implemented.

5.5 Limitations and Challenges

Having discussed how the findings compare to existing research and implications of such findings, it is important to acknowledge the limitations of the study. The following section will outline such shortcomings and acknowledge the need for future amendments.

5.5.1 Survey Tool

The concluding question of the questionnaire surveyed opinion regarding the respondent's views on the quality of the survey tool. It was reassuring that a large number of participants found the questionnaire interesting and informative, however it is noteworthy that a number of participants viewed aspects of the questionnaire in a negative manner. The most common negative response was that the participants found some of the questions difficult to understand. This was followed by participants finding the questionnaire too long.

Such results are noteworthy for future implementation of the questionnaire and amendments should reflect the participant feedback. When reflecting upon the literature regarding questionnaire structure, it is evident recommendations are equivocal regarding duration of the questionnaire. However, some authors highlight the potential for response bias if participants become disengaged when the questionnaire is too long (McColl et al 2001). When ruminating about amendments required to reduce the length of the

questionnaire it was evident that one of the items (Question five, see Appendix 2) necessitated consideration of a 25-item Likert scale question, which significantly contributed to the length of the questionnaire. Notably it was decided the data collated by Question five would not be used in the final analysis due to its length; consequently the question can be considered redundant and removed in future questionnaire versions. Such an amendment responds to the participant feedback regarding the questionnaire being too lengthy.

It is also interesting to note that a number of participants omitted to answer the question relating to salary. Numerous completed questionnaires contained handwritten comments suggesting the question was intrusive and perceived not to be relevant. Removing the item from the questionnaire would equate to valuable data being disregarded therefore it is worth considering amending the explanation and instruction regarding the value of collecting salary details. Having identified that more narrative was required explaining the value of such data and acknowledging the sensitive nature of the question, there was a need to ascertain what this would look like within the questionnaire. McColl et al (2001) suggest that some participants may ignore or overlook information if it only appears in the cover letter and warn against the temptation to include such narrative in the cover letter. They suggest that instructions and information specific to individual questions may have more impact if built into the questionnaire items. Considering such observations, the survey tool would benefit from such rationalisation being articulated in the question about salary rather than the cover letter.

When exploring the findings and the questionnaire responses, it was noteworthy that the question exploring health status was poorly framed. The question aimed to collate data regarding the participants' generic health status (prior to the ED admission); however, the lack of instruction regarding the context of the question led to ambiguity in response with some participants relating the question to the context of their recent minor injury/condition. Such observations suggest that the questionnaire requires more explanation and instruction regarding the purpose and context of Question 18 (see Appendix 2).

Finally, the questionnaire collated data which not used in the final analysis:

- Previous visits to ED and MIUs (Question 3 and 4)

- Treating clinician on previous visits e.g. doctor or ENP (Question 5)
- Views about the ED service and environment (Question 6)

Such redundant information may represent a source of data that may add more depth and breadth of understanding of patient's choice regarding minor injury services. The Likert question regarding patients' views of the ED service and environment (Question 6) provides a significant amount of data. It was decided that analysis of such data would not address the research question and aims of the study; however, this does not equate to the question generating redundant data. There is scope for such information to be analysed to explore the relationships between views of current ED services and choice of minor injury service. As previously highlighted Coster et al (2017) suggests patient satisfaction with care can predict future choice and preference; consequently analysis of the data produced by Question 6 would be suited to exploring such a postulation.

When discussing the limitations and challenges of the survey tool design, it is perhaps useful to also reflect upon the utilisation of a hypothetical scenario to extract data regarding preference behaviour. Some authors have warned about the pitfalls of including hypothetical questions within surveys (Bernard et al 2005). Based on a review of the literature Bernard et al (2005) categorises the common types of biases in questionnaires, which includes hypothetical questioning. The paper suggests that asking a participant about a belief (hypothetical) frequently yields different answers from asking questions about actual behaviour (personalised). Bernard et al (2005 p.3) uses the following example to illustrate such an argument :

- Do you think it is a good idea to have everyone's chest regularly checked by an x ray ? (belief question)
- Have you ever had yours checked ? (behaviour question)

Such an example illustrates the need to acknowledge that Question 7 (see below) may have the potential to capture patients beliefs rather than their preference behaviour:

*You attend the A&E department with a minor injury, the triage nurse informs you that you have the **option** to attend your local Emergency Nurse Practitioner (ENP) led Minor Injury Unit (MIU) where your injury will be assessed and treated by a fully trained ENP. The waiting time is **3 hours less** in the ENP led MIU compared with the A&E Department. Given this choice which option would you choose?*

That is, they may choose to attend an ENP led MIU given the hypothetical scenario of shorter waiting times, however this belief may not translate into the actual behaviour.

When considering other the limitations of the survey tool, it is also important to acknowledge that that the questionnaire did not include items that may have gathered data about 'local custom and practice'. That is, utilisation of other hospitals or services within the local area for emergency or urgent care. Any future versions of the survey tool would benefit from asking questions about if and how the participants have utilised other EDs, MIUs or primary care in other geographical locations, for emergency care. Such data would enable exploration of the correlation and predictive capability of 'local custom and practice' and the preference of an ENP led MIU versus a traditional ED. Once again such information would help identify any specific community groups that may require more targeted awareness and communication.

Finally, it is useful to acknowledge that the research (and methodology) could also be used to explore the preferences of patients within the context of the 'longer patient pathway'. That is, using the questionnaire to survey patients before they have made the decision to attend a hospital site for the management of their minor injury (ED or MIU). This could involve surveying patients when they contact self-help telephone advice line such as 111/NHS Direct, access online resources such as the 111 symptom checker or seek assistance from other primary care health professionals such as General Practitioner, practice nurse, pharmacist or optician. This would enable a greater understanding of preference regarding minor injury services when the patient initiates help-seeking behaviour, rather than when they have made a decision to attend a hospital service.

5.5.2 Study Sample

Although the sample was considered reasonably representative of the population attending the ED, the chief limitation of this study is the generalisability to other geographical locations within Wales and whether the findings can be regarded as representative of all local contexts. Subsequently, the proposal for a reliable predictor model regarding socio-economic and demographic factors and minor injury service choice may be questionable when applied to alternative populations. An example of such generalisability difficulties was illustrated with the factor of ethnicity. The study demonstrated a significant degree of ethnic homogeneity, with the sample being made up

of predominately white British. This sample bias may result in the findings not being representative of other populations with more ethnic diversity.

It is notable that this study does not explore the choice and preference of parents who seek minor injury emergency care for their children; this results from the study never setting out to investigate such a demographic. However, considering that children account for 25% of total ED attendances (Baker 2017) this can be judged as a sizeable proportion of the patient population requiring further research.

A further limitation of the study rests with the exclusion of patients with literacy problems and whose first language was not English or Welsh. Such an exclusion criterion was implemented to ensure that the burden of work for the triage nurse was kept to a minimum. As the study was unfunded, there was no resources available to utilise a separate data collection team to assist participants with literacy and language problems to complete the questionnaire. It can be contended that such an embargo may have influenced the lack of ethnic diversity in the study sample, which may have made for an inaccurate exploration of the influence of ethnicity on choice and preference of minor injury service.

On reflection, the sampling strategy only considered the choice and preferences of a patient population that had already accessed an ED, thus questioning the generalisability of the study. This has the potential to neglect the preferences and choices of the wider population who have not previously consulted or engaged with ED services. Such an issue is illustrated by Ryan et al (2001) in a systematic review of techniques for eliciting public preferences. The authors advocate that when exploring patient preference, it is important to question whose choice and preference is being measured and whether the sample is appropriate to address the research question. Ryan et al (2001) query whether we should obtain values from actual service users (as is the case in this study) or deduce the preferences of the general population or community. Gafni (1991) contends that when considering a publicly funded healthcare system, it is the views, choices and preferences of the general community that are most significant. The sampling strategy of this study failed to acknowledge the views of the wider population and as a consequence can be considered a weakness of the study. However, due to the study being an unfunded doctoral study, it was not feasible to consider amassing and analysing data on a larger scale.

5.5.3 Data Collection/Recruitment

The final key learning point is in relation to conducting research in a busy ED. Such research is a challenging undertaking. It was assumed that distributing questionnaires to ED patients at the point of triage would be a trouble-free endeavour and would be achievable within six months; this was not the case. It was soon evident that the triage nurses acting as recruiters and data collectors found the process difficult and reported that they felt uneasy about distributing the questionnaires, due to the fear of increasing the patient burden. This observation is echoed by Murphy and Nightingale (2002) who highlight when ED nurses are involved in collecting data, such as in the distribution of questionnaires they can often feel pressurised to oblige. A data collection activity can add to the pressures and demands of the workload. Murphey and Nightingale (2002) propose that it is paramount that staff involved in the research process are well prepared and supported throughout the process.

Regarding data collection, the biggest challenge was amassing enough completed questionnaires within the time constraints allocated for data collection. It was anticipated that collating 500 questionnaires would be easily achievable; however, this assumption was not without its challenges. The triage nurses who were predominately responsible for recruiting the participants and dispersal of the questionnaires reported several concerns. Firstly, the triage nurse testified that the process of respondent selection and then the time spent explaining the purpose of the research impacted upon their workload, especially in times of greater demand. This was a concern, as it was not the intention of the research to impact negatively upon the wait for triage times or create additional workload that might detract from patient care. As a result, the researcher had to respond to such difficulties and spent more time than anticipated in the field assisting with data collection.

The triage nurses expressed they frequently felt uneasy asking patients to complete a questionnaire, especially when they had experienced significant waits to be triaged. Some triage nurses reported that when recruiting they believed that questionnaire completion would be considered a burden for patients and therefore, there was a sense of 'embarrassment' when enlisting participants. This was the first time the triage nurses had been asked to facilitate research in the department and therefore familiarity with collecting data from patients was very limited. Such unease by the triage nurse may have led to the potential for selection bias. There was a risk the triage nurses in their role as 'gate keepers' inadvertently approached patients who they had established a good rapport,

or who appeared to be more likely to consent to participation. In order to mitigate the risk of selection bias the author ensured face-face interaction with the triage nurse, this occurred at least weekly. Such interaction involved the author providing updates regarding the progression of the data collection and enabled the triage nurses to provide feedback regarding the challenges and successes of recruitment. These sessions also allowed the author to raise the issue and awareness of selection bias with the triage nurses.

The challenges evoked by the recruitment and data collection are reflected in a study by McRae et al (2018). The research used semi-structured interviews with 37 Canadian adult and paediatric emergency medicine researchers to elicit barriers and facilitators to clinical engagement in research activities. The study acknowledges that as a result of overcrowding and workload the ability and willingness of ED clinicians to get involved in recruitment and data collection activities can be challenging. They suggest a raft of recommendations that include establishing a strong, research-supportive culture, clear communication between the research team and ED clinical staff and engaging ED nurses and allied health staff. Such recommendations would have assisted the challenges experienced in the recruitment and data collection periods of this study.

As the purposive sampling was conducted in the workplace of the author, the concept of the 'insider researcher' requires consideration. Literature suggests a diversity of definitions regarding the term 'insider researcher'. However, the phrase generally relates to those who opt to study a population which they may belong to, or have a close connection with (Breen 2007). This is in contrast with the term 'outsider researcher', whereby the researcher does not have prior knowledge of the organisation or group under study and has not connections to the population under scrutiny (Fleming 2018). As a result of such a definition, it can be deemed the author was an 'insider researcher' due to the participants being purposively selected from the patient population attending their workplace.

Much has been written about the challenges and benefits of being an 'insider researcher' in qualitative research (Flemming 2018, Breen 2007, Mercer 2006). Nevertheless, it is important this lack of discourse does not signify a disregard of 'insider researcher' impact on this study, particularly in relation to purposive sampling.

Some argue that becoming an 'insider researcher' could result in bias or loss of objectivity (Hewitt-Taylor 2002, Pitman 2002, DeLyser 2001). However, due to the quantitative nature

of the research and the purposive sampling approach, it can be reasoned that the issues of bias and objectivity created by the presence of an 'insider researcher' was not as troubling as if it was a qualitative methodology. The author was very familiar with the ED population being studied, the patient flow through ED and the ED computer software being used to establish inclusion and exclusion criteria. Consequently, It can be argued that being an insider 'researcher' enabled the author to develop a more robust understanding about how the purposive sampling and the elements of the research protocol were functioning. If the author highlighted any issues (e.g. triage nurse reluctance to approach patients) then extra support was provided by the author who fully understood the challenges and pressures of being a triage nurse (Bonner and Tolhurst 2002). To mitigate any potential bias created by the author being an 'insider researcher' the study used the triage nurses as 'gate keepers', who collected the data on the authors behalf. The author also used critical and reflective discussions with supervisors to shine a light on any potential for unconscious bias.

5.6 Recommendations

The following section will conclude the study by offering a suite of recommendations aimed at practice, future research, and policy.

5.6.1 Recommendations for Practice

The first recommendation for practice involves dissemination of research findings to the wider team. The Health Foundation (2017b) suggests that it is important when sharing research findings to identify your audience. In the case of this study, the initial audience would be the service commissioners and the managers of patient engagement and communications teams. By doing so, this would aim to influence and inform any agendas or strategies aimed at public engagement and communication. By participating in such professional networking activity and influencing, it is anticipated that the study findings will have a meaningful impact upon the reconfiguration of minor injury services by for example, encouraging patient awareness and understanding of what an ENP led MIU can deliver, compared with a more traditional ED.

Such a recommendation is deemed paramount, as evidence suggests that commissioning managers of healthcare services rarely seek formal, research-based information from academic sources (e.g. academic journals) (National Institute for Health Research 2018, Wye et al 2015, Dopson et al 2013, Edwards et al 2013, Swan et al 2012). This is supported

by Dopson et al (2013) who used comparative case studies from six health settings to investigate the use of management and organisational evidence. Such work found that knowledge generated from primary research and published in journals was the lowest source of influence on their decision making. This was also supported by a study conducted by Swan et al (2012) which explored how commissioning managers, public health experts, finance managers and clinicians utilised information and knowledge. The research found that academic research was frequently overlooked by commissioning managers, in favour of local public health intelligence and examples of what had worked well in other healthcare locations. The findings of Wye et al (2015) also confirm such a phenomenon; in a comparative case study of four commissioning organisations Wye et al (2015) found that commissioning managers frequently referred to best practice sources, local expert views and examples from other locations, however, infrequently referred to academic research.

As Wye et al (2015) articulate, researchers have faith in the written word when sharing findings and ideas; however, commissioners rely upon dialogue and conversation. As Wye et al (2015) suggest, 'researchers like to write, but commissioners like to talk'. As a result of such observations this study recommends that personal contact with the researcher of this study and the service commissioners/managers is paramount. It is recommended that in order to align the differing paradigms of the researcher and commissioners, the research is shared via the means of oral presentations, emails, meetings, and conferences in order to articulate the information in a timely, relevant and contextually specific manner and to enable further discussion (Wye et al 2015).

Another audience with which to share the findings is the 'patient-facing' emergency care clinical team. By sharing the research findings with such a clinical audience individual clinicians may be encouraged to share information with patients about the value of using ENP led MIUs rather than EDs. The clinicians may do this via dialogue and conversation, sharing of written information or signposting to pertinent resources regarding the service reconfiguration (e.g. online information). The findings will enable clinicians to focus such messages at younger adult patients and those from more affluent areas. Such a recommendation will also enable clinical staff that participated in data collection to realise that their involvement has produced tangible results that can be shared with patients presenting to emergency care. This is supported by a document written by Health

Improvement Studies Institute (2019) which advocates the involvement of NHS staff in the research process in order to maximise the impact of the research findings upon practice.

The study has established that failing to understand the influences on patients' choices of minor injury service may jeopardise the effectiveness of any engagement and communication campaign. Incorrect assumptions about the choice and preference of the patients could undermine the success of any engagement and communication strategy and, as a result, create difficulties with patients' utilisations of new service models (Craker 2014). Thus, an awareness campaign which does not appreciate its target audience and deliver clear, focused messages may be doomed to failure. Reflecting on such conjectures and the findings of the study, it is recommended that any reconfiguration engagement and communication strategy aiming to change or influence patient's choice and preference should establish target groups and develop key messages pertinent to such groups. In the context of this study, the target audience would be younger patients and those patients from less deprived areas. The key message to the younger patients would be the chance of shorter waiting times in the ENP led MIU and how such units can deliver minor injury care equal to that delivered by a doctor.

This is reflected in a paper by Craker (2014), who uses focus groups and a discrete choice experiment to generate data used to inform a persuasive communication campaign intended to reduce non-urgent ED attendance. Craker (2014) suggests that when designing a communication programme, it is important to understand the factors that influence, motivate and discourage the public from adopting a new behaviour (such as using an ENP led MIU). The author advocates the importance of linking such motivations into messages appealing to the beliefs or values of the receiver. This is reiterated by Batalden et al (2016) in a discussion paper about coproduction of healthcare services; the paper advocates that educating the public may involve recalibrating patients' expectations to sustain new habits. In the context of this present study, this would involve recalibrating the preferences and choices of the younger age group and people from areas of lower levels of deprivation, to appreciate the value of attending an ENP led MIU rather than a traditional ED.

To achieve such a 'reboot' of minor injury service preference, the study recommends focusing any communication campaign and resources at locations frequented by younger patients (e.g. colleges/universities, workplaces, leisure facilities, entertainment locations). The same would apply to reaching out to areas of less deprivation which may include

targeting specific community facilities such as shops, GP surgeries, pharmacies, cafes/restaurants, and recreation sites. As well as targeting specific locations, the study also recommends that communication strategies would benefit from using trusted sources to advertise the service, such as other health professionals/agencies (e.g. GPs, physiotherapists), social media contacts, family and friends and relevant social media platforms. This is advocated by Craker (2014) who suggests that an engagement and communication campaign benefits from using support from peer groups and professionals that patients may look to for guidance and social proof that a service is fit for purpose. The study recommends such peer and professional support could be provided by means of sharing experiences via methods such as blogs, online question and answer sessions and other resources generated by others articulating positive experiences of using an ENP led MIU.

One of the key 'messages for the NHS' which stems from this research is the need for more meaningful communication with the local communities, in relation to reconfiguration of healthcare services. In order to achieve more profound messaging, the findings of this research suggest that the NHS needs to move away from marketing strategies that are designed by the commissioners and clinicians. Instead, the NHS could benefit from co-produced awareness and communication strategies with NHS service providers and patients, especially where more intensive targeting (in the case of this study the younger age group and those less deprived) is required. This would enable the 'target audience' to advise on the content of the of the communication and awareness resources (e.g. posters, flyers, social media posts) and also suggest appropriate advertising platforms, which are pertinent to their demographic or socio-economic group.

NHS England (2017) highlights that while the NHS is good at innovation and invention, it is poor at sharing knowledge and translating research into practice. This is an important consideration when considering dissemination of the key research findings and messages with NHS, particularly in relation to NHS decision makers. Approaches to disseminating the research findings with the NHS include:

- Linking with regional and national NHS research networks
- Presenting at NHS research conferences/events

- Getting involved with NHS blogs and podcasts (especially in relation to service reconfiguration and associated communication strategy)
- Scoping out intended reconfiguration (especially in relation to emergency care) activity and sharing research findings with decision makers and communication teams
- Sharing findings with NHS managers
- Sharing findings with communication teams

5.6.2 Recommendations for Future Research

This study has generated several prospective avenues for future inquiry and may provide a platform for future related research and investigation. The following section will suggest how such inquiry can be developed.

Although this study was conducted using a quantitative approach, future research would benefit from exploring the qualitative nature of choice and preference when selecting a minor injury service. A qualitative methodology would build upon the findings of the study and add an extra layer of insight and understanding to the factors that shape service choice behaviour. Future qualitative investigation could also be used to expand the evidence as to why the younger age group and patients who have lower levels of deprivation prefer to access ED for the treatment of a minor injury and not an ENP led MIU. Such qualitative data would provide a useful adjunct to the current study and endeavour to ask more meaningful questions. This additional information would provide greater depth and insight into the behaviour of younger patients and the more affluent population when choosing a minor injury service. Once again, such data would enable a more targeted patient engagement programme in relation to the redesign of emergency care services.

Discussion of the research limitations indicate that generalisability to other locations and contexts is a weakness of the study. That is, choices of a minor injury service and the influence of the socio-economic and demographic profiles of patients may vary from population to population. Reacting to such criticism, it would be useful to apply the same methodology to exploring patient choice and preference regarding minor injury services in other geographical contexts. Comparison with other EDs in the national context of Wales and indeed the rest of the UK should be considered in future research. This would enable a comparison of results to ascertain any variations. It would also be valuable to apply the

same methodological approach to exploring patient's choice and preference in similar emergency care reconfiguration, as and when this occurs. There is also an opportunity to inform larger scale studies to inform larger-scale change for reconfiguration of all healthcare services.

As the discussion chapter highlights, a lone ED was used to recruit study participants, therefore generalisability of the findings to the wider population is questionable. In response to such an observation it would be worth extending the survey to a wider non-ED population (general public). Naturally, this may involve amendments to the recruitment process, however, amending the sampling strategy would capture participants within the wider community, thus improving generalisability. Such a plan would also aim to increase the sample size, responding to the criticisms of the survey in terms of wider representation.

It is notable that the sample survey only considered the choice behaviour of adult patients and excluded children. Therefore, it would be useful to survey the parents of children attending ED. It would be beneficial to compare the findings of such research with this study, as the parents of children attending ED would fall within the parameters of the younger age group, a demographic identified as a predictor of minor injury choice. It would be worthwhile exploring whether parents would transfer their personal choices and preferences when choosing a service to access for the treatment of their child with a minor injury. Future research into the choices and preference of parents regarding the use of minor injury services would add a breadth and width to this study and aim to achieve a holistic picture of choice behaviour.

A variable intrinsically linked with previous experience of a service and not addressed in this study is the impact of patient satisfaction with past use of emergency care services. Coster et al (2017) reports that there is a correlation between patient satisfaction with alternative services for the treatment of non-urgent conditions, such as primary care services, and the use of ED for minor ailments. That is, patients who express dissatisfaction with primary care are more likely to attend ED for minor presentations. There is a need to extend this investigation into whether previous use of MIUs and the level of service satisfaction correlates with future use of EDs for the treatment of a minor injury. Coster et al (2017) suggest that patient satisfaction with care can predict future choice and preference of service. A report that resonates with such findings can be found in the

Citizens Advice report 'Evolving expectations of GP services'. The report found that younger adults who have a less positive experience of GP services were more likely to use ED for primary care conditions. The report states that in 2013, out of the 4,500 people who sought Citizens Advice assistance regarding GP services, 21% were younger adults (14-34). The report continues to claim that 30% of younger adults rate GP services as very good, whilst people aged over 75 are twice as likely to rate their GP services as very good (64%). Finally, replication of the research will enable more reliability and validity testing of the data collection tool. This is significant, as the questionnaire utilised in this research is novel and not employed in any past study. Although constructed from several validated survey tools, the data collection tool would benefit from future implementation to establish more robust validity and reliability testing.

5.6.3 Recommendations for Policy

A significant proportion of government policy and communications regarding reconfiguration attempts to focus on influencing the population as a whole. Such policy fails to recognise that bringing about change in a community needs to appreciate the multiple factors and patients' characteristics that may influence choice (NHS 2015,2014,2013a, 2013b). The findings of this current study recommend that reconfiguration policy would benefit from using or encouraging research implementing methodologies able to explore the concept of choice and preference.

The focus of current health policy is to create specialist centres such a critical care centres and devolve some services, such as minor injury care. Such an approach endeavours to provide NHS emergency care services that are effective and efficient and react to the unsustainable demands upon the current emergency care system (Health Foundation 2017, NHS 2013b). However, the findings of this study indicate that policy needs to be explicit in how public expectations are managed and ensure that patient choice is considered. This is reflected by Sturgeon (2014) in an article discussing the difficulties of persuading service users that service reconfiguration will be of benefit. The discussion paper states policy frequently 'over promises' to the public and patients regarding greater choice of care options, with such choice frequently failing to emerge. This can be related to the reconfiguration of emergency care services which frequently advertises the clinical gain from centralisation of services (Health Foundation 2017) yet fails to create community

awareness of how this may involve a reduction in choice (e.g. the diversification of minor injury care). Policy needs to recognise the importance of providing a focused narrative with the local population and offer robust and accurate evidence to encourage patients to understand and use new emergency care models.

Essentially, the study recommends reaching policy makers by ‘Knowledge mobilisation’, that is encouraging a connectivity between the researcher and policy makers (National Institute for Health Research 2019). It is recommended that ‘knowledge mobilisation’ will be achieved by using the following:

- Engagement & networking with policy makers (collaborations and personal relationships)
- Conference/educational events
- Social media
- Targeted dissemination

(National Institute for Health Research 2019)

5.7 The Legacy of COVID-19

The COVID-19 pandemic has resulted in considerable disruption to models and systems of care delivery across the full range of clinical practice, including emergency care. The prolific and sudden world-wide spread of COVID-19 resulted in the rapid reconfiguration of EDs, across the globe. This rapid re-design of the ED infrastructure and system aimed to provide a safe working environment for both patients and staff and manage the demands created by the surge of patients with COVID-19 (Boyle and Henderson 2020). Fundamentally, the ‘re-setting’ of EDs in response to the COVID-19 surge involved reducing the overcrowding that has historically plagued EDs (RCEM 2020). An instant solution to ED overcrowding was the relocation of minor injury services to alternative hospital or geographical sites, away from the ED. In addition, such reconfiguration frequently involved the minor injury services being delivered by the ENP workforce, enabling Doctors to be redeployed to manage the surge in critically unwell COVID-19 patients (RCEM 2020).

As well as the implementing rapid reconfiguration of the ED environment and system, the initiation of the initial national lockdown also assisted with the ED overcrowding concerns.

ED attendances fell by 29% in March 2020 and 57% in April 2020 (compared with the same months in 2019) (Kelly and Firth 2020). The greatest reduction in ED attendance was seen in the lower acuity presentations (Vaughan 2020, RCEM 2020). Such a group encompassed patients presenting with minor injuries, which has relevance to this study. Although the reasons for a reduction in the minor injury attendances is yet to be explored, several explanations have been proposed. Such suggestions focus upon a 'behaviour change' shaped by the national lockdown. This includes reduction in road traffic and consequently traffic accidents (Carrington 2020), a reduction in work related injury (due to temporary closure of some work places/sites), reduction in organised sport and a reduction in physical assaults (Hymas 2020). RCEM (2020) also suggests that patients may avoid attending ED due to anxieties associated with the risk of COVID-19 exposure.

RCEM (2020) suggest the reduction in lower acuity ED attendances, may be as a result of such patients being treated by alternative services. This suggestion can be supported by an observed surge in the use of NHS 111 and other health advice phone lines (RCEM 2020). This amplified use of the 111 advice line denoted a change in the way patients accessed urgent care. Such a shift in patient behaviour when accessing urgent care services prompted UK Emergency care to consider the implementation of an 'ED/MIU appointment' (Mitchell 2020, Cardiff and Vale University Health Board 2020) which can direct patients to discrete minor injury service.

It can be argued the compulsory redirection of patients to discrete ENP led MIUs and the implementation of 'phone first' models will encourage the utilisation of ENP led MIUs instead of traditional EDs. The COVID-19 reconfiguration of EDs and emergency care systems has enhanced the utilisation of such services and potentially raised awareness of the benefits of attending an ENP led MIU (e.g. less waiting times, less overcrowding, ability to maintain social distance). The COVID pandemic may have inadvertently enhanced public awareness of ENP led MIUs and led to a greater familiarity of their benefits compared to a traditional ED. Subsequently, this increased familiarity with ENP led MIUs may encourage utilisation by groups less likely to choose such a service (in the case of this study the younger patients and those from less deprived areas). In the long term, this may result in patients directing themselves to alternative minor injury services and away from ED, thus reducing ED overcrowding and improving efficacy of the emergency care service.

5.8 Chapter Summary

In summary, the discussion chapter has enabled a greater appreciation of the findings, and how they have contributed to an improved understanding about how patients may choose an ED or ENP led MIU to access a minor injury service. This understanding includes appreciating what demographic and socio-economic factors may predict such choice and influence the reasons for such a choice.

The chapter has highlighted how the study sample appeared to be representative of the local population, which as a result established favourable generalisability.

The discussion compared the findings against those previously published. Such discussion concluded the findings of this study have addressed a gap in the existing evidence and generated novel knowledge regarding how patient demographic and socio-economic characteristics may influence choice of minor injury service (ED versus ENP led MIU).

The implication of the findings for reconfiguration of emergency care services were then reviewed. This highlighted the need to acknowledge the importance of using local knowledge, context, and patient characteristics to inform focused engagement and communication strategies regarding reconfiguration of local emergency care services. The discussion also highlighted the importance of identifying specific messages utilised in such strategies.

The chapter progressed to discuss the limitations and challenges of the study. Such discussion established that the survey tool (questionnaire) required future amendments, particularly regarding the exclusion of questions/items. The discussion also highlighted that the study sample although considered representative of the local population, could have benefited for being selected from a non-patient population to enhance the generalisability of the findings to the wider population. The discussion of limitations and challenges of the study identified the difficulties of conducting research in the context of an emergency care setting. The discussion highlighted how the high clinical workload reduces the willingness of ED clinicians to engage with data collection, thus making the research process challenging.

Finally, after discussing the study finding, the chapter presented a collection of recommendations, that if implemented could result in tangible and meaningful outcomes

for emergency care reconfiguration and patients. This involved describing recommendations for practice, future research, and policy.

Chapter 6 Conclusion

6.1 Introduction

This concluding chapter will begin by reviewing the research aims and overarching research question. Such an appraisal will establish whether the study has achieved the research aims and provided the data and results able to effectively answer the research question. The chapter will continue by discussing how the study has provided an original contribution to knowledge and how the findings have enabled strategies to facilitate impact

6.2 Review of Research Question and Aims

The primary aim of this study was to explore the choice of minor injury service among individuals attending an ED with a minor injury. The secondary aim was to identify demographic and socio-economic factors that predict such choice. It can be ascertained that cross-sectional study, using a combination of correlation and logistic regression analysis has generated data able to achieve the research aim.

The study endeavoured to answer the research question, 'What is the patient choice for delivery of minor injury care delivered via a traditional ED or ENP led MIU and are there any factors that predict this preference?'. The study was subsequently able to create a model containing the predictor variables of age and level of deprivation, which indicated it was possible to predict choice of minor injury service. The findings also suggested age correlated with reasons for such choice, which adds credence to the research question being satisfied.

6.3 Original Contribution to Knowledge

By using a cross-sectional design, the study investigated a raft of demographic and socio-economic variables and their ability to predict choice of minor injury service (ED or ENP led MIU). The study also explored how the same variables related to the reasons behind such choice behaviour.

Prior to this study, very little was known about the demographic and socio-economic factors that may predict patient choice of minor injury service between an ED and ENP led MIU, and the underlying motivation behind such choice behaviour. The related literature also demonstrates little appreciation of exploring patient choice behaviour before

reconfiguration of and change in emergency care services, including the redesign of minor injury services. Consequently, the study makes an original contribution in several areas.

The findings of this study amount to an original contribution by enabling an understanding of the demographic and socio-economic factors that shape choice behaviour when engaging with minor injury services. This area of study has been given cursory attention in existing, related literature. It can be argued that the findings of this study provide novel knowledge regarding choice behaviour prior to a reconfiguration of a healthcare service and not when new models of care have been implemented.

It can also be claimed that the findings of the study have produced original knowledge that can be used to inform public engagement and communication strategies in relation to the implementation of emergency care reconfiguration, particularly in terms of the roll out of ENP led MIUs in lieu of ED minor injury care.

Finally, facets of the methodology have also contributed to the originality of the study, the first being that of the survey tool. As discussed in Chapter Six, the questionnaire is unvalidated and would require further validity testing, however, the questionnaire has potential application in other healthcare settings, particularly those undergoing reconfiguration or redesign. By providing a combination of questions investigating hypothetical choices and views about the current service, the survey tool enables exploration of choice behaviour before the 'event' enabling a more comprehensive understanding and ability to forecast how the population may react to the reconfiguration of services.

6.4 Impact

The recommendations for practice outlined in Section 5.6.1 suggest that the findings of this study have potential to inform a focused patient/public engagement and communication campaign. The recommendations suggest that such campaigns should consider the use of social media platforms to reach younger adults and patients from areas of less deprivation. The author of the study has endeavoured to act upon such recommendations by producing a short awareness video regarding how and when to utilise an ENP led MIU (<https://youtu.be/LbxicPCOquM>). This resource has been shared widely on Health Board internet and social media platforms and has received positive feedback from patients regarding its content and purpose.

The author has also been involved in delivering a live question and answer session via the Facebook platform(<https://www.facebook.com/AneurinBevanHealthBoard/videos/353762319193869/>) During this session, the reconfiguration of local healthcare services was discussed, including the diversification of minor injury services way from the main ED. At the time of submission of this thesis, the question and answer event had been viewed by a significant audience of 29500 people.

Actualising impact will be an ongoing process and involve a 'bricolage' of approaches. Such approaches will include presentations and reports to key stakeholder groups, such as the health boards communication and patient engagement teams. Impact will also be achieved by publishing the findings in key academic journals and presenting them at conferences and educational events.

6.5 Key Points

This study has generated data that provide an insight into the choice behaviour of patients deciding between a traditional ED versus an ENP led MIU. The study achieved this by exploring which demographic and socio-economic characteristics influence such choice. In addition, the study has also produced an extra layer of understanding by exploring the reasons behind choices and how the same set of demographic and socio-economic characteristics impact upon the motivation behind the choice behaviour.

A key finding of the study indicated that it was possible to construct a model of demographic and socio-economic variables able to predict choice of minor injury service (ED versus ENP led MIU). Fundamentally, the model suggested the younger and the least deprived patients were more likely to choose an ED for a minor injury service. The findings also conclude that younger patients were more likely to utilise an ENP led MIU due to the shorter waiting times, yet also required reassurance that an ENP can deliver care equal to that of a doctor. Such key findings suggest caution in assuming all patients understand emergency care service reconfiguration and redesign. The study suggests that it may be unwise to assume an 'orderly paradigm' where patients choose the most appropriate option for their healthcare needs (Chapman 2004). A key learning point generated by the study is that healthcare reconfiguration necessitates acknowledgment of local context and how patients' characteristics may influence choice and preference of service. The findings

suggest that any public engagement and communication strategy regarding a change of healthcare service needs to be cautious of the 'one size fits all' approach.

The study identified how any public engagement and communication strategy encouraging the public to use an ENP led MIUs would need to target younger adults and people from areas of least deprivation. The findings also suggest that using a 'hook' message of shorter waiting times may encourage younger patients to attend ENP led MIUs. The findings also suggest that any messages or information aimed at the younger adult patient would also need to ensure clarification of the role and quality of care delivered by an ENP.

Although the study has generated novel findings, the study has also highlighted numerous ways to broaden our understanding of how people choose minor injury services. As discussed in the previous chapter, the key recommendations for future research involve investigating other variables such as 'previous experience of emergency care services' and 'previous visits to emergency care services'. An additional key recommendation, regarding future study, was to explore how the same set of demographic and socio-economic characteristics can predict parental choice of minor injury service.

Reflecting upon the methodological approach of the study, a key point for future research is the need for additional reliability and validity testing of the unvalidated questionnaire used to conduct this research. The study has also highlighted that the generalisability of findings may be improved if future study sampled from a population which was not made up of current users of an emergency care service.

Finally, the study has articulated how the findings have shaped two other key recommendations. The first being recommendations for practice which involved advocating how the findings of the study have informed any local engagement and communication strategy regarding the reconfiguration of emergency care services. That is that any strategy needs to focus communication at younger adults and those from areas of lower deprivation. The recommendation for practice also pronounced the need to share the findings with health service commissioners and managers, to promote networking activity and the sharing of academic research.

The final recommendation expressed the need for the findings of the study to be shared with policy makers. This involved establishing a method of 'knowledge mobilisation' to

those who are able to influence and lobby policy in regard to healthcare reconfiguration and emergency care.

6.6 Chapter Summary

This chapter has established how the study has addressed the research aims and subsequently answered the research question. The original contribution to knowledge was acknowledged, namely how the study compares with what is already known and how it promotes an enhanced understanding of patient choice in relation to minor injury services. The chapter progressed to articulate how the study has used the findings to produce a tangible action and impact. Finally, the chapter concluded with identifying the key points generated from the study data.

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Participant Information Sheet

Valuing the preferences of patients accessing unscheduled care services

You are being invited to take part in a research study because you have chosen to attend an Emergency Department with an injury or illness. The study aims to collect questionnaires from 1000 people accessing the services of a large Emergency Department. Before you decide to participate, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully. The triage nurse will go through the information sheet with you. Please ask the triage nurse if there is anything that you don't understand, or if you would like more information.

What is the purpose of the study?

The delivery of emergency care (unscheduled care) is changing. Emergency Departments across Wales are seeing a constant year on year increase in patient attendances. Due to such challenges the ability of Emergency Departments to meet waiting time targets and provide quality care can be compromised. As a result there is a need to develop and explore alternative services and facilities to the traditional Emergency Department, thus reducing the pressure on busy and congested Departments, improving waiting times and enhancing the quality of care.

The study would like to listen to the preferences of patients accessing emergency care and how these values influence choice of service or facility.

Why have I been approached?

We are looking for people over 18 who have accessed the services of an Emergency Department. We are looking to collect questionnaires from 1000 patients in total.

Do I have to take part?

The decision to take part in the study is entirely yours. If you decide not to participate then this will not influence the waiting time or quality of care you receive whilst in the Emergency Department. If you do consent to participate you are still free to withdraw from the study at any time.

What would taking part involve?

- After your initial assessment by the triage nurse you will be given the participant information sheet, consent form and questionnaire.
- You will be given time to think if you want to participate
- Whilst you are waiting to be assessed by an Emergency Department Doctor or Emergency Nurse Practitioner (ENP) you will be given the opportunity to complete the questionnaire. Completing the questionnaire will not increase your waiting time to be seen by a Doctor or Emergency Nurse Practitioner.
- It is anticipated that completion of the questionnaire will take approximately 10 mins.

- Once completed, the questionnaire can be deposited in a locked box in the minor injury waiting room. The questionnaires will be retrieved from the locked box by the researcher and stored in a locked filing cabinet in the Emergency Department.
- If you have any questions or queries regarding completion of the questionnaire then the triage nurse will be able to assist.
- If you require the questionnaire in Welsh, please ask the triage nurse
- If English or Welsh is not your first language, then please ask the triage nurse for assistance.
- If you are unable to understand or read the questionnaire please ask the triage nurse for assistance.

What are the possible benefits of taking part?

Although we are unable to provide any benefits during your current Emergency Department visit we hope that your opinions will enable a better understanding to how patients feel and behave when accessing emergency care (unscheduled care). This information will help us to improve the way in which future emergency care services are planned and introduced.

What are the possible disadvantages of taking part?

The only disadvantage to taking part in this study is the time it may take to complete the questionnaire. Also, it is possible that some of the questions may be sensitive to some however there will always a triage nurse available to address any of your concerns.

What will happen if I don't want to carry on with the study?

You are able to withdraw from the study at any time, without giving a reason. If you decide to withdraw then this will not have a negative effect on your care. Any completed/incomplete questionnaires or consent forms will be destroyed.

Who is organising and funding the research?

The research is being conducted as part of a Professional Doctorate in Advanced Healthcare via Cardiff University, School of Healthcare studies. The researcher is conducting the study with the assistance of senior academic staff from Cardiff University.

Who has reviewed this study?

This study has been reviewed by the Research Ethics Committee (REC) for Wales and the Research Review & Ethics Screening Committee (RRESC) in Cardiff University (School of Healthcare studies)

How will my information be kept confidential?

All information collected throughout this study will be kept strictly confidential. Your personal details such as name, address etc. will not be required, ensuring that all information gathered is anonymous. The completed questionnaires will be deposited in a locked box and then stored in a locked filing cabinet within the Emergency Department.

Data will be kept securely for a minimum of 15 years in accordance with good research practice and the Data Protection Act (1988). Access to the data will only be available to the researchers attached to the study from Aneurin Bevan University Health Board and Cardiff University.

What will happen to the results of the research study?

It is the intention to share the findings via written reports to the clinical directors and corporate executive team of Aneurin Bevan Healthboard. The findings will be published in academic journals and via conference presentations and posters. It is also the intention to share the findings with patient and community groups. If you would like a summary of the

findings once the research is complete please contact Claire McCarthy email:

Claire.mccarthy@wales.nhs.uk

What if there is a problem?

If you have any problems or concerns about the study, you can speak to the researcher directly (contact details below)

Claire McCarthy (Lead Emergency Nurse Practitioner Royal Gwent Emergency Department and Ysybty Ystard Fawr Minor Injury Unit)

Royal Gwent Emergency Department

Royal Gwent Hospital

Cardiff Rd

Newport

NP20 2UB

Email: Claire.mccarthy@wales.nhs.uk

Telephone: 01633 234056

or if you wish to complain formally, you can contact:

ABB.R&D@wales.nhs.uk

Appendix 2 Cover Letter and Questionnaire



Thank you for taking time to consider taking part in this research study

You are being invited to take part in a research study being carried out as part of my Professional Doctorate in Advanced Healthcare Practice. Before you decide to take part in the study it is important that you understand how the research will be done and what the findings will be used for. Please read the attached Information leaflet carefully before making a decision to take part in the study. Once you have made a decision to take part in please ensure the consent form is completed.

Emergency Departments (EDs) in the UK are seeing a year on year increase in patients using their services. This increased demand means providing timely and quality emergency care is a major challenge. As a result of the increasing pressures on ED services it has become necessary to encourage patients to consider alternative sites that provide services that are the same as a traditional ED. If you are suffering from a minor injury one such alternative is to use the services of an Emergency Nurse Practitioner (ENP) led Minor Injury Unit (MIU). An Emergency Nurse Practitioner (ENP) is a nurse who has experience working in ED or minor injury units (MIU) and has chosen to expand their knowledge and skills in minor injury care. This specialist training involves University education as well as training on the job by senior ENPs and senior ED Doctors. The ENPs build up a clinical portfolio and sit exams to demonstrate that they are competent to see patients with minor injuries without reference to a Doctor. ENPs can request investigations such as x-rays and blood tests and interpret the findings to provide an accurate diagnosis and treatment of minor injuries. ENPs can see the following injuries:

- Sprains and strains
- Broken bones
- Wounds and wound infections
- Minor burns and scalds
- Minor head injuries
- Insect and animal bites
- Minor eye injuries
- Minor injuries to the back, shoulder and chest

We are looking for volunteers to take part in this study and produce data that will help future ED and Minor injury services which respond to the needs of the patients using them. If you agree to take part you will be given a questionnaire to complete whilst you are in the ED Department, completion of this questionnaire will take approximately 15 minutes. The questionnaire will consist of some questions exploring your views and opinions about ED and the use of ENP led MIUs.

All the information collected in this questionnaire will be treated confidentially and your name and personal details will remain anonymous. The answers provided will not effect the quality of care you receive during your ED attendance.

Please be aware that you are able to refuse to take part in the study or withdraw from taking part at any time without providing any reason. This will not effect the quality or timeliness of the care you receive whilst in ED.

If you need to ask further questions please feel free to ask any of the triage nurses or contact Claire McCarthy on claire.mccarthy@wales.nhs.uk

Thankyou for your time and Help

Claire McCarthy

(Lead Emergency Nurse Practitioner, Royal Gwent A&E and Ysybty Ystrad Mynach Minor Injury Unit)

Date.....

Questionnaire

Thank you for agreeing to take part in this study. We are interested in what you think and there are no right or wrong answers. Please carefully read each question and we would appreciate if you could answer each question as honestly as possible. All information collected is extremely valuable and will be studied and analysed for the future provision of minor injury services.

Question 1
Please give your post code _____

Question 2	
Please tick the option which best describes your illness or injury that has caused you to attend A&E today	
Cut/wound/laceration	<input type="checkbox"/>
Burn/scald	<input type="checkbox"/>
Limb injury or pain	<input type="checkbox"/>
Head or face injury	<input type="checkbox"/>
Mental health problems	<input type="checkbox"/>
Ear, nose or throat problems or injury	<input type="checkbox"/>
Back/neck pain/injury	<input type="checkbox"/>
Skin problems	<input type="checkbox"/>
Eye problems or injury	<input type="checkbox"/>
Stomach problems	<input type="checkbox"/>
Chest pain/injury	<input type="checkbox"/>
Collapse/faint	<input type="checkbox"/>
Pregnancy problem	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>

Question 3
Have you used an Accident and Emergency (A&E) or Minor injury unit (MIU) in the last 12 months?
No <input type="checkbox"/> (go to question 6)
Yes <input type="checkbox"/> which service did you use? A&E <input type="checkbox"/> OR MIU <input type="checkbox"/>

Question 4
How many times in total have you visited A&E or MIU in the last 12 months?
A&E _____ MIU _____

Question 5
When you attended A&E/MIU who were you treated by?
<input type="checkbox"/> Doctor
<input type="checkbox"/> Emergency Nurse Practitioner (ENP)
<input type="checkbox"/> Unsure
Other (please state if known) _____

Please think for each of the following statements say how much you agree or disagree with each one by ticking the box that best suits your thoughts about Accident and Emergency Departments and the service which it delivers.

Question 6	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I believe that an A&E Department should be available within 5 miles of my home					
I believe that each main town/city should have an A&E Department					
The waiting times to be seen and in A&E are satisfactory					
Do you think that people with minor injuries/illness should wait longer to be seen compared with people who have more serious illness/injury?					
I have had a good experience of A&E in the past					
Parking availability is important when I attend A&E					
I believe that A&E provide good care for patients who have a minor injury					

I would prefer to attend A&E than go to my local GP					
I would prefer to attend A&E rather than contact or attend out of hours GP services					
I believe that A&E provides high quality care					
I believe that the A&E department provides adequate information about waiting times					
Having access to food and drink vending machines is important to me when I attend A&E					
Having access to café/canteen/coffee shop whilst in the A&E Department is important					
I believe that the A&E Department is clean					
I believe that the A&E environment provides comfortable seating					
I believe that the A&E department provides adequate toilet facilities					
I believe that the A&E Department provides adequate entertainment when waiting to be seen (e.g. TV, reading material)					
I believe that the A&E environment maintains my privacy and dignity throughout my visit					
I believe that all patients attending A&E should be seen no matter what illness/injury or problem they have					
I believe that A&E nursing staff and Doctors should be able to redirect you to appropriate health care services if your injury/illness is better managed					
The A&E nurses and Doctors provide accurate information about diagnosis and treatments					
I am always treated with dignity and respect whilst in the A&E Department					

Consider the following 'hypothetical' situation

You attend the A&E department with a minor injury, the triage nurse informs you that you have the **option** to attend your local Emergency Nurse Practitioner (ENP) led Minor Injury Unit (MIU) where your injury will be assessed and treated by a fully trained ENP. The waiting time is **3 hours less** in the ENP led MIU compared with the A&E Department. Given this choice which option would you choose?

Question 7

- I would choose to stay in the A&E Department (go to question 8)
- I would choose to attend the local Emergency Nurse Led MIU (go to question 9)

Question 8

Please read each of the following sentences and select the one that best explains your reason for staying in A&E

- I do not understand the role of an ENP led MIU and do not believe that an ENP has enough training/education/experience to treat my minor injury effectively and therefore would want to see an A&E Doctor
- I feel reassured by Doctors being on site
- The waiting times are shorter in A&E
- I haven't any transport to travel to another unit
- It would cost me more money to travel to the MIU
- The Car parking facilities are better in A&E
- The access to canteen/café/coffee shop is better in A&E

Question 9

Please read each of the following sentences and select the one that best explains your reason for choosing an Emergency Nurse Practitioner MIU

- I trust that an ENP is able to assess, diagnose and treat my minor injury effectively without reference to a Doctor
- The waiting times are shorter in the ENP led MIU compared with the A&E Department
- There are better facilities
- My minor injury would be seen as low priority in A&E

Question 10

How did you get to A&E today?

- Car Bus Train Ambulance
- Taxi Bicycle Motorcycle/scooter/moped
- Lift with family or friends On foot

Other (please state).....

Question 11

How long has it taken you to travel to A&E department today?

_____ Hours _____ minutes

Question 12

How many miles did you have to travel to the A&E department today?

_____ miles

Question 13

How much money did you spend getting to A&E and whilst in A&E? (food, drinks and transport costs)

- | | | | | |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <input type="checkbox"/> Nothing | <input type="checkbox"/> £0-£5 | <input type="checkbox"/> £6-£10 | <input type="checkbox"/> £11-£16 | <input type="checkbox"/> £17-£20 |
| <input type="checkbox"/> £21-£25 | <input type="checkbox"/> £26-£30 | <input type="checkbox"/> £31-£35 | <input type="checkbox"/> £36-£40 | <input type="checkbox"/> £41-£45 |
| <input type="checkbox"/> £46-£50 | <input type="checkbox"/> £51 + | | | |

Finally, we would like to ask you some questions about yourself. This will help us in understanding your choices and to make sure that our survey is representative for the study. Remember that all information you give will be kept confidential.

Question 14

Are you? Male Female

Question 15

Which year were you born?

Question 16

How many people are in your household?

1 2 3 4 5 6 7+

If more than 7 please specify _____

Question 17

Do you consider yourself?

- White British
- White
- Black/African/Caribbean/Black British
- Asian/Asian British
- Chinese
- Arab
- Hispanic/Latino
- Mixed/multiple ethnic groups

Question 18**Marital Status**

- Never married and never registered a same-sex civil partnership
- Married
- Same sex-civil partnership
- Widowed
- Separated, but still legally married/same sex-civil partnership
- Divorced
- A member of an unmarried couple
- Civil partnership
- Would rather not say

Question 19**What is your highest completed qualification?**

- 1 to 4 Olevels/CSEs/GCSEs (any grades)
- 5 or more Olevels (passes)/CSEs (grade 1)/GCSEs (grades A* - C)
- NVQ level 1
- NVQ level 2
- NVQ Level 3
- NVQ level 4-5 HNC, HND, BTEC Higher Level
- Degree (for example BA, BSc)
- Higher Degree (MA, PhD)
- Professional qualifications (for example teaching, nursing, accountancy)
- Other vocational/work related qualifications
- Foreign qualifications
- No qualifications

Question 20 Health Status**Mobility**

- I have no problems walking about
- I have slight problems walking about
- I have moderate problems walking about
- I have severe problems in walking about
- I am unable to walk about

Self-Care

- I have no problems washing or dressing myself
- I have slight problems washing or dressing myself
- I have moderate problems washing and dressing myself
- I have severe problems with washing and dressing myself
- I have severe problems washing or dressing myself
- I am unable to wash or dress myself

Usual Activities (e.g. work, study, housework, family or leisure activities)

- I have no problems doing usual activities
- I have slight problems doing usual activities
- I have moderate problems doing usual activities
- I have severe problems doing usual activities
- I am unable to do my usual activities

Pain/Discomfort

- I have no pain or discomfort
 I have slight pain or discomfort
 I have moderate pain or discomfort
 I have severe pain or discomfort
 I have extreme pain or discomfort

Anxiety/Depression

- I am not anxious or depressed
 I am slightly anxious or depressed
 I am moderately anxious or depressed
 I am severely anxious or depressed
 I am extremely anxious or depressed

Question 21**Are you currently in paid employment**

No (go to question 22)

Yes what is your Hourly rate of pay before tax? £ _____ or salary per year £ _____
 (go to question 23)

Question 22**Are you.....(Please tick one)?**

- | | |
|--|---|
| Not working (seeking work) <input type="checkbox"/> | Full time education <input type="checkbox"/> |
| Retired <input type="checkbox"/> | Long term sick or disabled <input type="checkbox"/> |
| Looking after home or family <input type="checkbox"/> | Self-employed or freelance <input type="checkbox"/> |
| On a government sponsored training scheme <input type="checkbox"/> | |

Question 23**Thinking about the cost of living as it affects you and your household, which of these best describes your situation best at present?**

- I find it a strain to get from week to week I have to be careful about money
 I am able to manage without much difficulty I am quite comfortably off

Question 24**Finally what is your opinion of this survey? (tick all that apply)**

- Interesting Unrealistic too long Informative Difficult to understand
- Other (please state) _____

Please place your questionnaire in the sealed box in the waiting room

THANK YOU

Appendix 3 STROBE – Critical Appraisal Tool

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation
Title and abstract	1	<u>(a) Indicate the study’s design with a commonly used term in the title or the abstract</u> (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Objectives	3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	4	Present key elements of study design early in the paper
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods confounding	12	(a) Describe all statistical methods, including those used to control for
		(b) Describe any methods used to examine subgroups and interactions
		(c) Explain how missing data were addressed
		(d) If applicable, describe analytical methods taking account of sampling strategy
		(e) Describe any sensitivity analyses

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest
<u>Outcome data</u>	<u>15*</u>	Report numbers of outcome events or summary measures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included

(b) Give reasons for non-participation at each stage

(c) Consider use of a flow diagram

(b) Report category boundaries when continuous variables were categorized

(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses
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1

Discussion

Key results	18	Summarise key results with reference to study objectives
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based
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*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

