Alcohol related presentations to the Emergency Department

A feasibility randomised controlled trial to investigate the impact of a brief intervention for adults to encourage changes in behavioural drinking beliefs and patterns
Abstract

Background: Problem drinking has long been recognised as having a negative impact on health, wellness, lifestyle, family and social commitments. The detriments associated with binge drinking are well documented through literature, and yet it is still a societal norm to drink to excess with no thought for the consequences both in the short or long term. Problem drinking places immense strain on an already faltering health system; and yet there remain few successful mechanisms to address this problem.

Objective: This study aims to explore whether screening and brief intervention encourages changes in behavioural drinking beliefs and patterns in young people attending the Waikato Hospital Emergency Department (ED) with an alcohol related injury.

Participants: Men (n = 23) and women (n = 11) over 18 years of age (mean age 24.4) attending the Waikato Hospital ED with an alcohol related injury or attendance.

Methods: Potential participants were identified by members of the clinical team, and when sober, were consented, and completed the Alcohol Consumption Tool (ACT), whilst in the ED. They were then randomised into control and intervention groups. The intervention group were sent a alcohol reduction literature pack within one week of their ED attendance, and were subsequently contacted via telephone, by an ED nurse in relation to the literature. Both groups were contacted by telephone at six weeks post ED attendance and underwent a repeat ACT assessment.

Results: Primary analysis with an independent samples t-test revealed no statistical differences between groups (p = 0.466), although a clear trend for reduction was demonstrated between mean number of drinks consumed both per week and per session, between time point one and time point two, in both the intervention and usual care groups. Age (p = 0.140), and gender (p = 0.857) showed no statistical significance to drinks consumed at either time point.

Conclusions: This study demonstrated that participants were likely to attempt to modify risky drinking behaviours post intervention, and that carrying out a brief intervention in the emergency department setting was feasible. Although due to the time requirements to contact study participants, a telephone based brief intervention may not be the most time effective means of implementing a screening and brief intervention policy. Further research may include exploring a more time effective means of delivering a screening and brief intervention programme on a national level.
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I would firstly like to thank my partner Emma Petersen. Emma your support throughout the duration of this programme has been unfaltering, your patience and belief in me are truly amazing and I cannot thank you enough for being there through the highs and lows of what has been a rollercoaster ride for the past eighteen months!

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Contribution

I, the researcher undertook all aspects of this study under the direct guidance of my supervisor. This entailed choosing the appropriate research design, the data collection and analysis, and the publishing of the findings in this dissertation.
Dedication

This dissertation is dedicated to my partner Emma. For the sacrifices you have made for me over the past 18 months, for always standing by my side, for your unconditional support and understanding, and for your editing skills, thank you.
# Table of contents

Chapter I: Introduction ........................................................................................................... 11

Chapter II: Literature review ............................................................................................... 15
  2.0 Introduction ....................................................................................................................... 15
  2.1 Literature search ................................................................................................................ 15
  2.2 The physiology of alcohol ............................................................................................... 16
  2.3 The culture of alcohol ....................................................................................................... 17
  2.4 Alcohol, a growing problem ........................................................................................... 19
  2.4.1 Demographics ................................................................................................................. 19
  2.4.2 Effects on mental health ............................................................................................... 20
  2.4.3 Effects on physical health ............................................................................................ 22
  2.5 Conclusion ....................................................................................................................... 26
  2.6 The New Zealand burden of problem drinking ............................................................... 26
  2.7 Health expenditure .......................................................................................................... 31
  2.8 Brief interventions in healthcare .................................................................................... 33
  2.9 Brief interventions in the ED targeting alcohol ............................................................... 35
  2.10 Summary ....................................................................................................................... 39

Chapter III: Methodology ..................................................................................................... 41
  3.0 Introduction ....................................................................................................................... 41
  3.1 Research paradigm ........................................................................................................... 41
  3.2 Quantitative research ........................................................................................................ 41
  3.3 Randomised controlled trial ............................................................................................ 42
  3.4 Researching an affronting topic ....................................................................................... 43
  3.5 The researcher ................................................................................................................. 44
  3.6 Summary ......................................................................................................................... 44

Chapter IV: Methods ............................................................................................................. 45
  4.0 Introduction ....................................................................................................................... 45
  4.1 Health services under investigation ............................................................................... 45
  4.1.1 The intervention group ............................................................................................... 45
  4.1.2 Usual care group .......................................................................................................... 46
  4.2 Research design .............................................................................................................. 46
  4.3 Population under investigation ..................................................................................... 48
  4.3.1 Inclusion criteria ......................................................................................................... 49
  4.3.2 Recruitment strategy .................................................................................................. 49
  4.3.3 Randomisation assignment ....................................................................................... 49
  4.4 Outcome measures ......................................................................................................... 49
  4.4.1 Primary endpoints ....................................................................................................... 50
  4.4.2 Secondary endpoints .................................................................................................. 50
  4.4.3 Power testing ............................................................................................................. 50
  4.5 Pilot study ....................................................................................................................... 50
  4.6 Statistical considerations ............................................................................................... 50
  4.6.1 Primary analysis ......................................................................................................... 51
  4.7 Ethical considerations .................................................................................................... 51
  4.8 Summary ......................................................................................................................... 51

Chapter V: Results .................................................................................................................. 52
  5.0 Introduction ....................................................................................................................... 52
  5.1 Sample characteristics .................................................................................................... 52
  5.1.1 Recruitment ................................................................................................................ 52
  5.1.2 Demographics ............................................................................................................. 54
Introduction

5.2 Primary endpoints ..............................................................55
5.3 Secondary endpoints ...........................................................58
5.4 Conclusion ...........................................................................71

Chapter VI: Discussion ..................................................................72
6.0 Introduction ...........................................................................72

Part I: The impact of offering a brief intervention: the study findings ...........73
6.1 Study findings .........................................................................73
6.1.1 What is the impact of a targeted literature pack? .......................74
6.1.2 Is a nurse-led intervention an appropriate and efficient use of resources? ....75

Part II: The feasibility of implementing a brief intervention in ED ...............78
6.2 A new way of thinking ............................................................78

Part III: Limitations, conclusions, practise and policy implications ..............80
6.3 Study limitations .....................................................................80
6.3.1 Bias ..................................................................................80
6.3.2 Concealment allocation .......................................................80
6.3.3 Baseline assessment ............................................................81
6.3.4 Blinding .............................................................................81
6.3.5 Intention to treat .................................................................81
6.3.6 Hawthorne effect ...............................................................82
6.3.7 Drop-out ............................................................................82
6.3.8 Study environment ..............................................................82
6.3.9 Participant characteristics ...................................................82
6.3.10 Sample size .......................................................................83
6.4 Implications of the binge drinking population ....................................83
6.5 Future research .......................................................................86
6.5.1 The relationship between a brief intervention and the health sector ..................86
6.4 Conclusions ...........................................................................87

Chapter VII: Appendices ................................................................89

References ..................................................................................111
List of figures and tables

Figure 4-1. Research design........................................................................................................49
Figure 5-1. Consort flow diagram............................................................................................54
Figure 5-2. Mean number of drinks consumed per week .........................................................58
Figure 5-3. Mean number of drinks consumed per session ......................................................59
Figure 5-4. Types of beverage consumed at time point one.......................................................60
Figure 5-5. Types of beverage consumed at time point two .....................................................61
Figure 5-6. How often do you have a drink containing alcohol ..............................................62
Figure 5-7. How any units do you have on atypical day when you are drinking ......................63
Figure 5-8. How often have you had six or more if female, and eight or more if male .......64
Figure 5-9. How often in the last year have you found that you were unable to stop ...........65
Figure 5-10. How often during the last year have you failed to do .....................................66
Figure 5-11. How often during the last year have you needed an alcoholic drink ...............67
Figure 5-12. How often during the last year have you had a feeling of guilt or remorse ....68
Figure 5-13. How often during the last year have you been unable to remember ............69
Figure 5-14. Have you or somebody else been injured as a result of your drinking ..........70
Figure 5-15. Has a relative, friend, doctor or other health worker been concerned ..........71
Figure 5-16. Total AUDIT score.............................................................................................72

Table 2-1. Percentage of population drinking to excess in a self-reported study ........21
Table 2-2. Percentage of binge drinking and it’s effects amongst New Zealand Māori ....29
Table 3-1. Classification of evidence .......................................................................................44
Table 5-1. Demographics of study participants by group .......................................................55
Table 5-2. Ethnicities of study participants by group ............................................................56
Table 5-3. Tests of between subject effects ............................................................................57
Chapter I: Introduction

That’s the problem with drinking, I thought, as I poured myself a drink. If something bad happens you drink in an attempt to forget; if something good happens you drink in order to celebrate; and if nothing happens you drink to make something happen.

Charles Bukowski, Women

“Alcohol is the fifth leading cause of global disease burden worldwide” (Chou et al., 2012, p. 407) and New Zealand is by no means immune to this problem. Exposure to this environment leads to compounding patterns of individual, family and social dysfunction and disruption (Afifi et al., 2008; Christoffersen & Soothill, 2003; Popova, Giesbrecht, Bekmuradov, & Patra, 2009; Rossow, 2000). The harmful impact of problem drinking contribute significantly to numerous social issues including financial stress, violence and aggression, injury to self / others, disease progression, social isolation, child abuse and neglect, attempted and completed suicide, drink driving and consequent injury and / or death (Rossow, 2000). Harmful drinking is one of the causal factors for an increasing number of Emergency Department (ED) attendances and hospital admissions annually (Charalambous, 2002; Lee & Forsythe, 2011). The New Zealand Alcohol Advisory Commission (ALAC) guidelines define harmful drinking as five or more units of alcohol for males, and four or more units of alcohol for females in a single drinking session (ALAC, 2013).

Problem drinking as defined by the ALAC has become a societal norm in the western world. The effects of which are felt in every facet of health, employment, family and personal functioning. This in turn places increased demand on emergency services, overcrowding of EDs, and increasing resource demand at departmental and hospital levels. Numerous reviews and studies reveal the vast effects of binge drinking on mental and physical health (Brust, 2005; Kuhn, Swartzwelder, & Wilson, 2008; Lohr, 2005; Schuckit, 2005; Vonghia, Leggio, Ferrulli, Bertini, Gasbarrini, Addolorato, 2008). Alcohol is distributed throughout the entire body via the bloodstream, thus no organ is spared its toxic effects. The greater the consumption, and the more regularly alcohol is consumed, the greater the incidence of injuries,
disease formation and progression. Such injuries and illnesses are resulting in greater than ever health expenditure. Just one example of the ever-increasing disease burden is the rise in ED attendances related to attempted suicides; young women between the ages of 14 and 20 who are clinically intoxicated are especially prominent (Rossow, 2000). Attempted or completed suicide may be grouped in the overarching umbrella of violence and aggression, which also statistically increase with problem drinking.

Reportedly, rates of domestic violence rose in accordance with both the length and severity of alcohol use; family violence was reported to be higher amongst lower socio-economic alcohol users (Rossow, 2000). The ED sees a growing number of assault related injuries, family violence and intoxicated, injured individuals being brought in by the police, particularly on weekends (Taylor et al., 2010). This places strain on a department already under pressure and puts the health and safety of other patients and staff at risk. At an individual level, children are particularly vulnerable to the effects of witnessing both binge drinking and the effects thereof, such as violence and aggression. Subsequent to alcohol exposure, children were also at higher risk of going on to develop their own alcohol dependence issues later in life. These issues have been linked to a number of coexisting alcohol related social harms.

Social issues of note included the rise in falls, homicide rates, motor vehicle accidents, and disease progression as the rate of harmful drinking increased. In 2011, driving under the influence of alcohol and / or drugs played a significant part in a number of road traffic accidents resulting in harm to not only the individuals who were intoxicated, but innocent members of society too (Ministry of Transport, 2012). Injury, falls and disease management are common causes of repeat attendance to the ED, a recurring trend with alcohol related illness and injury. ED is already overburdened with patients suffering the long-term effects of alcohol abuse and binge drinking, and is now seeing an ever – increasing number of younger attendees suffering the acute consequences of the binge drinking culture in the form of injuries (Forsythe & Lee, 2012).

New Zealand’s binge drinking culture revolves in the main around alcohol, idolising the effects of intoxication as a social norm (Balodis, Potenza, & Olmstead, 2009).
Young adults, over the age of 18 are particularly likely to be drinking excessive amounts of alcohol and binge drinking to the point of intoxication (Hingson, Heeren, Edwards, & Saitz, 2012; Imlach Gunasekara et al., 2011). Binge drinking is defined as consuming more than the recommended five units for males, and four units for females in a single drinking session (ALAC, 2013). The binge drinking culture of young adults places an exorbitant strain on the emergency services, as well as at departmental and hospital levels. Physical and mental illness and injury as a direct result of alcohol ingestion contribute to a growing number of ED presentations every year (Balodis et al., 2009). Increasingly longer wait times are experienced on the weekends due to alcohol related attendances; as well as the need for extra resource utilisation such as hospital security to maintain staff and patient safety. Despite the exorbitant strain alcohol related presentations place on an already under-resourced health system, no formal screening or brief intervention is being offered in the ED setting.

Correlations have been found between the introduction of a brief intervention tool and reductions in social harm behaviours such as smoking and excessive alcohol use (D’Onofrio et al., 2008). Brief intervention ranges from motivational interviewing to interactive sessions, aimed at raising awareness of a problem, offering targeted reduction advice and support, and an action plan to reduce the stated problem. Screening and brief interventions are an efficacious health promotion strategy that target practises to reduce injury and disease progression; by increasing public health awareness, and actively working to reduce harmful behaviours (D’Onofrio et al., 2008). The feasibility of delivering brief intervention services is now far surpassing the feasibility of delivering more intensive rehabilitation services due to the lack of human resources needed to maintain these programmes.

Albeit dated, an article by Bien, Miller, and Tonigan (1993) found that a brief intervention was up to 78 percent more successful in reducing problem drinking than referral to alcohol rehabilitation services. Young adults were more receptive to brief interventions than intensive rehabilitation programmes due to the minimal interruption to their personal and social lives. In the case of young adults, brief intervention is used as a prevention strategy against the development of chronic...
harmful drinking patterns. Heather (2012) argues that the public health benefits for using a brief intervention strategy are immense, in that the key is early intervention prior to the development of chronic harmful drinking patterns that become entrenched in the person’s social identity. This not only reduces the person’s risk of alcohol related disease progression and injury, but prevents the need for intensive addiction intervention in the future. It is also noted that even if the person chooses not to act on the information they have been given about a healthier lifestyle, it prompts deeper thought by the individual about their lifestyle and health (Heather, 2012). Hence, the person may not reduce their drinking immediately, but over time may re-evaluate their drinking patterns and initiate changes toward drinking at a safer level.

Quantitative trends illustrate that the ED environment presents a unique opportunity for administering a brief intervention for harmful drinking. EDs worldwide form the main access point for all illness and injury needing secondary care; consequently ED acts as the front door to the rest of the hospital. Arguably, this would make the ED an ideal environment for opportunistic alcohol screening and brief intervention. Yet, despite the ever growing number of alcohol presentations and increased resource demand on EDs, there is no formal screening / intervention that is routinely employed within this environment (Forsythe & Lee, 2012).

Given the significance of ED in potentially addressing this issue, this research will seek to explore the impact that a nurse delivered telephone based brief intervention with accompanying targeted literature around the impact of excessive alcohol consumption will have on alcohol use amongst young people attending the Waikato ED. This research will add valuable knowledge to the New Zealand body of literature, which is at this stage very limited. The research will address the following questions:

1. What is the impact of a targeted literature pack and telephone brief intervention in reducing self-reported alcohol consumption rates in young people attending the Waikato ED?
2. Is a nurse-led intervention an appropriate and efficient use of resources?
Chapter II: Literature review

“The greatest part of a writer’s time is spent in reading, in order to write: a man will turn over half a library to make one book.”

Samuel Johnson

2.0 Introduction
Alcohol is a substance known as a sedative hypnotic drug (Kuhn, Swartzwelder, & Wilson, 2008). It has been shown to have certain health benefits when consumed in moderation, but equally so has been shown to have significantly detrimental effects on an individual’s health and wellbeing when consumed in excess, particularly when consumed in excess on a regular basis. This chapter will explore the literature surrounding both the benefits and dangers of alcohol ingestion, the role the health sector has in regulating alcohol intake on a population basis, what brief intervention means, and will discuss the efficacy of brief interventions in populations identified as being ‘at risk drinkers’. The chapter will conclude with an outline of the gaps found in the literature and the resulting research question.

2.1 Literature search
A search of the databases Medline, CINAHL, Pubmed, and Google Scholar revealed a vast array of literature pertaining to alcohol, the following search terms and key words were used. The terms alcohol, alcohol drinking, and alcohol* were used to identify articles that focussed on the consumable form of alcohol, namely ethyl alcohol or ethanol, and described the term alcohol drinking. Alcoholic intoxication, behavio#r*, binge, binge drink*, binge drinking, drink*, drinking behaviour, excessive, excessive alcohol and intox* revealed articles focussed on the culture of alcohol consumption, and drinking boundaries or lack thereof. Interestingly, these key words collectively identified numerous animal research assignments, and thus were refined further by selecting ‘human participants’ and the age group 19-24. These articles described the patterns shaping consumption of alcohol in today’s society. Using the search terms health and impact, combined with the aforementioned keyword search terms revealed articles that depicted the impact
problem drinking has on health, and excessive alcohol consumption as a disease predictor. The terms screen*, brief, intervention and mass screening, paired with the alcohol subset provided a vast body of literature pertaining to the extensive variety of screening and brief intervention tools. The addition of emergency, emergency medical services, room, department, services, and accident and emergency paired with the brief intervention in alcohol narrowed the scope to the emergency setting. Interestingly, when the keywords interview*, interviews as topic, telephone, telephone interview*, delivered, led, nurse, nurse delivered, nurse led, and nurs* were paired with the brief interventions in the emergency setting, there was very little data. Numerous nurse led initiatives had been pursued in a number of fields including cardiac rehabilitation, but there was no nurse initiated screening and brief intervention programmes running through emergency departments identified in the literature. Although an expansive body of literature relevant to the topic was found, literature pertaining directly to New Zealand was lacking and as such only three articles were identified that had reference to New Zealand emergency departments. The following text will review the articles identified as pertinent to this research.

2.2 The physiology of alcohol

Ethanol or ethyl alcohol is the psychoactive sedative hypnotic agent in alcoholic beverages (Kuhn et al., 2008). Alcohol is absorbed via the gut into the bloodstream and rapidly distributed throughout the body, affecting every organ it passes through. Consumed in small quantities, alcohol has been shown to have protective properties related to the cardiovascular system. Whilst both red wine and vodka were shown to have short-term cardiovascular benefits attributed to the ethanol content, red wine was shown to specifically enhance the function of the micro-vessels. The component responsible for the vessel protection was the polyphenol in the red wine. The polyphenol counteracts the negative consequences of a diet too high in cholesterols and sugar by enhancing endothelial function (Lassaletta et al., 2012). Thus, alcohol consumed in moderation can have health benefits; however alcohol consumed in excess is dangerous to every organ in the body, and impacts on personal, family and societal levels of functioning.
As alcohol is so readily absorbed into the bloodstream, it is distributed throughout
the entire body very rapidly, and starts to take effect within 5 to 10 minutes. The
peak blood alcohol concentration (BAC) occurs within 30 to 90 minutes (Lohr,
2005). Alcohol is metabolised by the liver, where it is converted into carbon
dioxide and water, and excreted through the lungs, kidneys and sweat glands (Lohr, 2005;
Schuckit, 2005). However, the liver can only metabolise approximately one standard
drink per hour. Consequently, when alcohol is consumed at a rate faster than the
liver can metabolise and excrete, the individual starts to feel intoxicated or drunk.
The more the person drinks and the liver cannot metabolise, the more intoxicated
the person feels. As the BAC rises accordingly, so do the outward expressions of
intoxication including but not limited to: slurred speech; sexual dis-inhibition;
talkativeness; argumentativeness; shyness; blurred vision; relaxation; some loss in
motor coordination; impaired judgements and concentration; unsteady gait; nausea
and vomiting; memory loss; drowsiness; respiratory depression; and in severe cases,
coma and possibly death (Brust, 2005; Lohr, 2005; Vonghia et al., 2008).

Numerous factors influence the symptoms of an increased BAC and not every
individual will react the same way when drinking alcohol. These factors include but
are not limited to: whether the person has eaten prior to drinking; the amount and
type of beverage consumed; the alcohol concentration in the beverage; the persons
size and weight; ; their genetic make-up, and thus the liver’s ability to break down the
alcohol; gender; age; ethnicity; and frequency of alcohol consumption (Kuhn et al.,
2008).

Alcohol impacts on every organ in the body; increasing the incidence of cancer, heart
disease, stroke, hepatitis, pancreatitis, injury and up to 60 other conditions (World
Health Organization, 2007). The facts remain that alcohol consumed in moderation
can have beneficial effects, whilst alcohol consumed in excess on a regular basis leads
to multifaceted detriments to health and wellbeing.

2.3 The culture of alcohol

With such diffuse harmful effects as outlined above, it is hard to fathom how binge
drinking has become an accepted norm in numerous countries around the world.
The culture of alcohol consumption that has evolved worldwide considers that binge drinking is normal. Demographically, the key points to note concerning alcohol consumption are that age, gender and socio-economic status affect how, when and how much alcohol is consumed. Due to a higher fat to water ratio and less of the required enzymes to metabolise alcohol, women have higher BAC after consuming the same amount of alcohol as men, thus feel intoxicated faster (Lohr, 2005). Comparatively, men are more likely to consume alcohol at a higher level than women, and are more likely to drink daily or weekly, and drink more heavily and more often than women (Schuckit, 2005). Thus men are more susceptible to assault and other drinking related harms. Statistically, men represent a greater proportion of alcohol related deaths than women. In regards to age cross sections, young adults are greatly affected by alcohol intake. Young people are particularly susceptible to the negative effects of drinking on the brain in terms of memory and learning, as the brain continues to grow and develop through the teenage years and into the third decade (Law Commission, 2010). Young people are at increased risk for harms associated with drinking in excess such as financial losses, assault, accident, injury, arrest, effects on study, work and social life, and unwanted or unprotected sex (Law Commission, 2010; Ministry of Health, 2009; Ministry of Youth Development, n.d.).

Today’s generation of young people\(^1\) are very different from the generations before. A New Zealand study (Ministry of Youth Development, n.d.) explains that young people today are growing up with very different family relationships, for example blended or step families, as well as single parent families. They are also more culturally diverse than previous generations, having grown up with exposure to differing cultures through schooling and extra-curricular groups. The previously gender specific roles and responsibilities are now more fluid, giving young people more opportunities and choices. Also significantly changed is when young people transition from home to entering study or the workforce, and even becoming a parent themselves. The younger generation of today are far more likely to participate in tertiary education, and are also more likely to combine working and studying

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\(^1\) Defined by UNESCO as 16 to 24 years of age
concurrently. Thus, young people have different stressors than the previous generation. The younger generation also have more access to social drinking opportunities such as universities, social work drinks and sports occasions; termed through the literature as the “opportunity structure” (Bernstein et al., 2010, p 900). Thus, with different stressors and easier access to alcohol, it should come as no surprise that young people are reporting triple the binge drinking than other age cross sections, as is shown below in Table 2-1. As previously outlined, drinking alcohol in moderation can be beneficial, but the culture that has developed that idolises intoxication is one that is harmful, unhealthy and unsustainable long term.

2.4 Alcohol, a growing problem

2.4.1 Demographics

Harmful drinking is a problem of pandemic proportion worldwide (Charalambous, 2002; Lee & Forsythe, 2011). The New Zealand Alcohol Advisory guidelines define harmful drinking as five or more units of alcohol for males, and four or more units of alcohol for females in a single drinking session (ALAC, 2013). The development of this culture of excess alcohol consumption has affected certain demographic populations more than others. Table 2-1 illustrates the age groups identifying themselves as drinking to excess. Alarmingly, the young adult population group aged 18 to 24 years of age are drinking up to triple the amount that the next highest group are drinking; which is the age bracket immediately following, the 25 to 34 year old cross section. The section including the 35 to 44 year olds had the second lowest consumption rate, and the groups reporting the least excess consumption were the youngest group of 12 to 17 year olds, the 45 to 54 years olds and the 55 to 65 year olds subsets who reported between 5 to 10 percent of the population drinking to excess.
Table 2-1: Percentage of population drinking to excess in a self-reported study, modified from Ministry of Youth Development (n.d.)

<table>
<thead>
<tr>
<th>Age of participants in years</th>
<th>% of NZ population drinking to excess</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-17</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>18-24</td>
<td>28-30%</td>
</tr>
<tr>
<td>25-34</td>
<td>10-12%</td>
</tr>
<tr>
<td>35-44</td>
<td>10%</td>
</tr>
<tr>
<td>45-54</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>55-65</td>
<td>5%</td>
</tr>
</tbody>
</table>

Globally, 2.5 million deaths were directly attributable to alcohol intake in the year 2004, which accounted for 3.8 percent of all deaths; making harmful drinking the third ‘leading risk-factor’ for disability and mortality (Monteiro, 2011; Shield et al., 2013). The social cost associated with increased alcohol consumption is ever growing as the mortality and morbidity rates rise. Contributing to increased costs is the demand on the health system including increased demands on emergency services, overcrowding of emergency departments, increased hospital admissions, increasing numbers of acute medical and surgical emergencies related to alcohol consumption, increases in motor vehicle accidents and increased demand on mental health services.

2.4.2 Effects on mental health

Exposure to an ‘alcohol-fuelled’ environment leads to intricate, multifaceted patterns of family dysfunction and social disruption (Afifi et al., 2008; Christoffersen & Soothill, 2003; Popova, Giesbrecht, Bekmuradov, & Patra, 2009; Rossow, 2000). Harmful drinking pre-empts numerous social issues including: decreased number of days worked in the financial year and thus financial stress; loss of family and friends; violence and aggression; injury to self/others; disease progression; child abuse and neglect; attempted and completed suicide; drink driving and consequently injury / death (Rossow, 2000). Harmful drinking is one of the causal factors for an increasing number of ED attendances and hospital admissions annually; with the mental health system particularly resource challenged due to alcohol related presentations (Charalambous, 2002; Lee & Forsythe, 2011).
Problem drinking has a ripple effect with the initial personal burden fast spiralling to affect the individual’s wider family and social network, and as such the ED is seeing a growing number of alcohol related mental health presentations annually. A literature review conducted by Taylor et al. (2010) revealed the following impacts of harmful alcohol consumption on mental health: an increase in suicidal ideation; the increased likelihood of attempting suicide with long term alcohol abuse; and similarly the increased likelihood of a family member/spouse attempting suicide related to the said alcohol consumption. The statistics for alcohol related suicide attempts differed from the general population in that suicide rates were two to three times higher in males of the general population; however, in the hazardous drinking population, suicide rates were relatively equal between males / females. ED attendances due to attempted suicide are ever increasing, especially in young girls between the ages of 14 and 20 who are clinically intoxicated (Rossow, 2000).

A review undertaken by Taylor et al. (2010) also revealed that in individuals who had the tendency to be aggressive or violent whilst sober, alcohol not only amplified this aggression, but also disinhibited the individual to the point of being verbally, physically and sexually aggressive. This placed family members such as partners and children at risk of verbal, physical and sexual assault and battery, and also put the intoxicated person at risk of becoming the victim of aggression or violence. Conflicting reports on the risk of child abuse and neglect were noted, although some correlations found, further empirical evidence is needed to support the assumptions. Reportedly, rates of child abuse, neglect and spousal / partner abuse rose in accordance with both the length and severity of alcohol use; family violence was reported to be higher amongst lower socio-economic alcohol users (Rossow, 2000).

Children were found to be at greater risk of developing hyperactivity disorders, as well as emotional and behavioural disorders when exposed to an environment that promotes drinking to excess on a regular basis. Subsequent to the alcohol exposure, these children were also at higher risk of going on to develop their own alcohol dependence issues later in life (Taylor et al., 2010). This spiralling effect sees these
children become the aforementioned ED patients themselves in later life, keeping the cycle of alcohol use and abuse in motion. Alcohol is a well-known contributing factor to a number of mental health disorders including alcohol use disorder, substance induced psychosis, and substance use disorders. Alcohol use disorder is amongst the five mental illnesses with the highest disease burden (Ratnasingham et al., 2013). The increased prevalence, longevity and age of onset of these conditions have the potential to be dramatically reduced with targeted screening and brief interventions in a timely and appropriate manner. An ideal environment to be introducing the message about decreasing alcohol intake is in the supported environment under the mental health umbrella either as an inpatient or in the community. Patients identified as having an alcohol use disorder may be seen by the mental health service within their visit to the ED. Thus research needs to focus on preventive strategies to reduce health risk, especially as these are avoidable risk factors and conditions (Ratnasingham et al., 2013). Alcohol is not only a key contributor to these mental health disorders, but places exorbitant physical strain on the body leading to a number of also preventable diseases, conditions and avoidable situations.

2.4.3 Effects on physical health

Alcohol intake is known to not only be a contributor to, but a key factor in causing some of the most common preventable diseases; over 60 different diseases are directly relatable to alcohol consumption (World Health Organization, 2007). When consumed in excess on a regular basis, alcohol has the following effects on the body: anaemia; blood clotting disorders; lowered immune system; increased risk of post-surgical infection; burns; trauma; meningitis; pneumonia; bronchitis; hepatitis C infection; tuberculosis; osteoporosis; gout; osteonecrosis; muscle atrophy; alcoholic blackout (memory loss from drinking sessions); thiamine deficiency – which poses the risk of life threatening complications; alcohol induced dementia; psychosis; loss of coordination and balance leading to increased falls and decreased independence; peripheral neuropathy; nerve pain; epilepsy; sleep disturbance; haemorrhagic and ischaemic stroke; breast cancer; visual disturbances; coronary artery disease; heart failure; arrhythmias; cardiomyopathy; hypertension; bowel cancers; malnutrition secondary to damage to the gastric system; dehydration; differing liver diseases
including but not limited to alcoholic hepatitis, fatty liver, cirrhosis, cancer and liver failure; alcohol dependence disorders; increased risk of self-harm and suicide attempts; mood disorders including anxiety, psychosis and depression; cancer of the throat, voice-box and mouth; hypoglycaemia and the critical complications thereof; pancreatitis; impotence; decreased libido; reduced fertility; amenorrhoea and miscarriage (in women); as well as foetal spectrum disorders for the unborn child; still birth; premature delivery and low birth weight; increased weight for intermittent drinkers and weight loss in chronic alcoholics due to malnourishment and nutrient deprivation; gastritis; nausea and vomiting; heartburn; oesophageal cancer; varicose veins of the stomach and oesophagus, which if burst can cause catastrophic haemorrhage and death; reactions with prescribed and over the counter medications; unstable blood sugars in diabetics; alcohol poisoning; acute respiratory depression; unconsciousness and death (Brust, 2005; Lohr, 2005; Vonghia et al., 2008).

The impact of alcohol on the behaviour of an individual is what increases the risk of alcohol related injury. The risk of being injured rises by 50 percent in the six hours post drinking the recommended maximum of four standard drinks, and for each subsequent drink during the same occasion, the risk continues to rise (National Health and Medical Research Council, 2009; Williams, Mohsin, Weber, Jalaludin, & Crozier, 2009). Common alcohol related injuries and fatalities include motor vehicle accidents, burns, falls, drowning and assaults (Rehm, 2009). The same principle can be attributed to the risk (for women) of developing breast cancer; long term alcohol consumption is a risk factor in developing breast cancer and the risk increases accordingly with the frequency and amount of alcohol consumed. Similarly, the risk for developing cancers of the throat, mouth and voice box are increased by 50 to 60 percent with regular consumption of alcohol. The mortality and morbidity statistics from these diseases contribute to an ever-increasing body of evidence illustrating the harm of increased alcohol intake. Alarmingly, the true social cost of alcohol related diseases is not truly known as the extent of the effects of alcohol are still being discovered.

A leading cause for mortality and morbidity worldwide is alcohol related liver diseases. One study found that over one million deaths were directly attributable to
alcohol related liver cirrhosis, and a further 752,100 deaths were related to cancers of the liver (Rehm, Samokhvalov, & Shield, 2013). The article goes on to discuss the impact of disability-adjusted life years (DALYs), not only on individuals and their families, but the ever-growing health cost associated with these DALYs. In comparison, alcoholic liver cancers accounted for 80,600 deaths in 2010, which impacts hugely on health expenditure; and DALYs lost totalled 2,142,000. The impact of these multi-million DALYs on the health dollar must also be taken into account when assessing the impact alcohol has on health expenditure.

The World Health Organization’s (WHO) definition is “one lost DALY is one lost year of healthy life” (World Health Organization, 2014). Thus, the notion of DALYs also includes the management of the disability; for example: General Practitioner (GP) attendances; missed days of work; in some cases Accident Claims Corporation (ACC) or health / surgical insurance claims; ED attendances; hospital admissions; modification of lifestyle and living arrangements; impact on leisure activities and impact on other facets of health and wellbeing. Alcohol was found to be the biggest risk factor for 10 to 24 years olds for DALYs (Rehm et al., 2013). When assessing the impact of these DALYs on a population basis, the disease burden can be simply described as the measure separating the existing health status, and the perfect health situation whereby the whole population lives free of disability and disease to an advanced age. Thus, the concept of evaluating the global burden of disease associated with harmful alcohol consumption would be very difficult to accurately define; partly because the effects of alcohol on the body and long term health are still being discovered, and partly because of the difficulty in definitively linking the personal health cost of excessive drinking and the governmental health expenditure related to this.

The fact remains that the effects of harmful drinking are preventable, and thus the push must be made to promote the message that drinking to excess is unnecessary, dangerous, and has prolonged impacts on the individual, family and society as a whole. One particularly vulnerable group that suffers the effects of drinking to excess is the unborn child. Perinatal exposure to alcohol is the foremost cause of preventable birth defects, developmental delay/disability and cognitive deficits.
Alarmingly close to 50 percent of pregnancies are not planned, thus although women may stop drinking alcohol once they find out they are pregnant, their developing foetus may have already been exposed to significant levels of alcohol via the placental (maternal) blood supply. Alcohol is currently the leading behavioural teratogen, causing significant problems for the child across the lifespan (Giliberti, Mohan, Brown, & Gauthier, 2013). These problems are grouped together in what is called the Foetal Alcohol Spectrum Disorders (FASD). Extreme premature delivery is 35 times more likely when the mother has consumed alcohol during pregnancy, as well as the effects on normal growth and development both physically and cognitively, childhood behaviour and learning, impaired lung function (delayed lung maturation, reduced surfactant production, suppression of pro-inflammatory cytokines), decreased pulmonary and general immunity, and effects on the reproductive system (Giliberti et al., 2013).

The majority of infants that have been exposed to alcohol in utero do not display the widely recognised phenotypic differences when they are born, and as such the effects of FASD are only recognised and diagnosed in later childhood. Awareness of the potential for FASD currently relies heavily on maternal reporting of alcohol consumption, and one study revealed that 100 percent of cases of FASD went undiagnosed (Giliberti et al., 2013).

Women in lower socio-economic environments are more likely to fall pregnant at a younger age. Statistically, New Zealand has the second highest rate of teen pregnancy in the Organisation for Economic Co-operation and Development (OECD), the vast majority of which are unplanned. Furthermore, these statistics also revealed that of these teen pregnancies, up to two thirds of the mothers were aged 18 or 19. Thus, just under four and a half thousand live births were due to teenage pregnancy in the year 2010 (Families Commission, 2011). Alarmingly, the correlation between the results from Table 2-1, which indicated that the 18 to 24 age bracket consumed alcohol to excess most regularly, and these statistics showing New Zealand’s elevated rates of teen pregnancy, of which the majority are unplanned, is gravely concerning for the future health system (Allen, 2012; Statistics, 2004; Zodgekar, 2012).
Emergency and acute care departments have been observing for some time a growing number of assault related injuries; particularly individuals targeted at house parties or in town drinking, and individuals experiencing intimate partner violence and family violence being brought in for treatment as a result of their intoxication by the police, especially at the weekends. This places strain on a department already under pressure, and puts the health and safety of other patients and staff at risk. This illustrates the urgent need for a change in alcohol consumption behaviours through education, especially to vulnerable groups such as pregnant women.

2.5 Conclusion

Harmful alcohol consumption is a significant and concerning social issue. Demographically speaking, the age group most at risk in regards to binge drinking is the 18-24 age bracket, who report triple the excess consumption of other age brackets. As more is researched into the extensive effects alcohol has in terms of health, wellbeing and lifestyle, more and more detriments are being discovered in regards to individuals and their quality of life. Nonetheless, the current body of literature supports the notion that alcohol consumed in moderation can have certain health benefits, but that alcohol consumed in excess is a danger to the public health and wellbeing of our society as a whole. Globally, alcohol has been shown to be a major contributing factor to disease formation and progression, and yet remains a popular social catalyst; which begs the question, does NZ have a problem with social alcohol consumption and what can be done about this?

2.6 The New Zealand burden of problem drinking

The New Zealand binge drinking culture focuses on alcohol as a social catalyst, a staple to social gatherings; the embodiment of social binge drinking is embedded in the gendered social environment, and stands no longer as an individual rational choice (Lyons, Emslie, & Hunt, 2014). Young adults are particularly likely to be ingrained in this culture of excessive alcohol consumption and binge drinking to the point of intoxication (Hingson, Heeren, Edwards, & Saitz, 2012; Imlach Gunasekara et al., 2011). Binge drinking is defined as consuming more than the recommended
five units for males and four units for females in a single drinking session (ALAC, 2013). Tertiary education institutions are only one example of a social setting in which binge drinking is encouraged by peers and has become the social norm; students in tertiary accommodation (university halls) are more likely to drink to excess compared to their peers in flats and home environments. One study showed that New Zealand Māori self-reported more frequent instances of binge drinking than New Zealand Europeans reported, and binge drinking was more common in the 15 to 24 age group (Jatrana, Carter, McKenzie, & Wilson, 2011). Other factors that influenced the rates of binge drinking included marital status, where those who had never been married reported more frequent binge drinking episodes than those who were married; educational qualification, where as the level of education declined, the level of binge drinking increased; and finally the geographical location, for instance as the area of deprivation increased, so did the episodes of binge drinking.

It is instances of excessive drinking such as these that increase the risk of injury and illness, and subsequently ED attendances related to alcohol consumption (Imlach Gunasekara et al., 2011).

Table 2-2 illustrates the alarming rate in which alcohol affects an individual’s judgements. The three columns compare the percentage of self-reported effects of excess drinking in young Māori New Zealanders in three categories, no binge drinking, binge drinking and extreme binge drinking. Binge drinking was defined as five to nine standard drinks in a four hour drinking session, and extreme binge drinking was defined as ten or more standard drinks in the same timeframe.
Table 2-2: Percentage of binge drinking and its effects amongst New Zealand Māori youth, modified from Clark et al., (2013)

<table>
<thead>
<tr>
<th>Effects of drinking</th>
<th>Non binge drinking</th>
<th>Binge drinking</th>
<th>Extreme binge drinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friends/family telling to cut down</td>
<td>15%</td>
<td>20%</td>
<td>65%</td>
</tr>
<tr>
<td>School grades affected</td>
<td>&lt;5%</td>
<td>15%</td>
<td>25%</td>
</tr>
<tr>
<td>Had unprotected sex</td>
<td>15%</td>
<td>25%</td>
<td>45%</td>
</tr>
<tr>
<td>Had unwanted sex</td>
<td>5%</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>Disinhibited to point of serious danger</td>
<td>15%</td>
<td>30%</td>
<td>45%</td>
</tr>
<tr>
<td>Injured during intoxication</td>
<td>10%</td>
<td>30%</td>
<td>45%</td>
</tr>
<tr>
<td>Injury requiring treatment</td>
<td>&lt;5%</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Harmed somebody else</td>
<td>5%</td>
<td>10%</td>
<td>30%</td>
</tr>
<tr>
<td>Involved in car accident</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

The first and second column show the immediate effects in terms of family members intervening by identifying that there is a problem with the individual’s drinking behaviours, and the effects that binge drinking has on performance at school. These statistics are very concerning given that in the academic year of 2013, only 44.3 percent of New Zealand Māori year 13s gained their NCEA level three and university entrance qualification (New Zealand Qualifications Authority, 2014); thus according to the above table, 25 percent of those not achieving their educational qualifications may have been due to problem drinking. The pregnancy rates for New Zealand Māori teens show that pregnancy rates are three times higher, and birth rates are five times higher than for New Zealand European teens (Families Commission, 2011). As is shown in Table 2-2 binge drinking resulted in 15 to 45 percent of youth engaging in unprotected sex, and 5 to 15 percent engaging in sex that they had not wanted to. Thus the results indicate a correlation between alcohol use and higher rates of teen pregnancy. Alcohol is known to alter behaviour, however the reported
dis-inhibition to the point of serious danger is gravely concerning. Such events lead to injuries that contribute to serious and lasting impacts on the individual’s future lifestyle, family and wellbeing. The reported 10 to 45 percent of individuals injured during intoxication, the 10 to 45 percent of individuals whose injuries required treatment and the 5 to 30 percent who injured somebody else during intoxication relate directly back to the aforementioned dis-inhibition to the point of serious danger; increasing the demand on emergency services and EDs. These intoxicated individuals put themselves in harms way, where if they were sober they would not get into the same situations. For example it is estimated in New Zealand that between 600 and 1000 fatalities a year are due to alcohol; and over half of these are from injuries (Berl, 2009; Connor, Kydd, Shield, & Rehm, 2005). The New Zealand Police report that one in three apprehensions are alcohol related, alcohol related crimes number over 300 per day, one in two serious violent crimes involve alcohol, and each day up to 52 people individually or as part of a group are detained or escorted home by the Police due to inebriation (New Zealand Police, 2010). In 2011, driving under the influence of alcohol and / or drugs played a significant part in 77 fatal road crashes, 360 crashes resulting in serious injuries and 970 crashes resulting in minor injuries. As a result of these crashes were 466 serious injuries, 1,435 minor injuries and 85 deaths. The New Zealand Police (2010) report that for every 100 drunken road users killed in accidents, also killed were 54 of their own passengers, and 27 sober, unrelated road users. A total of NZ$685 million was spent on these incidents; which was 22 percent of the “social cost” (Ministry of Transport, 2012, p. 1) associated with all crashes resulting in injury. Although the above table only identifies up to 5 percent involvement in road traffic accidents (RTA) related to binge drinking, a New Zealand Ministry of Transport report identifies that up to 26 percent of fatal RTA drivers had a BAC over the legal driving limit (Ministry of Transport, 2011). The New Zealand BAC limit for driving is 80mg/dL, and one standard drink per hour raises the BAC to approximately 15 to 20mg/dL (Schuckit, 2005).

Problem drinking in New Zealand is not solely a younger generation’s problem, and it is also not exclusively a Māori population problem. The above table simply illustrates one subset of the New Zealand population that reports excess drinking,
thus the problem stretches far wider than this table depicts. For example, the New Zealand sporting scene is one whose aptitude for alcohol is promoting the binge drinking culture.

New Zealand sport is plagued by a reputation for disgraced players being named in local media after a big night out drinking. The culture for excess consumption by fans and event goers is one that is getting dangerously out of control. One New Zealand based study even goes as far as to call alcohol the “Achilles heel” of sport (Gee, Jackson, & Sam, 2013, p. 4). The study highlights numerous very concerning trends associated with the culture of New Zealand sport such as the expectation of consuming alcohol at events such as the sevens tournament in Wellington, the perceived increase in entertainment value if drinking at events, the expectation of consuming more than normal, and a disregard for media messages relating to cutting down on consumption at sporting events. Alcohol was deemed a “normal part of the atmosphere” (Gee et al., 2013, p. 2) at events. An alcohol-fuelled environment paired with the emotional ties to the sporting arena contributes to the increase in injury and illness as a result of intoxication.

Alcohol related ED attendances are on the rise in New Zealand, with one ED predicting their rates of attendance between the hours of 12am to 6am relating to alcohol in up to one third of attendees (Humphrey, Casswell & Han, 2003). Injury, falls and disease management are common causes of repeat attendance to the ED, a recurring trend with alcohol related illness and injury adding to the ever increasing alcohol related health expenditure. The Waikato District Health Board (WDHB) District Strategic Plan (DSP) (2006) highlighted some key points including that 25 percent of the Waikato population is considered lower socioeconomic, that people of low socioeconomic status are more likely to die as the result of road crashes, and up to 20 percent of the population will suffer mental illness in their lifetime including substance use disorders (Waikato District Health Board, 2006) and yet no form of support is offered to this population to reduce problem alcohol intake. The opportunity that ED has in reaching out to this population is significant. A screening and brief intervention could see a decrease in health disparities for the lower socio-economic population.
2.7 Health expenditure

It is estimated that in New Zealand, between 600 and 1000 deaths a year are alcohol attributable (Berl, 2009; Connor et al., 2013), and of these deaths, 25 percent in females and 52 percent in males are due to injuries sustained whilst under the influence of alcohol (Connor et al., 2013). In terms of ED presentations, between 18 and 35 percent of attendances for injuries are due to alcohol, increasing to 60 to 70 percent on the weekends; stretching departments that are run with skeleton staffing and a relatively junior staff set (Humphrey et al., 2003; Jones, McElnay, & Robinson, 2009). An increasing number of mental health presentations are seen at EDs in New Zealand as mentioned previously, with an alarming 14 percent of the population estimated to experience a substance use disorder in their lifetime (Wells, Baxter, & Schaaf, 2007). The cost of these attendances, and all other health related facets of excess alcohol consumption and services such as the police force resourcing were estimated to have cost New Zealand “NZ$4.9 billion between 2005 to 2006”, with previous estimates stretching as high as “NZ$16.1 billion” (Law Commission, 2009, p168).

The binge drinking culture places an exorbitant strain on the emergency services, as well as at departmental and hospital levels. Physical and mental illness and injury as a direct result of alcohol ingestion contribute to a growing number of ED presentations every year; and young adult attendances are ever increasing (Balodis, Potenza, & Olmstead, 2009). Increasingly longer waits are experienced on the weekends due to alcohol related attendances; as well as the need for extra resource utilisation such as trauma management teams, mental health crisis teams and hospital security. Long-term harmful drinking leads to a number of chronic health conditions, ranging from hypertension and cardiac disease, to gastric and pancreatic disease and cancers. Akin to long-term complications, the acute intoxication phase can leave people vulnerable to physical injury which is what contributes to increased emergency attendances on weekends; fractures, lacerations, assaults, and decreased level of consciousness due to excess alcohol consumption are all common presentations (Forsythe & Lee, 2012). These acute injuries, as well as long term
complications see an ever-increasing number of alcohol related ED presentations and hospital admissions (Forsythe & Lee, 2012).

One of the New Zealand Government’s initiatives for safer, more efficient care for patients in the years 2013 and 2014 was shorter stays in the ED, which aims to have 95 percent of patients seen, referred and admitted or discharged from the ED within six hours (Ministry of Health, 2013). Alcohol related attendances hamper this initiative by increasing attendances and thus increasing resource demand, deferring resources away from other patients in the ED, longer stays in the ED for example to sober up to be safely discharged home, the need for security to pacify elevated patients, and compromising staff and other patients safety (Imlach Gunasekara et al., 2011). Patients under the influence of alcohol can be less cooperative than sober patients, thus requiring more time and attention from nursing, medical and security staff (Imlach Gunasekara et al., 2011).

The impact that excess alcohol consumption has on healthcare expenditure, as well as the social cost involved with excess alcohol consumption needs to be recognised by the healthcare system and prompt the dissemination of the message that excess alcohol consumption is not healthy, sustainable or in the best interests of society as a whole. The healthcare system has the unique opportunity to draw upon the patient’s own reflections on their drinking behaviours and patterns while in the ED. To capitalise upon this by offering a brief intervention has the potential to be feasible, cost effective and most importantly, an effective means of reducing problem drinking. A streamlined system needs to be formulated to screen, identify, and provide an appropriate intervention for individuals identified as drinking to excess. Numerous countries worldwide have implemented successful screening and brief interventions in healthcare settings, and the New Zealand staff to patient interface needs to be empowered follow suit.

With examples of the effects of binge drinking as outlined above, the questions still remain: what is the alcohol related burden on New Zealand Emergency Departments, and what opportunities can the health system capitalise on in order to
reduce the incidence of problem drinking and thus the effects it is burdening the health sector with?

2.8 Brief interventions in healthcare

The literature search identified that brief intervention ranges from motivational interviewing to interactive sessions, aimed at raising awareness of a problem, offering targeted resolution advice and support, and an action plan to reduce the stated problem (D’Onofrio et al., 2008). Brief interventions are an efficacious health promotion strategy that increase public health awareness and actively work toward reducing harmful behaviours and thus decrease injury occurrence and disease progression. Albeit dated, the article by Bien, Miller, and Tonigan (1993) found that brief intervention was up to 78 percent more successful in reducing problem drinking than referral to alcohol rehabilitation services. It was also shown that if the health professional called the alcohol rehabilitation agency and scheduled an appointment, participants were 65 percent more likely to keep the initial and subsequent appointments; where as little as five percent of patients followed up with an alcohol outpatient service when it was left up to them to make the appointment (Bien et al., 1993). Therefore, in terms of patient engagement, brief intervention is a more successful reduction strategy than referral to an alcohol rehabilitation service.

In the case of young adults, brief intervention is used as a prevention strategy to preclude the development of chronic harmful drinking patterns. Heather (2012) argues that the public health benefits for using a brief intervention strategy are immense in that the key is early intervention prior to the development of chronic harmful drinking patterns that become entrenched in the persons social identity. This not only reduces the person’s risk of alcohol related disease progression and injury, but prevents the need for intensive addiction intervention services in the future. It is also noted that even if the person chooses not to act immediately on the information they have been given about a healthier lifestyle, it provides the basis for individual’s to contemplate their current health and lifestyle choices, assessing the need for modification (Heather, 2012). The specific thinking pattern argued is termed the trans-theoretical model of change (TTM). The TTM consists of six phases of thinking and are: pre-contemplation; contemplation; determination; action;
relapse; and maintenance (Glanz, Rimer, & Viswanath, 2008). Brief intervention works most effectively at either the pre-contemplation or the contemplation phase. The pre-contemplation phase sees the introduction of a new concept to the individual which may or may not be acted upon; the contemplation stage is when the individual starts to process the information given and sees the validity of the concept, and thus contemplates making change. Hence, the person may not reduce drinking immediately but over time may re-evaluate their drinking patterns and initiate changes toward drinking at a safer level. Nilsen et al. (2008) highlight that patients who are injured (as the result of intoxication) are at increased sensitivity to receiving information about the dangers of alcohol and strategies to reduce alcohol consumption. In this study these patients were young, thus making it easier to identify harmful drinking patterns at an earlier stage and intervene. The article conceptualised the “teachable moment” (Nilsen et al., 2008, p 185) whereby the patient comes to the realisation that alcohol was a direct contributing factor in their injury, and they consider the need to change their drinking patterns (Nilsen et al., 2008). Similarly, D’Onofrio et al. (2008) found that as long as direct information was given regarding the role alcohol played in the patient’s ED visit, the patient cut down on harmful drinking. It was argued that it did not matter whether this came in the form of a brief intervention or scripted discharge instructions, as long as there was specific mention of problem drinking and strategies given to help to reduce this, both study groups (control and manipulation) showed a reduction in problem drinking (D’Onofrio et al., 2008).

Arguably, a brief intervention can range from a face to face motivational interview, to a telephone consultation post the patients ED visit, or an interactive session (usually performed on a computer)(Gmel, Gaume, Bertholet, & Daeppen, 2012; Terrell et al., 2008; Wutzke, Conigrave, Saunders, & Hall, 2002). However, what most research and review articles agree on is that the brief intervention should include the use of the FRAMES model (Bien et al., 1993; Cunningham et al., 2009; D’Onofrio et al., 2008; Forsythe & Lee, 2012). FRAMES stands for feedback, responsibility, advice, menu, empathy, and self-efficacy. The use of FRAMES ensures that information is uniform, but also individualised; thus meeting procedural guidelines and the needs of the individual. The use of a FRAMES guided brief intervention means that a patient
does not necessarily have to attend a rehabilitation programme. This has been proven to be more synonymous with successful attempts in reducing problem drinking (Bien et al., 1993; Cunningham et al., 2009; D’Onofrio et al., 2008; Forsythe & Lee, 2012). Bien et al. (1993) and Cunningham et al. (2009) do not disregard alcohol rehabilitation services, but merely highlight the growing need for differential services too. At present the demand for alcohol addiction services far exceeds the services available. Thus, if a successful brief intervention can be developed, a far greater number of patients in need of treatment will be reached, reducing the need for more intensive services and consequently, the public health cost of problem drinking.

The implications of the current binge drinking culture for the future of the health system are grave, and thus a uniform screening and brief intervention tool needs to be implemented New Zealand wide. There is no body of literature discussing whom the responsibility for regulating alcohol falls under between government and healthcare. However, given the critical concerns for the implications the current drinking culture places on the healthcare system, it is arguably an area worth investing in to reduce the future implications by the current and future health systems.

2.9 Brief interventions in the ED targeting alcohol

Acute and emergency care worldwide form the main access point for all illness and injury needing secondary care and consequently ED acts as the front door to the rest of the hospital. Arguably, this would make the ED an ideal environment for opportunistic alcohol screening and brief intervention. Notwithstanding, primary care is the optimal environment for alcohol screening and brief intervention due to the existing rapport between healthcare professional and patient, a more relaxed consultation and because the focus can be directed more toward preventative care and health promotion (McCormick et al., 2006). However, due to the personal expense associated with a general practitioner consultation, the ED remains the main access point for the majority of intoxicated patients, or patients injured during intoxication accessing care; and thus has the potential to become the ideal environment for health promotion and alcohol screening. Albeit a department
focussed on emergency care, there is undoubtedly the opportunity to develop nursing practise to incorporate alcohol screening and brief intervention similar to the development of the smoking cessation initiative in the ED. Nilsen et al. (2008) argues that due to the sheer number of alcohol related ED visits (namely injuries), and the public health cost of these injuries, the ED should be routinely screening and offering a brief intervention as part of standard care. Numerous studies also highlight that patients who present to the ED as opposed to going to their general practitioners are more inclined to report higher alcohol consumption, alcohol addiction and adverse effects of harmful drinking (Forsythe & Lee, 2012; Nilsen et al., 2008). Forsythe & Lee (2012) argue that this is because patients who are attending the ED engage in drinking on a more regular basis than those who attend primary care; no mention of this is noted in Nilsen et al. (2008). Regardless of this incidence, brief interventions aim to reduce alcohol intake, not stop drinking altogether. Thus the intended therapeutic effect is not abstinence from alcohol consumption, rather to minimise harmful drinking behaviours such as binge drinking and drink driving (Bien et al., 1993; Nilsen et al., 2008).

Chou et al. (2012) looked at the effectiveness of a screening tool implemented at triage; similar to the smoking cessation initiative, to be followed up in the patient’s episode of care. It was found to be a cost effective, modest investment of time and resource that triage nurses were able to carry out effectively. The validity of such a tool is yet to be tested in New Zealand, and findings of this research may not correlate with New Zealand culture as it was undertaken in South Korea with the specific aim of gathering data about South Korea and Asia. However, this is not to say that a similar tool could not be implemented successfully within EDs in New Zealand. New Zealand’s alcohol data collection relating to ED presentations is relatively new and vastly incomplete, however a Wellington region based research piece revealed that between the ages of 14-65, one in two New Zealanders (based in Wellington) drink alcohol excessively (Humphrey et al., 2003). Interestingly, this research piece defined excess alcohol as six or more standard drinks for females and eight or more standard drinks for males in one drinking session; where the ALAC (as discussed previously) defines it as four and five standard drinks for females and males respectively. Thus, what this research piece terms as ‘excessive’ is already far
exceeding the New Zealand ALAC guidelines for alcohol consumption. The article also stipulates that between the ages of 12-19yrs, three out of four teens are drinking in excess on every drinking occasion; and as such a rise in ED visits has been seen in this age group. Thus as mentioned previously, there is a definite benefit in offering a brief intervention in the ED to this population in which alcohol is a direct contributing factor to their injury / illness and subsequent attendance. This is partly due to the ‘increased receptivity’ of patients who are injured as was shown in Nilsen et al. (2008). Although intoxicated patients may show an increased receptivity toward changing behaviour, the perception of these patients by healthcare professionals often hampers standards of care delivered.

Standards of care for intoxicated patients in the ED were analysed in a study that highlighted that some patients receive suboptimal care because of their intoxication (Imlach Gunasekara et al., 2011). Often this was due to the perception staff had of the intoxicated patient, and that negative past experiences of verbal and other assault made healthcare professionals weary of inebriated patients (Imlach Gunasekara et al., 2011). It was also noted, that an increase in intoxicated patients meant longer wait times for patients and increased workload for staff. Thus concluding that the quality of care and safety for ED patients and staff was compromised when alcohol related attendances increased.

Professionalism and duty of care maintain that a patient in need of treatment must receive timely and appropriate treatment despite their disposition, so what other barriers stop patients receiving a brief intervention in the ED? A qualitative study, where researchers were careful to use open-ended questions to analyse the words of staff verbatim, found some key themes about alcohol and ED patients. Evidence depicted that health practitioners felt they could not undertake screening and brief intervention for three key reasons. Firstly, staff felt embarrassed asking about their patient’s alcohol intake. Even when directly confronted with an injury caused by intoxication, documented several times is the fact that health professionals felt it was not their place to ask about their patient’s alcohol intake, much less to engage in health promotion around safe drinking (Lock, Kaner, Lamont, & Bond, 2002; McCormick et al., 2006). This concept of health professionals feeling as if they are
prying into their patient’s lives was well documented in research about smoking cessation. Earlier qualitative studies demonstrated that before smoking cessation became a Ministry of Health (MoH) target in New Zealand, health professionals felt they were prying if they asked a patient whether they were a smoker; even though the negative health benefits were clearly documented about smoking, it took a ministerial drive for it to become policy and then part of routine practise in New Zealand healthcare.

One study describes audiotaped visits where the health practitioner was audibly awkward when alcohol was mentioned by the patient as being a problem, the health practitioner was stuttering, and tried to divert or finish the conversation rather than exploring the patient’s disclosure (McCormick et al., 2006). The article suggested advice for alcohol could be condensed into a similar format as smoking cessation advice. Such advice includes the ABC format, where the patient is asked, given brief advice and cessation support, a time effective means of exploring their perception of the problem, and willingness to change. Secondly, providers felt they were ill equipped to undertake screening and brief intervention. Specifically noted was their lack of training. In the study, nurses reported feeling that they were not trained to undertake screening or brief intervention for alcohol; medical staff alike reported not knowing what to do when a patient disclosed about harmful drinking patterns, and were more likely to stop the conversation, laugh, or reassure the patient that their illness was not related to alcohol. The advice about alcohol (if given at all) was rushed and vague, as compared to the patient being given a specific, goal centred plan about their smoking cessation when this was discussed in the same interview (McCormick et al., 2006). This again reiterates that the smoking cessation drive which was formally an affronting topic, has over time become not only policy, but part of routine clinical health screening. Thirdly, nurses and medical staff alike mentioned that they felt that asking about alcohol consumption negatively impacted the therapeutic relationship. Building rapport is an important part of the therapeutic relationship between health professionals and patients; thus ensuring proficient care is initiated, maintained and concluded. Health professionals felt that asking about alcohol consumption would negatively impact this relationship and therefore negatively impact patient care and health outcomes.
Alcohol consumption has become an avoided subject in health consultations. With such compelling evidence that screening and brief intervention have the potential to reduce harmful drinking population-wide, as well as reduce the social cost of injury / illness, reduce the number of ED attendances, and reduce the departmental and hospital strain from alcohol burden, the question remains: how can health professionals become empowered to offer screening and brief intervention as part of standard ED practise? The answer remains largely in education, as was evident with the implementation of the smoking cessation ABC tool. Once staff have been given the signs to look for in patients, the phrases or questions to use, and reasons as to why an investment of their time is beneficial; staff engagement rates increased.

Literature regarding the use of a telephone delivered brief intervention was sparse; and as such, telephone follow-ups have not been critically analysed in this review. The information found reveals that one study utilised telephones in the delivery of their brief intervention for smoking cessation, and included weekly counselling calls to participants over a 12 week period (Ferketich et al., 2014). Numerous other articles sight the use of telephones in their follow up period, but do not deliver the brief intervention over the telephone (Khan et al., 2013; Rhodes, Rodgers, Sommers, Hanlon, & Crits-Christoph, 2014; Tsai, Tsai, Hwang, & Liu, 2011). Due to a lack of rigorous research pieces to draw upon, a timeframe of two weeks was chosen to call participants to deliver the brief intervention as based on a study by Bernstein et al. (2010). This study demonstrated that a phone call 10-days post ED attendance was successful in delivering a brief intervention to a young adult population.

### 2.10 Summary

Alcohol is the fifth leading cause of global disease burden worldwide (Chou et al., 2012) and New Zealand is by no means immune to this problem. A survey of households in New Zealand showed the one in four households were affected by problem drinking (Imlach Gunasekara et al., 2011). The negative effects of these exposures are well documented, ranging from abuse and neglect, to financial stresses, disease progression and beyond (Rossow, 2000). A study conducted in the Auckland ED in 2000 revealed that up to 67 percent of injuries between the hours of midnight
and 06:00 were directly attributable to alcohol (Humphrey et al., 2003). An increase in problem drinking in young adults is seeing an increased injury and illness burden in EDs, and hospitals; placing an exorbitant strain on the New Zealand health sector.

Not only does this increase workload, but also decreases other patient and staff safety, compromising outcomes of care for both the intoxicated and sober patient populations. One study conducted in Wellington went as far as to say that in New Zealand, alcohol was the single biggest risk factor for behavioural disruption to safety in the ED (Imlach Gunasekara et al., 2011). Currently in New Zealand there is no uniform screening and brief intervention tool, and in fact addressing alcohol problems is at the discretion of the health professional assessing the patient. This seems vastly counterproductive, as there is endless rigorous research that reinforces the benefit of offering a brief intervention as health promotion aimed at reducing problem drinking and thus reducing the demand on an already strained health system. Evidence supports the use of such a tool in the ED setting, specifically identifying that injured patients are at increased receptivity toward accepting help to make changes in their drinking behaviour (Cunningham et al., 2009; D’Onofrio et al., 2008; Forsythe & Lee, 2012; Nilsen et al., 2008).

Although the literature surrounding the burden of alcohol, the benefit of screening and brief intervention in the ED, the use of nurse-led initiatives and the success of telephone follow ups is endless; when all key words / search terms were linked on the databases mentioned previously, no articles were found. The majority of research is focussed on chronic alcoholism, and data specifically focussing on young adults is limited. There have been a number of alcohol related brief intervention studies conducted in New Zealand including the Hawkes Bay, Auckland and Wellington, but no such study has been conducted at Waikato Hospital. Thus the identified gaps in the literature have been used to formulate the following research question: “What impact does a nurse delivered telephone based brief intervention with accompanying targeted literature around the impact of excessive alcohol consumption have on alcohol use amongst young people attending the Waikato ED?”
Chapter III: Methodology

“If we knew what it was we were doing, it would not be called research, would it?”

Albert Einstein

3.0 Introduction

Methods are the planned procedures for undertaking the research; methodology is the theoretical underpinning of the methods. In particular, methodology is defined as the fundamental basis to a particular philosophical framework – in this case the positivist framework (Moule & Goodman, 2009). This chapter will explore the research paradigm; detailing the positivist framework and the quantitative research framework encompassing randomised control trials (RCTs), and statistical analysis thereof. It will also explain the intended research participants and why the findings of this group can be used to inform future practise.

3.1 Research paradigm

Nursing research encompasses a number of different frameworks; and these frameworks fit into either inductive or deductive reasoning. The inductive approach seeks to generate theory; where the deductive approach seeks to test an already established theory (Moule & Goodman, 2009). The positivist framework is considered a deductive approach as discussed below. The positivist framework refers to emergent knowledge generated through the rigorous testing of quantitative research; in short, scientific knowledge is developed by verifying facts. The positivist framework argues that there is “one truth” (Moule & Goodman, 2009, p. 172). The use of the positivist framework in health research is invaluable due to its rigorous and systematic generation and testing of new theory. Quantitative research, particularly RCTs, are considered gold standard in health research. RCTs will be explored further in section 3.3.

3.2 Quantitative research

Quantitative research considers the cause and effect relationships or observable phenomena to generate verifiable, scientific knowledge (Moule & Goodman, 2009).
Research is conducted whereby data are gathered numerically for statistical analysis. Quantitative research is undertaken in a controlled and systematic process, thus ensuring rigorous and objective data collection and analysis; and therefore verification or generation of, factual scientific knowledge. Quantitative research aims to accept or reject the hypothesis. RCTs are a subset of quantitative research in which the elements of randomisation, manipulation and control are present. These elements reduce researcher bias, ensuring rigorous data collection and analysis can be performed.

3.3 Randomised controlled trial

Historically, RCTs became gold standard in the decade beginning 1990 with the emergence of ‘evidence based practise’ (EBP). Put simply, EBP seeks to use the most up to date scientific knowledge to inform patient care and nursing practise (Moule & Goodman, 2009); with the goal of improved outcomes for patients. An RCT falls under the umbrella of quantitative research in the positivist research paradigm; thus looks at the cause and effect relationships to generate verifiable, scientific knowledge (Moule & Goodman, 2009).

An RCT is an experimental design; and as such must include the three components of randomisation, control and manipulation (Maule & Goodman, 2009). Participants are randomised into the control group, whereby no treatment or placebo is administered, and the manipulation group in which the new treatment is administered. RCTs are considered gold standard research due to the reduction in researcher bias by reducing variables using the three elements outlined above. Arguably, research can be divided up into a hierarchy of evidence, with RCTs generating evidence classified as Level II as illustrated in Table 3-1.
3.4 Researching an affronting topic

The binge drinking culture has become an accepted societal norm in New Zealand. Thus researching this topic, when the people most engrossed in it do not see it as an issue, may be challenging. In the not too distant past, the public health drive to have New Zealand Smokefree by the year 2020, and as such to make asking about smoking status part of health assessment, was met with very mixed attitudes. Initially, people were offended to be asked about their smoking status, but as education and awareness about the detriments of smoking have prevailed, the question has become routine in healthcare and people expect to be asked about their smoking status. Thus, I believe will be the case with similar health questions about alcohol consumption patterns and beliefs. A certain amount of negativity must be anticipated as with any new public health drive which targets individuals and their behaviours. However I hope to see that with the reduction in binge drinking, and thus the reduction in detrimental health and injury statistics related to alcohol consumption that become more apparent with time, will also not only demonstrate

<table>
<thead>
<tr>
<th>Classification: level of evidence</th>
<th>Research Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Evidence gained from a systematic review or meta-analysis including all relevant RCTs</td>
</tr>
<tr>
<td>II</td>
<td>Evidence gained from at least one rigorous RCT</td>
</tr>
<tr>
<td>III-1</td>
<td>Evidence gained from rigorous pseudo RCTs, i.e. alternative allocation or other such methods</td>
</tr>
<tr>
<td>III-2</td>
<td>Evidence gained from comparative research, inclusive of systematic reviews of such studies, with concomitant controls or allocation not randomised, case-control studies, cohort studies, or interrupted time series that includes a control group</td>
</tr>
<tr>
<td>III-3</td>
<td>Evidence gained from comparative research with a historical control, an interrupted time series excluding a parallel control group, or a two or more single arm studies</td>
</tr>
<tr>
<td>IV</td>
<td>Evidence gained from descriptive research including case studies with either post-test or pre-test/post-test designs</td>
</tr>
</tbody>
</table>

Table 3-1. Classification of evidence, modified from Evans (2003)
an acceptance of alcohol screening as a part of healthcare, but also a societal sense of accountability to start drinking more responsibly.

3.5 The researcher
The researcher is a registered nurse working within the ED of Waikato Hospital. Aged within the study participant bracket, the researcher hopes to be able to connect with participants in an engaging manner that puts them at ease and encourages their honest participation in the project. The researcher trained at Massey University, Palmerston North, graduating with the degree of Bachelor of Nursing and gaining the Registered Comprehensive Nurse qualification given with due authority by the New Zealand Nursing Council in the year 2011. The researcher then spent a year rural nursing across the scope of inpatient and ED nursing, and public and district health nursing. After which moving to Waikato Hospital’s ED where currently holding a .8 FTE. This research project is being completed within the Auckland University Bachelor of Nursing Honours qualification.

3.6 Summary
This chapter has outlined the methodology to undertake a quantitative research design, in particular an RCT. The theoretical underpinning of the quantitative framework – the positivist approach has been examined, and the use of the RCT as the gold standard in quantitative research has been outlined, which concludes Chapter three – Methodology. Chapter four will explore how research methods apply to this study.
Chapter IV: Methods

Science is simply common sense at its best, that is, rigidly accurate in observation, and merciless to fallacy in logic

Thomas Henry Huxley

4.0 Introduction

As outlined in chapter three, methods refer to the planned procedures to undertake the research design. This chapter will explore the research design as well as describing the statistical analyses that leads to the results outlined in more detail in the final two chapters. Specifically, this chapter will explain the intervention under investigation as well as the usual care group and research design.

4.1 Health services under investigation

The implementation of a randomised controlled trial sees two services under investigation; these are the intervention group and the usual care group.

4.1.1 The intervention group

Eligible participants randomised to the intervention group, receive treatment as required and are then discharged either home or to another ward/service for continued management. The efficacy of brief interventions in decreasing problematic drinking in young adults is documented throughout the literature; specifically, the use of motivational interviewing driving a self-change model of behavioural modification (Gmel, Gaume, Bertholet, & Daeppen, 2012). The literature illustrates the benefits of a brief intervention approach as two-fold as it is time effective for health professionals, as well as being the most efficient means of patients identifying their own alcohol consumption problem, and committing to identifying and pursuing a healthier lifestyle. The Alcohol Use Disorder Identification Tool (AUDIT) is a tool used to identify drinking behaviours and problems, giving a numerical score that health professionals can use to tailor the brief intervention to the patient’s needs based on the severity of their drinking problem.
The AUDIT is a series of questions directly related to drinking patterns, consumption, attitudes and effects. It was designed to be used to identify the existence and severity of drinking problems, however will be used in this study to capitalise on a concept identified in the literature about self-realisation that there is a drinking problem. The use of the AUDIT as a brief intervention is based upon literature that identifies a “teachable moment” (Nilsen et al., 2008, p 185) in which patients come to the realisation that their drinking put them in danger and they need to make healthier lifestyle choices. Thus, the AUDIT will be used as the brief intervention, with the usual care group being given standard Emergency Department (ED) management and discharge.

4.1.2 Usual care group
The usual care group will be participants who receive the normal ED management and treatment. These participants attend the ED either intoxicated, or have an injury related to an episode of intoxication. Participants receive the medical treatment they require and are then discharged either home or to another ward / service for continued medical management.

4.2 Research design
Members of the clinical team will identify potential participants that are over the age of 18, who are in Waikato Hospital’s ED, due to an alcohol related attendance, and who are currently sober and otherwise healthy. The clinical team members will gain consent from participants using the Patient Information Sheet (PIS) and the Consent Form (CF). Prior to randomisation assignment, both the intervention and usual care group complete the Alcohol Consumption Tool (ACT) questionnaire to ascertain baseline drinking levels. Participants are then randomised into the intervention or usual care group, using simple randomisation. Both groups are then discharged either home or to another ward / service for continued medical management. Within one week of ED discharge, participants in the intervention group will be sent
the ‘Ease up on the drink’ pack. Within two weeks of ED discharge, the researcher will telephone participants in the intervention group; they will at this point be given the brief intervention, the AUDIT (please see Appendix VII). The resulting score will decide the information given to participants (See Appendix VII for AUDIT response advice). Within six weeks of discharge from the ED, both groups will receive a telephone call from the researcher and will be given the ACT questionnaire over the phone. Data gathered from the ACT questionnaire at time points one and two will be analysed statistically as described in Section 4.6.

2 Developed by the New Zealand Alcohol Advisory Commission (ALAC), please see Appendix V
4.3 Population under investigation

Members of the clinical team will identify potential participants that are over the age of 18 who are in Waikato Hospital’s ED due to an alcohol related attendance and
who are currently sober and otherwise healthy. The clinical team members will consent participants using the PI and CF.

4.3.1 Inclusion criteria
Participants will be offered to participate in the trial if they meet the following inclusion criteria:
1. Participants are sober at time of discharge or transfer to another unit;
2. Participants have not been diagnosed with a mental health condition which is impacting on their alcohol consumption;
3. Participants are not in severe pain, intubated, sedated or receiving psychoactive medications;
4. Participants are not terminally ill;
5. Participants have access to a telephone; and
6. Participants can communicate in English.

4.3.2 Recruitment strategy
Eligible participants (as indicated by inclusion criteria) will be approached whilst still in the ED, when they are judged sober by the clinical team. The proposed research will be explained to them using the PIS, and participants will be asked if they would like to participate. If participants are willing to participate, they will be required to give written consent via the consent form.

4.3.3 Randomisation assignment
A simple randomisation technique (using sealed envelopes with enclosed assignment) will be employed to ensure equal probability of participants being assigned to each of the trial groups. The researcher will be informed of assignment to allow appropriate treatment option.

4.4 Outcome measures
The data collection period will be undertaken over three months. Data will be collected at baseline and within six weeks of ED admission.
4.4.1 Primary endpoints

Primary endpoints include seeing a self-reported reduction in problem drinking as measured by the ACT questionnaire. A reduction in both drinks per week and drinks per session will be recorded using the Alcohol Consumption Tool (Nilsen et al., 2008).

4.4.2 Secondary endpoints

Secondary endpoints include: the amount of time invested in intervention and follow up phone calls; the types of alcohol being consumed; participants knowledge about recommended maximum alcohol intake; and the AUDIT scores for the individual questions as well as the total AUDIT score. These findings identify areas to focus on in future research.

4.4.3 Power testing

Power analysis is employed to determine the minimum sample size required to detect an effect of a given size. As the power increases, the chances of a Type II error occurring decrease. The probability of a Type II error occurring is referred to as the false negative rate. The sample size in the current study is based on previous studies of reduction of alcohol consumption following short interventions for at risk young adults in ED setting (Bernstein, 2010). A reduction in the intervention group from a mean average of 5.4 units per day to 4.2 units per day with a standard deviation of 1.5 and a power of 80% would require a total of 26 participants per group.

4.5 Pilot study

The study was trialled on two participants prior to study proper. The pilot identified the time requirements for the intervention as too the recruitment process. Due to the nature of the investigation, namely the potentially incompetent nature of the participants, particular attention was placed on subject eligibility and recruitment.

4.6 Statistical considerations

A randomised controlled trial is considered gold standard research due to its ability to be statistically analysed. This research will generate numerical data from the ACT
questionnaire that gives participants a score that indicates their level of drinking. A higher number indicates problem drinking, where a lower number indicates healthier drinking patterns. Following consultation with Dr Avinesh Pilai, Senior Lecturer in Biostatistics, an independent samples \( t \)-test was identified as the optimal method of statistical enquiry.

### 4.6.1 Primary analysis

The independent \( t \)-test, also called the two-sample \( t \)-test or student's \( t \)-test, is an inferential statistical test that determines whether there is a statistically significant difference between the means in two unrelated groups.

### 4.7 Ethical considerations

Ethical approval was sought prior to the commencement of both the pilot and main study. An ethics application was submitted to the University of Auckland Ethics Committee, and was approved for three years on 11 December 2013. Ethical considerations included the potential issue of consenting patients under the influence of alcohol. The study has been ethically approved only to consent participants when judged clinically sober by the clinical team. Exclusion criteria included above are to reduce variables in the study; the study aims test the brief intervention with the lowest number of variables to ascertain the efficacy of the brief intervention in an otherwise mentally and physically well population.

### 4.8 Summary

This chapter has outlined the methods chosen to explore the impact of the brief intervention. The trial has been designed to test the feasibility of running the intervention from an ED environment. The study participants and their relevance to informing future practice have also been included.
Chapter V: Results

What we find changes who we become

Peter Morville

5.0 Introduction

This study utilised a nurse-led follow up phone call, accompanied by a targeted literature pack to assess the efficacy of the alcohol use disorder identification tool (AUDIT) as a brief intervention. The following chapter presents the results of the data collection. The data were analysed using the individual samples t-test. The findings are presented through graphs, tables and accompanying narrative.

5.1 Sample characteristics

5.1.1 Recruitment

The recruitment period began in March 2014 and lasted three months. The number of participants recruited totalled 34. The power test undertaken prior to commencement of the research indicated a minimum number of participants totalling 52. Unfortunately due to an unexpectedly high number of ineligible participants and time constraints, only 34 participants were enrolled in the study. The high refusal rate for participating in the research was another factor that contributed to a smaller than anticipated sample size. The key-contributing factor to participants being disallowed from enrolling was their state of inebriation in the ED; only sober participants were approached for consenting to the study. Of the 34 participants, one gave false details, one withdrew from the research, one declined to give contact details and six did not answer the follow up phone calls; the remaining 25 participants were successfully followed up in the study.
Figure 5-1: Consort flow diagram

Population eligible n = 102

Recruitment: Population consented n = 34

Refused n = 68

Randomised to intervention n = 17
Refused n = 1
Lost to follow up n = 2
Follow up n = 14

Randomised to usual care n = 17
Lost to follow up n = 6
Follow up n = 11
5.1.2 Demographics

Once consented, participants were randomised into control and intervention by simple envelope randomisation assignment. This chapter describes the intervention (manipulation) \( (n = 17) \), and the usual care (control) \( (n = 17) \) groups. Table 5-1 identifies the gender differentiation between the control and intervention group. The intervention group was comprised of six females and 11 males; of which their mean age was 26 with a standard deviation of 6.89. The usual care group includes five females and 12 males; whose mean age was 23, with a standard deviation of 5.31.

Table 5-1: Demographics of study participants by group

<table>
<thead>
<tr>
<th>Descriptors</th>
<th>Intervention</th>
<th>Usual care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female, n (%)</td>
<td>5 (29.41)</td>
<td>6 (35.39)</td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>12 (70.59)</td>
<td>11 (64.71)</td>
</tr>
<tr>
<td>Mean age, (SD)</td>
<td>23 (5.31)</td>
<td>26 (6.89)</td>
</tr>
</tbody>
</table>

Table 5-2 illustrates the demographic profile of the groups. The control group included participants who identified as NZ European (47.06%), Māori (41.18%), and two percent who did not identify their ethnicity. No participants identified as Pacific, Asian or other in the control group. The intervention group was comprised of 41.18 percent NZ European, 41.18 percent Māori, 5.88 percent Asian, 5.88 percent other (not specified) and 5.88 percent not stated. No intervention participants identified as Pacific Islanders.
Table 5-2: Ethnicities of study participants by group

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Intervention</th>
<th>Usual care</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ European, n (%)</td>
<td>7 (41.18)</td>
<td>8 (47.06)</td>
</tr>
<tr>
<td>Maori, n (%)</td>
<td>7 (41.18)</td>
<td>7 (41.18)</td>
</tr>
<tr>
<td>Pacific Island, n (%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Asian, n (%)</td>
<td>1 (5.88)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Other, n (%)</td>
<td>1 (5.88)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Not stated, n (%)</td>
<td>1 (5.88)</td>
<td>2 (11.76)</td>
</tr>
</tbody>
</table>

5.2 Primary endpoints

The data were analysed using the independent samples t-test, and were adjusted for covariates. No statistically significant effect was found between groups although a trend for reduction in mean alcohol intake was found in both the intervention and usual care groups, which was at a higher mean rate in the intervention vis a vis usual care. The dependent variable was the difference in mean number of drinks at time point one and time point two. An ANOVA analysis of the variants showed that the mean number of drinks between time point one and time point two decreased by 66.65 percent and 21.46 percent between the intervention and usual care groups respectively. The covariates included age, gender and the mean baseline level of consumption. Neither age (p = 0.140), nor gender (p = 0.857) were statistically significant to the change in the mean number of drinks per week between time point one and time point two. Baseline drinks consumed per week were statistically significant (p = 0.01) in that the higher the consumption to begin with, the more marked the response was in lowering consumption levels at the second time point. Table 5-3 demonstrates the tests of between subject effects.
Table 5-3: Tests of between subject effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>Degrees of freedom</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>727.37</td>
<td>1</td>
<td>727.37</td>
<td>2.370</td>
<td>0.14</td>
</tr>
<tr>
<td>Gender</td>
<td>10.184</td>
<td>1</td>
<td>10.18</td>
<td>0.033</td>
<td>0.86</td>
</tr>
<tr>
<td>Baseline drinks per week</td>
<td>2406.45</td>
<td>1</td>
<td>2406.45</td>
<td>7.840</td>
<td>0.01*</td>
</tr>
<tr>
<td>Group</td>
<td>170.28</td>
<td>1</td>
<td>170.28</td>
<td>0.555</td>
<td>0.47</td>
</tr>
</tbody>
</table>

*Note. *significant at the 5% level of significance.*

The primary endpoints for this study included the number of drinks consumed per week, and the number of drinks consumed per session. Alcohol consumption was measured via the ACT questionnaire whilst the participant was in the ED, and again within six weeks of their ED attendance regardless of randomisation into the control and intervention groups. Figure 5-2 demonstrates the mean number of drinks consumed at the two time points for the intervention and control groups respectively. When analysed using the independent samples t-test, no statistically significant differences were identified despite the trend for reduction demonstrated below. The intervention group showed a reduction from a mean of 18.8 drinks consumed (with standard deviation of 14.65) at time point one, to a mean of 6.27 drinks consumed (with a standard deviation of 8.32), a mean reduction of 66.65 percent. The usual care group demonstrated a reduction from a mean of 20.18 drinks consumed (with a standard deviation of 14.73) at time point one, to a mean of 15.85 drinks consumed (with a standard deviation of 22.99) at time point two; a mean reduction of 21.46 percent.
The ACT also assessed drinks consumed per session as demonstrated in Figure 5-3. The intervention group demonstrated a reduction from a mean 12.53 (standard deviation 8.42) standard drinks consumed at time point one, to a mean 3.73 (standard deviation 4.84) standard drinks consumed per session at time point two; a mean reduction of 70.23 percent. The usual care group demonstrated a reduction from a mean 14.47 (standard deviation 8.27) standard drinks consumed per session at time point one, to a mean 9.69 (standard deviation 10.64) standard drinks consumed per session at time point two; a mean reduction of 33.03 percent.
5.3 Secondary endpoints

This study’s secondary endpoints include the amount of time invested in follow up phone calls; the types of alcohol being consumed as compared between males and females at time point one and time point two; the knowledge participants had about the recommended maximum alcohol intake per week for males and females; and participants AUDIT scores and what these scores mean.

The researcher, an RN working in the ED at Waikato Hospital, undertook the follow up phone calls. The phone calls were undertaken during different times of the day, ranging from 09.00 to 20.30, and on different days of the week including weekends. The success rate in reaching participants varied greatly, with some participants requiring only one phone call to reach, others requiring up to 30 phone calls, and others, despite over 30 phone calls, still not being reached. The type of drinks consumed varied between males and females as illustrated in the following two figures, which depict time point one and time point two. At time point one wine was
Results

less popular with females (n = 11 percent) than males (n = 13.64 percent), beer was also less popular with females (n = 22 percent) than males (n = 29.55 percent), cider was relatively similar with females (n = 7 percent) and males (n = 9.09 percent), females were more likely to drink RTDs (n = 30 percent) compared to males (n = 25 percent), females were also more likely to consume spirits (n = 22 percent) than males (n = 18.18 percent), and females were again more likely to drink shots (n = 7 percent) than males (n = 4.55 percent).

Figure 5-4: Types of beverages consumed at time point one (Error bar = 1SD)

Time point two differed in actual percent, but the overall trend was the same. Figure 5-5 shows how wine was less popular with females (9 percent) than males (15.38 percent), as was beer for females (27 percent) to males (53.85 percent), both females and males reported 0 percent consumption of cider, RTDs were again more popular with females (36 percent) than males (23.08 percent), spirits were also favoured by females (18 percent) more so than males (7.69 percent) and shots were also consumed more by females (9 percent) than males (0 percent).
Included in the ACT questionnaire was the question “do you know what the recommended maximum alcohol intake a week is for: males? Females?” At time point one, no participants were able to report the correct maximum recommended alcohol intake per week. Participants in the intervention group were sent a literature pack within one week of their ED attendance that contained information about the recommended maximum alcohol intake both per session and per week. However, at time point two, again no participants were able to report the correct alcohol consumption per week.

The participants in the intervention group received a brief intervention over the phone using the AUDIT. The AUDIT is a series of questions developed to explore an individual’s drinking patterns, and assess their risk of developing dangerous drinking behaviours. The AUDIT questions are explained using the following figures:

![Figure 5-5: Types of beverages consumed at time point two (Error bar = 1SD)](image)
Figure 5-6: How often do you have a drink containing alcohol?

The first AUDIT question (figure 5-6) assessed the frequency of alcohol consumption and showed the second highest mean response (2.64), and standard deviation (0.93); where 0 was never, 1 was monthly or less, 2 was 2 to 4 times per month, 3 was 2 to 3 times per week, and 4 was 4+ times a week.
The second AUDIT question (figure 5-7) looked at the amount of alcohol consumed in one sitting, the results demonstrated a mean (2.43), and standard deviation (1.45) conducive with high consumption rates; where 0 was 1-2, 1 was 3-4, 2 was 5-6, 3 was 7-9, and 4 was 10+.

Figure 5-7: How many units do you have on a typical day when you are drinking?
The third AUDIT question (figure 5-8) refers to the number of times an individual has consumed more than the recommended maximum drinks in one sitting and showed a relatively high mean (2.21), and standard deviation (1.05); where 0 was never, 1 was less than monthly, 2 was monthly, 3 was weekly, and 4 was daily or almost daily.
Figure 5-9. How often during the last year have you found that you were unable to stop drinking once you had started

The fourth AUDIT question (figure 5-9) explored drinking patterns and found a mean (0.64), and standard deviation of (1.08) reflecting lower numbers of participants unable to stop drinking once they had started; where 0 was never, 1 was less than monthly, 2 was monthly, 3 was weekly, and 4 was daily or almost daily.
Results

Figure 5-10: How often during the last year have you failed to do what was normally expected from you because of your drinking?

AUDIT question five (figure 5-10) assessed behaviours whilst under the influence of alcohol, exploring how often the individual’s standard of behaviour had been lower than normally expected due to their alcohol consumption. The results showed a low mean ($n = 0.86$), and standard deviation of $(0.86)$. The scores reflect: 0 was never, 1 was less than monthly, 2 was monthly, 3 was weekly and 4 was daily or almost daily.
The sixth AUDIT question (figure 5-11) again assessed behaviours relating to alcohol consumption, the resulting mean (0.21), and standard deviation (0.58) were markedly lower than previous questions due to only two participants having needed an alcoholic drink the morning post a heavy drinking session. The scores were as follows: 0 was never, 1 was less than monthly, 2 was monthly, 3 was weekly, and 4 was daily or almost daily.
AUDIT question seven (figure 5-12) assesses participants reflection on their own drinking behaviours, revealing the following mean (0.79), and standard deviation (0.80); where like question seven, is much lower than previous scorings. The scores were: 0 was never, 1 was less than monthly, 2 was monthly, 3 was weekly, and 4 was daily or almost daily.
The eighth AUDIT question (figure 5-13) asks participants about one of the
detriments from binge drinking to intoxication – memory loss, resulting in an average
mean (1.21), and standard deviation (0.70); where 0 was never, 1 was less than
monthly, 2 was monthly, 3 was weekly, and 4 was daily or almost daily.
The ninth AUDIT question (figure 5-14) assessed participants' rates of injury over the past year, something rife as a harmful result of binge drinking throughout literature and showed the highest mean (3.29) and standard deviation (1.49) of all ten questions. The scores were as follows: where 0 was no, 2 was yes, but not in the last year, and 4 was yes, during the last year.
Question ten (figure 5-15) asks participants about the involvement of family, friends and health professionals about their current drinking behaviours. The resulting mean (1.14) and standard deviation (1.88) were average in comparison to the previous questions. The scores were: 0 was no, 2 was yes, but not in the last year, and 4 was yes, during the last year.
Figure 5-16: Total AUDIT score

The total AUDIT score (figure 5-16) revealed a mean (15.73) and standard deviation (7.09), demonstrating increasing risk, which is reflective of the 10 questions above. The scores were: 0-7 was lower risk, 8-15 was increasing risk and 16-19 was higher risk and 20+ was possible dependence.

5.4 Conclusion

The data were analysed using the independent samples t-test, showing no statistical significance. However a trend for reduction from time point one to time point two in both the intervention and usual care groups respectively, can be seen in figures 5-2 to 5-16. No statistical significance was found between the covariates of age and gender on mean number of drinks consumed at time point one and two respectively. These results will be discussed in more detail in the following text in Chapter VI: Discussion.
Chapter VI: Discussion

_Alcohol ruined me financially and morally, broke my heart and the hearts of too many others_

Craig Ferguson

6.0 Introduction

Alcohol consumed in excess has been widely recognised as a predictor for poor health outcomes, and a key contributor to personal, social, whanau and financial stresses (Afifi et al., 2008; Christoffersen, & Soothill, 2003; Popova, Giesbrecht, Bekmuradov, & Patra, 2009; Rossow, 2000). A global body of research both within the domain of excess alcohol consumption and in other areas of self-determining behaviours such as smoking, lack of exercise and nutrition, has shown that screening and brief intervention is an effective means of both identifying an issue, and prompting the individual to make changes toward a healthier lifestyle (Bien, Miller, & Tonigan, 1993; D’Onofrio et al., 2008; Gmel, Gaume, Bertholet, & Daeppen, 2012; Heather, 2012; Nilsen et al., 2008; Terrell et al., 2008; Wutzke, Conigrave, Saunders, & Hall, 2002). The current study has examined the effect of the use of a targeted literature pack, as well as a telephone delivered brief intervention in reducing the problematic drinking behaviours in young adults presenting to Waikato Hospital’s Emergency Department (ED). The literature review yielded the following research questions about the domains of alcohol, screening and brief interventions:

1. What is the impact of a targeted literature pack and telephone brief intervention in self-reported rates of alcohol consumption in young people attending the Waikato ED?
2. Is a nurse-led intervention an appropriate and efficient use of resources?

This final chapter will explore the findings of the study in line with current evidence in part one. Part two will consider the feasibility of implementing a national screening and brief intervention in New Zealand EDs; and part three will close the report, including the limitations, practice and policy implications, future research and conclusions.
Part I: The impact of offering a brief intervention: the study findings

6.1 Study findings

Screening and brief intervention are an effective means of targeting a said behaviour, and prompting an individual to change their behaviours toward a healthier lifestyle. The current study recruited patients from a level three trauma centre ED, servicing a population of 382,716 people, both urban and rurally situated. The hospital itself is located in a city of 129,249 population, of which the median age is 31.3 (Statistics New Zealand, 2006). Of the known potential participants (n = 102), there was a significantly high refusal rate (n = 68), resulting in the consented participant number being very low (n = 34). Akin to the participants who refused participation in the said research, were a number of potential participants excluded due to differing reasons such as still clinically intoxicated, no fixed abode, no contactable phone, patient sedated, concurrent suicide attempt / overdose / self harm behaviour, and a number of participants who were under the age of 18. Therefore, the consented participants in this study are by no means a fair reflection of the total number of alcohol related attendances to the ED. The high refusal rate, and the number of potential participants who did not meet the inclusion criteria demonstrate that readiness for behavioural and societal moves toward safer drinking levels remain largely resistant to change.

The demographic disposition of the study participants denotes an over-representation of males (n = 23) as compared to females (n = 11) in both the intervention and usual care groups respectively; with males representing 67.65 percent, and females representing 32.35 percent of the total population consented. This correlates with the current body of literature which explains that men are more likely to consume alcohol than women, and are more likely to drink daily or weekly, and drink more heavily and more often than women (Schuckit, 2005). The analysis of the types of alcohol showed a clear gender trend for consumption patterns. Time points one and two demonstrated that both wine and beer were less popular with females than males, both females and males reported similar consumption of cider, Ready To Drink (RTD) were more popular with females than males, spirits were also
favoured by females more so than males, and shots were also consumed more by females. Also noted in the analysis was the reduction in mixing types of alcohol consumed in one sitting post ED attendance; both the intervention and usual care groups showed a reduction in drink mixing.

A study by Jatrana, Carter, McKenzie, & Wilson (2011) identified that New Zealand Māori self-reported more frequent instances of binge drinking than New Zealand Europeans reported, which was not mirrored in the current study. However the numerical difference between the NZ European and Māori was only one participant, therefore the difference may be due in part to the small sample size. The intervention group was comprised of 41.18 percent NZ European, 41.18 percent Māori, 5.88 percent Asian, 5.88 percent other (not specified) and 5.88 percent not stated. No intervention participants identified as Pacific Islanders. The usual care group included participants who identified as NZ European (47.06 percent), Māori (41.18 percent), and 2.00 percent who did not identify their ethnicity. No participants identified as Pacific Islanders, Asian or other in the usual care group. Therefore, of the total consented population the majority were NZ European (44.12 percent), and Māori (41.18 percent), with a small group not stating (8.82 percent), and both Asian (2.94 percent) and other (2.94 percent) ethnic groups representing the remaining population. Without the ethnical disposition of the known total eligible population (n = 102) and the remaining population that may have not been accounted for, it is unfair to stipulate results relating to ethnicity. However, what is clear is that the majority of participants identified as NZ European and Māori. Literature supporting ethnical patterns and alcohol consumption has generally been conducted within a certain demographical environment such as Korea (Chou et al., 2012), or United States (Terrell et al., 2008), but a study with a bigger sample size set in New Zealand may also shed light on the demographic contributors within our country.

6.1.1 **What is the impact of a targeted literature pack and telephone brief intervention in self-reported alcohol consumption rates in young people attending the Waikato ED?**

The use of a targeted literature pack and telephone brief intervention was found to be effective in reducing the self-reported alcohol consumption rate in young people
attending the Waikato ED in comparison to a usual care group; thus illustrating a treatment effect, although no statistical significance was found. Countless research pieces have examined the use of screening and brief intervention in healthcare targeting alcohol consumption behaviours, finding that a number of methods have demonstrated time efficacy as well as a successful decrease in problem drinking (Bien, Miller, & Tonigan, 1993; D’Onofrio et al., 2008; Gmel, Gaume, Bertholet, & Daeppen, 2012; Heather, 2012; Nilsen et al., 2008; Terrell et al., 2008; Wutzke, Conigrave, Saunders, & Hall, 2002). This may in part be due to the increased receptivity of patients institutionalised as a result of their drinking (Nilsen et al., 2008). The ‘teachable moment’ that Nilsen et al. (2008) conceptualise is demonstrated in the current study. Nilsen et al. (2008) explain the notion that patients that need to seek health care services due to an injury or illness caused by their drinking behaviours come to a realisation that they can implement changes in their own conduct to minimise health risks. Both the intervention group and the usual care groups demonstrated a trend for reduction in both per week and per session consumption between time points one and two. Arguably, the reduction per week in the intervention group by 66.65 percent and per session of 70.23 percent, was due to the brief intervention offered, but has also been partly due to the aforementioned teachable moment (Nilsen et al., 2008) whereby a reduction is seen in the number of drinks consumed in relation to the ED admission and not due to the intervention. The usual care group however, received normal ED treatment, thus no intervention, and yet showed a reduction of 21.46 percent in their alcohol consumption per week, and 33.03 percent per session between time points one and two. This again illustrates the increased receptivity that patients have toward behavioural change, simply from their admission to the ED following an alcohol related illness or injury. These results indicate that the study implemented showed a trend for reduction. The feasibility of implementing the said research will be discussed in section 6.2.

6.1.2 Is a nurse-led intervention an appropriate and efficient use of resources?

The current study found that the nurse delivered telephone component of the brief intervention was effective, although encountered some major resource management challenges. Firstly, the majority of participants were reached within one to two
phone calls, however a number of participants took up to and in excess of thirty phone calls to reach, with 26.47 percent of participants not being followed up at study completion. The researcher undertook all phone calls to participants to deliver the brief intervention. These phone calls took place between the hours of 09.00 and 20.30, both during the week and on the weekend dependent upon the researchers shift rota. Over the three months, the researcher spent in excess of 100 hours calling study participants, with some participants requiring over 30 phone calls to be contacted to deliver the brief intervention. Thus from a cost analysis vantage point, the question must be raised whether the delivery of the phone calls and subsequent brief intervention does in fact require a nursing qualification? Literature depicts that most health professionals feel that they have not been given adequate training to deliver a brief intervention, however the researcher undertook no formal training in order to deliver the brief intervention and undertook the role within current full time employment within ED. This may infer that if the tool to deliver a brief intervention is set up effectively, a multidisciplinary team (MDT) approach to delivery of care can be initiated and maintained. The MDT approach could include nurses, doctors, physiotherapists, occupational therapist, social workers, and allied health staff such as healthcare assistants. Thus the potential to reach more of the ‘at harm’ population is dramatically increased. As the future of the nursing workforce and delivery expectations evolve, so too must the skill distribution and management thereof.

The use of a nurse led initiative was shown in this study to be effective, however a greater number of patients could be screened and offered a brief intervention if all staff involved in patient contact were engaged in such a programme. This is discussed further in Part two: The feasibility of implementing a brief intervention in the Emergency Department. A number of other communication mediums have been explored in other studies to reduce the human resource demand of delivering a brief intervention such as text messaging (Baird, Ranney, & Mello, 2012), and computer based systems (Blankers, Koeter, & Schippers, 2011; Murphy, Bijur, Rosenbloom, Berstein, & Gallagher, 2013). These studies resource utilisation in terms of nursing hours far surpassed the current study where an excess of 100 hours over three months still failed to follow up 26.47 percent of participants. Thus the conclusion drawn from the study is that the intervention delivered over the phone by
a registered nurse was in itself effective, however was not a time efficacious resource utilization in terms of the appropriate distribution of nursing hours. Considering the skill mix that allied health professionals bring to the patient care interface, the conclusion is that a nursing qualification is not imperative to providing a screening and brief intervention for alcohol, the responsibility falls on every health professional involved in patient care.
Part II: The feasibility of implementing a brief intervention in the Emergency Department

6.2 A new way of thinking

The current health system is constrained by costing and analysis of appropriateness of human resourcing. Thus, the lower the cost to implement a new system such as screening and brief intervention the more likely it is to be adopted and implemented into routine practise. The resources utilised in the current study were a targeted literature pack, the Alcohol Use Disorder Identification Tool (AUDIT), a telephone line and nursing hours. In terms of costing, the New Zealand Alcohol Advisory Council (ALAC) supplied the literature pack as a free resource, and the AUDIT tool was downloaded via the Internet. Thus, the implementation of a screening and brief intervention in the ED would involve the following costing; printing for the AUDIT, and postage for the literature pack to participants. As outlined above, the use of nursing time to follow up with patients over the phone was not an efficient means of utilising resources, but the initiation of a text message, internet based system, or APP on smart device technology may be more resource efficient and may be a direction for future research to explore.

In an environment as fast paced and demanding as the ED, new initiatives to meet District Health Board (DHB) and Ministry of Health (MoH) targets must be feasible in terms of implementation. With a staff base of over 120 nurses (Waikato ED), the implementation of a new initiative needs to be streamlined so as not to burden the staff base with a task so complicated that it simply wont happen due to time constraints. For example, an initiative that requires the department to send nursing staff off on formal education days to learn how to implement the tool will take significantly longer to have all staff educated and capable of delivering the said tool than if it can be delivered in an in service education session. As previously discussed, the implementation of a screening and brief intervention does not require a nursing qualification specifically, thus with a multi disciplinary approach, the feasibility of implementing the initiative increases.
The implementation of a telephone-based service has been discussed as having encountered major resource demand issues. However, numerous other service deliveries have been explored in other studies to reduce the human resource demand such as text messaging (Baird, Ranney, & Mello, 2012), and computer based systems (Blankers, Koeter, & Schippers, 2011; Murphy, Bijur, Rosenbloom, Berstein, & Gallagher, 2013). In order to evolve with the target audience, the service delivery must be appropriate to reach out to this subset of society. The development of an APP that patients can use whilst waiting in the ED may prove to be a time effective means of communication. Therefore, other options of service delivery must be explored such as text message systems, online interactive sessions, or the development of an APP available on smart device technology. The trend for reduction that was observed in the current study demonstrates that there is a subset of society wanting to change their consumption patterns and beliefs. Therefore the development of a user-friendly service must be a priority if the initiative is to be successful.
6.3 Study limitations

Every methodology is fraught with limitations (Moule & Goodman, 2009). Randomised controlled trials can be effected by both internal and external limitations. Researchers must implement measures to ensure both internal and external validity. Internal validity is a pre-requisite for external validity in that if internal validity is not maintained, there will be no validity for results outside of the research environment (i.e. external validity). Internal validity is the means in which the researcher has endeavoured to reduce researcher bias, and produce or test, factual scientific knowledge. The factors of internal validity include: bias, randomisation, concealment allocation, baseline comparisons, blinding and intention to treat. Internal limitations include both type one and type two errors. Type one errors are considered more serious than type two errors, and occur when the findings of the study prompt the researcher to reject the null hypothesis incorrectly. Type two errors occur when the researcher fails to reject the null hypothesis when it should have been rejected based on study findings.

6.3.1 Bias

Bias is the overarching concept in which a researcher may fail to objectively collect and study the data, resulting in a false positive or false negative treatment effect. Bias encompasses randomisation, concealment allocation, baseline comparison, blinding and intention to treat. In order to reduce selection bias in the current study, randomisation to the intervention or usual care groups was employed. Participants had equal chance of being randomised to either treatment arm.

6.3.2 Concealment allocation

Concealment allocation is where the researcher implementing the study is blinded to the allocation and was achieved by an impartial third party creating the envelopes containing the randomisation assignment to be opened after the completion of the ACT in the ED. Thus the researcher was not aware of the contents of the envelope.
regarding randomisation, and as such could not assign participants to either treatment arm intentionally.

6.3.3 Baseline assessment
Baseline assessment gathered data used to analyse the difference between time points one (baseline) and two; but also to gather demographic data used to inform secondary endpoints. Baseline assessment was undertaken using the ACT whilst in the ED prior to randomisation. All participants undertook a uniformed baseline assessment, thus there was no treatment difference between the intervention and usual care groups at baseline.

6.3.4 Blinding
Blinding is defined as concealing the treatment arm allocation from as many individuals involved in the research as practically achievable. Blinding was achieved by the ACT being completed in the ED prior to randomisation, thus neither the participants nor the researcher were aware of assignment into which treatment arm, decreasing researcher bias. Participants were also not informed of whether they were in the intervention or usual care group, they were simply told the number of phone calls they would receive within the next six weeks. Thus aiming to reduce participant bias in reporting of consumption rates.

6.3.5 Intention to treat
Intention to treat is defined as analysis of all participants in the group they were initially assigned to. Intention to treat was upheld in the current study by random assignment being upheld, and no participant nor the researcher being able to choose assignment group.

Internal limitations also include both type one and type two errors. Type one errors are considered more serious than type two errors, and occur when the findings of the study prompt the researcher to reject the null hypothesis incorrectly; and type two errors occur when the researcher fails to reject the null hypothesis when it should have been rejected, based on study findings. The current study has accepted the null hypothesis as true, due to the lack of statistical support shown in the results for the
hypothesis, despite a trend for reduction being observed. The null hypothesis was that the brief intervention would not result in a self-reported reduction in alcohol consumption between time points one and two.

The external limitations of the current study included the Hawthorne effect, the drop out rate, the environment the study was conducted in, and participant characteristics.

### 6.3.6 Hawthorne effect

The Hawthorne effect is the notion that study participants change their behaviour because they are being studied. This may have affected the current study because participants were aware that they would be called within six weeks to re take the ACT.

### 6.3.7 Drop-out

In this study, one participant pulled out after receiving the brief intervention, and three participants were lost to follow up from the intervention group. From the usual care group, six participants were lost to follow up. The drop out rate was expected due to the lack of aptitude for patience the younger generation display (Bernstein et al., 2010).

### 6.3.8 Study environment

The current study was undertaken in a very unique environment, the ED. The ED is not the real world setting in terms of “opportunity structure” (Bernstein et al., 2010, p 900) for problem drinking. As the ED is not the social drinking environment, although some participants showed a readiness to change behavioural drinking patterns, when in the environment for social drinking, participants may still exhibit unhealthy drinking patterns and behaviours.

### 6.3.9 Participant characteristics

Participant demographics showed a higher number of males than females, and an ethnical split between NZ European, NZ Māori, Asian and not stated / other. The participants were over 18 years of age, and the study was aimed at participants who were acutely ill or injured, thus the brief intervention was aimed at participants who
engaged in risky binge drinking behaviours, but who were not chronic alcoholics. Therefore the results of this study may not be appropriate to offer to participants who demonstrate alcohol dependence.

6.3.10 Sample size
The current study was based on a power test informing a sample size of no less than 26 participants per treatment arm. However, a smaller than anticipated sample size was obtained, totalling 34 participants. Thus with a small sample size, larger confidence intervals and margin of error must be anticipated.

6.4 Implications on social policy, economics and health of the binge drinking population
The inevitable weekend burden of drunken patients is something now considered normal in New Zealand EDs. The current study has outlined the interminable detriments of the binge drinking culture at a personal and societal level. Binge drinking is a causal factor in up to 60 illnesses (World Health Organization, 2007), increases injury related ED attendances (Charalambous, 2002; Lee & Forsythe, 2011; Rossow, 2000), impacts on education (New Zealand Qualifications Authority, 2014), affects employment, health expenditure, and every facet of day-to-day functioning. So whose responsibility is the education and regulation of consumption to reduce the harms from alcohol in a society so resistant to change? The answer is a multifaceted approach, whereby the Trans Theoretical Model of change (TTM) is capitalised upon in health, education, sport and governmental drives for policy change. When the message is disseminated through a number of different mediums, it becomes more widely acknowledged and accepted. Although the ED is a unique environment and cannot therefore be expected to change the societal norm that has become problem drinking, or the “opportunity structure” (Bernstein et al, 2010, pg. 900) that influences binge drinking, the role of the ED within this model is key. As previously cited, the ED forms the front door for the hospital, and also sees a significant number of alcohol related illness and injury presentations. Therefore the ED has the unique advantage of seeing patients when they are most likely to want to initiate change toward healthier drinking patterns. The ED can capitalise on this
opportunity by offering alcohol screening and brief intervention. EDs nationwide need to formalise the screening and brief intervention practises that some health practitioners embrace in their practise, to be a uniform pathway that explicitly dictates outcomes measures. In this model, doctors, nurses, physiotherapists, occupational therapists, social workers and every health professional that has patient contact has the opportunity to initiate screening and brief intervention. Thus engaging all staff involved in the staff to patient interface, the implementation of a brief intervention has the potential to significantly impact the health and wellbeing of the community. This model may see the AUDIT used as intended as an identifying tool rather than a brief intervention, and the AUDIT may dictate whether a patient is then sent a literature pack post their ED discharge, or referred to more intensive rehabilitation services. The use of the AUDIT as an identifier still capitalises on the TTM and may prompt the individual to initiate change based on receiving the questions alone. One New Zealand ED has made a move toward portraying the message that binge drinking is not acceptable by staff wearing a t-shirt sporting the ‘ease up on the drink’ catch phrase from the New Zealand Alcohol Advisory Council (ALAC) campaign on weekend shifts.

The implications for practice for health professionals may include a social backlash, increased workload, and some staff having to look at their own consumption rates too. Thus a certain amount of resistance must be anticipated. However, health professionals working in over loaded departments with preventable attendances would optimistically be interested in initiating policy change to increase departmental safety and health outcomes for patients. The enrolment rate for the current study was less than half the anticipated number, and also took significantly longer to enrol these participants, thus supporting the notion that an initial social backlash and must be anticipated; or that the delivery of the screening and brief intervention was not appropriate for the target audience. Therefore, other options of service delivery must be explored such as text message systems, online interactive sessions, or the development of an APP available on smart device technology. The trend for reduction that was observed demonstrates that there is a subset of society wanting to change their consumption patterns and beliefs. Therefore the development of a user-friendly service must be a priority.
Alcohol use and abuse is a significant issue in New Zealand, and with the cost associated with the binge drinking culture rapidly increasing, a policy drive to make alcohol less accessible needs to be implemented. International policy drives to decrease alcohol related harms include increasing the minimal legal purchase and consumption age, increasing alcohol tax, limiting opening hours for liquor distributors, and reducing outlet density. These policy drives have shown an effective decrease in the sale of alcohol, and a corresponding reduction in alcohol use and abuse and the effects thereof (Gruenewald, 2011). New Zealand has made some significant changes in the recent decade to reduce alcohol related harms such as decreasing the legal driving limit for under 20 year olds to a no alcohol tolerance (Ministry of Transport, 2011). However the cost of alcohol related harms now far surpasses the actions initiated thus far, and thus a review of the legal purchasing and consumption age needs review, as do health services approach to alcohol related presentations, and as does the culture of sport and excess alcohol consumption. A shift from idolising intoxication needs to be made to focusing on safer drinking levels and behaviours; and this needs to be supported from governmental level, down through the institutions of health, education, business and sport. The support that the New Zealand sporting scene receives could be used to highlight the dangers of excess consumption. If the sporting scene were to get behind a policy drive to reduce excess consumption, it would reach a subset of the New Zealand society that is largely resistant to change. The College of Emergency Nurses New Zealand (CENNZ) highlight numerous key factors in their submission to the Justice and Electoral Select Committee in 2011. This report was commissioned when the alcohol law reform bill was being considered and includes suggestions pertaining to increasing the cost of alcohol, removing alcohol sales from supermarkets and superettes/dairies, a BAC limit of zero for all drivers regardless of age, amending the collection of blood sampling in EDs to make the process more accessible, a complete embargo on advertising or sponsorship by alcohol especially within the sporting arena, increasing the penalty for supply of alcohol to minors, and a better resource allocation to intervention strategies for not only alcohol related attendees but for their families too (Bichan, 2011). The current study has demonstrated the need for more drastic measures to be implemented to reign in the current alcohol
damage, and to prevent the next generation from following down this path of
destruction. The submission by Bichan (2011) highlights numerous key policy drives
that would effectively reduce the harms of problem drinking.

The implications that the trend for reduction has on economics in terms of health
expenditure are promising. The current study has demonstrated that there are
members of society recognising that their behaviour impacts their lives negatively,
and are eager to initiate behavioural changes in order to reduce alcohol consumption.
These behavioural changes need to be supported in order to reduce the global
expenditure associated with binge drinking. A study based in America demonstrated
that a lower minimum drinking age increased high school drop out rates, increased
binge drinking episodes, increased teenage pregnancy, and increased negative birth
outcomes such as low Apgar scores, low birth weight and premature births (Zhang &
Caine, 2011). In order to reduce the costs associated with binge drinking such as
those highlighted, and the ever-increasing disease burden associated with alcohol
consumption, the culture of acceptance, normalisation and idolisation of intoxication
needs to be abolished.

6.5 Future research

6.5.1 The relationship between a brief intervention and the health sector

The relationship between alcohol and the health sector is one that has long been
researched. Alcohol has been found to contribute significantly to up to 60 diseases
(World Health Organization, 2007), increase the injury related attendance burden and
decrease quantity and quality of life for those participating regularly in binge drinking
(Charalambous, 2002; Lee & Forsythe, 2011; Rossow, 2000). The New Zealand
expenditure on alcohol related illness and injury currently exceeds NZ$4.9 billion,
and previous estimates have stretched as high as NZ$16.1 billion (Law Commission,
2009, p168). Thus the New Zealand economy is haemorrhaging money into the
consequences of the alcohol culture instead of focusing on prevention.

A study by Bernstein et al. (2010) found that offering a brief intervention in the ED
setting resulted in participants making substantial efforts to alter drinking behaviours,
however did not change the actual consumption rates between groups. This is an important factor to consider in offering a brief intervention in terms of follow up, the ED is a unique environment and does not change the “opportunity structure” (Bernstein et al., 2010, p 900) nor the societal norm that has become problem drinking, but is nonetheless an important link in the chain to stopping the current burden of problem drinking. Due to time constraints, participants were followed up at two weeks post ED attendance only. This could direct future research in maintaining follow ups for a year post attendance, including supporting the attempted behavioural change by reinforcing with another follow up at three, six and 12 months post ED attendance in line with current literature (D’Onofrio et al., 2008; Freyer-Adam, 2007; Mello et al., 2005; Heather, 2012). The follow-ups may include referring to the literature pack to increase awareness about maximum consumption rates and measures to initiate behavioural change.

6.4 Conclusions

The significant burden of excess alcohol consumption is a concerning trend worldwide. New Zealand has developed a culture that idolises the effects of binge drinking such as intoxication. The health risks associated with binge drinking are vast and include an increased likelihood of developing numerous conditions including cancer, heart disease, diabetes, stroke and injury (Brust, 2005; Lohr, 2005; Rehm, Samokhvalov, & Shield, 2013; Vonghia et al., 2008). The responsibility for reducing the risks associated with the binge drinking culture fall in part on the health sector, and as such EDs nation wide need to capitalise on the opportunity to implement a uniform screening and brief intervention tool aimed at reducing problem drinking behaviours. The current study has shown that screening and brief intervention are indeed an appropriate use of resources, and depict that a significant behavioural change can be initiated post ED attendance, and capitalised upon with a brief intervention. The brief intervention delivered in ED setting, will reduce excess alcohol consumption and initiate societal change toward healthier drinking behaviours, beliefs and patterns. Behavioural modification and societal change take time, energy and appropriate resource management, but are vital to the future health and wellbeing of today’s society. Binge drinking is not healthy, it is not sustainable, and it should not be the future of New Zealand; and EDs have the unique
opportunity to significantly impact alcohol consumption trends by offering a screening and brief intervention that is user friendly and efficient.
Appendices

Chapter VII: Appendices

Appendix I: Research proposal
Appendix II: Ethical approval
Appendix III: Patient information sheet and consent form
Appendix IV: ACT
Appendix V: Targeted literature pack
Appendix VI: AUDIT
Appendix VII: AUDIT response advice
Appendix VIII: Statistical analysis
Appendix I: Research proposal

Title
Alcohol related presentations to the Emergency Department: A feasibility randomised controlled trial to investigate the impact of a brief intervention for adults to encourage changes in behavioural drinking beliefs and patterns.

Introduction
Harmful drinking is a problem of pandemic proportion worldwide (Charalambous, 2002; Lee, & Forsythe, 2011). Exposure to this environment leads to intricate, multifaceted patterns of family dysfunction and social disruption (Afifi et al., 2008; Christoffersen, & Soothill, 2003; Popova, Giesbrecht, Bekmuradov, & Patra, 2009; Rossow, 2000). Harmful drinking pre-empts numerous social issues including financial stress, loss of family and friends, violence and aggression, injury to self/others, disease progression, child abuse and neglect, attempted and completed suicide, drink driving and consequently injury/death (Rossow, 2000). Harmful drinking is one of the causal factors for an increasing number of ED attendances and hospital admissions annually (Charalambous, 2002; Lee, & Forsythe, 2011). The New Zealand Alcohol Advisory guidelines define harmful drinking as five or more units of alcohol for males, and four or more units of alcohol for females in a single drinking session (ALAC, 2013). This drinking to excess affects personal and social functioning which in turn strains resources at all societal levels.

Problem drinking as defined by the ALAC has a ripple effect with the initial personal burden fast spiralling to increased demand on emergency services, overcrowding of EDs and increasing resource demand at departmental and hospital levels. A literature review conducted by Taylor et al. (2010) revealed the following impacts of harmful alcohol consumption: an increase in suicidal ideation, the increased likelihood of attempting suicide with long term alcohol abuse, and similarly the increased likelihood of a family member/spouse attempting suicide related to the said alcohol consumption. The statistics for alcohol related suicide attempts differed from the general population in that suicide rates were two to three times higher in males of the general population; however, in the hazardous drinking population suicide rates were relatively equal between males and females. ED attendances related to attempted suicides are on the rise, especially in young girls between the ages of 14 to 20 who are clinically intoxicated (Rossow, 2000). Attempted or completed
suicide may be grouped in the overarching umbrella of violence and aggression which also statistically increase with problem drinking.

The review revealed that in individuals who had the tendency to be aggressive or violent whilst sober, alcohol abuse not only amplified this aggression but also disinhibited the individual to the point of being verbally, physically and sexually aggressive. This put innocent family members such as partners and children at risk of verbal, physical and sexual assault and battery and also put the intoxicated person at risk of becoming the victim of aggression and / or violence. Conflicting reports on the risk of child abuse and neglect were noted (some correlations found but further empirical evidence needed to support). Reportedly, rates of child abuse, neglect and partner abuse rose in accordance with both the length and severity of alcohol use; family violence was reported to be higher amongst lower socio-economic alcohol users (Rossow, 2000). ED sees a growing number of assault related injuries, family violence and intoxicated, hurt individuals being brought in by the police, especially at the weekends (Taylor et al., 2010). This places strain on a department already under pressure and puts the health and safety of other patients and staff at risk. Children were also found to be at greater risk of developing hyperactivity disorders as well as emotional and behavioural problems. Subsequent to the alcohol exposure these children were also at higher risk of going on to develop their own alcohol dependence issues later in life. These issues have been linked to a number of coexisting alcohol related social concerns.

Social issues of note included the rise of homicide rates, falls, disease progression and motor vehicle accidents as the rate of harmful drinking increased. In 2011, driving under the influence of alcohol and / or drugs played a significant part in 77 fatal road crashes, 360 crashes resulting in serious injuries and 970 crashes resulting in minor injuries. A total of $685 million was spent on the aforementioned incidents; which was 22 percent of the ‘social cost’ (Ministry of Transport, 2012) associated with all crashes resulting in injury. Injury, falls and disease management are common causes of repeat attendance to the ED, a recurring trend with alcohol related illness and injury. These long term effects also coincide with the concerning New Zealand binge drinking culture which sees younger ED attendees with repeat attendances for alcohol related injuries.

New Zealand has a binge drinking culture which sees the focal point of social gatherings as alcohol, and the way in which to have fun is to become intoxicated (Balodis, Potenza, & Olmstead, 2009). Young adults, specifically 18 to 25 year olds are particularly likely to be drinking excessive amounts of alcohol and binge drinking to the point of intoxication.
Appendices

(Hingson, Heeren, Edwards, & Saitz, 2012; Imlach Gunasekara et al., 2011). Binge drinking is defined as consuming more than the recommended five units for males and four units for females in a single drinking session (ALAC, 2013). Universities are only one example of a social setting in which binge drinking is encouraged by peers and has become the social norm; students in tertiary accommodation (university halls) are more likely to drink to excess compared to their peers in flats and home environments. It is this excessive drinking that increases the risk of injury and illness, and subsequently ED alcohol related attendances (Imlach Gunasekara et al., 2011). The binge drinking culture of young adults places an exorbitant strain on the emergency services as well as departmental and hospital levels. Physical and mental illness and injury as a direct result of alcohol ingestion contribute to a growing number of ED presentations every year; and young adult attendances are ever increasing (Balodis, Potenza, & Olmstead, 2009). Increasingly longer waits are experienced on the weekends due to alcohol related attendances; as well as the need for extra resource utilisation such as hospital security. Long term harmful drinking leads to a number of chronic health conditions, ranging from hypertension and cardiac disease to gastric and pancreatic disease and cancers. As well as long term complications, the acute intoxication phase can leave people vulnerable to physical injury which is what increases emergency attendances on weekends; fractures, lacerations, assaults, and decreased level of consciousness due to excess alcohol are all common presentations (Forsythe, & Lee, 2012). These acute injuries, as well as long term complications see an ever increasing number of alcohol related ED presentations and hospital admissions (Forsythe, & Lee, 2012); and yet no formal brief intervention is being offered in the ED setting.

Research shows that correlations have been found between the introduction of a brief intervention tool and reductions in self-harm behaviours such as smoking and excessive alcohol drinking (D’Onofrio et al., 2008). Brief intervention ranges from motivational interviewing to interactive sessions, aimed at raising awareness of a problem, offering targeted reduction advice and support, as well as an action plan to reduce the stated problem; and are an efficacious health promotion strategy that target practises to reduce injury and disease progression; thus increasing public health awareness and actively working to reduce harmful behaviours (D’Onofrio et al., 2008). The need for brief intervention services is now far surpassing the need for more intensive rehabilitation services due to the lack of human resources to maintain these programmes.

Albeit dated, Bien, Miller, and Tonigan’s (1993) article found that brief intervention was up to 78 percent more successful in reducing problem drinking than referral to alcohol
rehabilitation services. Brief intervention was shown to be a more successful strategy than referral to an alcohol rehabilitation service (Bien et al., 1993). In the case of young adults, brief intervention is used as a prevention strategy in order to prevent the development of chronic harmful drinking patterns. Heather (2012) argues that the public health benefits for using a brief intervention strategy are immense in that the key is early intervention before the development of chronic harmful drinking patterns become entrenched in the person's social identity. This not only reduces the person's risk of alcohol related disease progression and injury, but prevents the need for intensive addiction intervention in the future. It is also noted that even if the person chooses not to act on the information they have been given about a healthier lifestyle, it prompts deeper thought by the individual about their lifestyle and health (Heather, 2012). Hence, the person may not reduce drinking immediately but over time may re-evaluate their drinking patterns and initiate changes toward drinking at a safer level. Offering a brief intervention in an ED setting is logical because of the number of patients the ED processes annually.

Quantitative trends illustrate that the ED environment was perfect for administering a brief intervention about alcohol. EDs worldwide form the main access point for all illness and injury needing secondary care; consequently ED acts as the front door to the rest of the hospital. Arguably, this would make the ED an ideal environment for opportunistic alcohol screening and brief intervention. Notwithstanding, primary care is the optimal environment for alcohol screening and brief intervention due to the existing rapport between healthcare professional and patient, a more relaxed consultation, and because the focus can be directed more toward preventative care and health promotion (McCormick et al., 2006). However, due to the personal expense of a general practitioner consultation, the ED remains the main access point for majority of intoxicated patients accessing care; and thus has the potential to become the ideal environment for health promotion and alcohol screening. One study's findings describe the phenomenon of the “teachable moment” (Nilsen et al., 2008, p 185) whereby the patient comes to the realisation that alcohol was a direct contributing factor in their injury and they considered the need for changes to their drinking patterns (Nilsen et al., 2008). Similarly, D’Onofrio et al. (2008) found that as long as direct information was given regarding the role alcohol played in the patient's ED visit, the patient cut down on harmful drinking. It was argued that it did not matter whether this came in the form of a brief intervention or scripted
discharge instructions, as long as there was specific mention of problem drinking and strategies given to help to reduce this, both study groups (control and manipulation) showed a reduction in problem drinking (D’Onofrio et al., 2008). Literature utilising a qualitative methodology revealed that healthcare professionals were not asking patients about alcohol consumption as part of routine health screening for numerous reasons including feeling that it would damage the therapeutic relationship, embarrassment, feeling ill equipped to undertake screening and give advice, and general avoidance of the patient (when they were intoxicated) (Imlach Gunasekara et al., 2011; Lock, Kaner, Lamont, & Bond, 2002; McCormick et al., 2006). A trend identified throughout the qualitative literature was that healthcare professionals avoided the subject of alcohol altogether, much less gave any structured advice on reducing harmful drinking. One study’s findings describe audiotaped visits where the health practitioner is audibly awkward when alcohol is mentioned by the patient as being a problem, the health practitioner is stuttering, and trying to divert or finish the conversation rather than exploring the patients’ disclosure (McCormick et al., 2006). Findings of qualitative literature also identified that healthcare professionals were more likely to avoid an intoxicated patient, an increase in intoxicated patients meant longer wait times overall, and that intoxicated patients in the ED compromised staff and patient safety (Imlach Gunasekara et al., 2011). Although the above literature outlines why practitioners were or were not offering brief intervention about alcohol, there was no literature to highlight a nurse driven programme. Thus, despite the ever growing number of alcohol presentations and increased resource demand on the ED, there is no formal screening / intervention that is routinely employed within the ED environment (Forsythe, & Lee, 2012). Given the significance of ED in potentially addressing this issue, this research will seek to explore the impact of a nurse delivered telephone based brief intervention with accompanying targeted literature around the impact of excessive alcohol consumption have on alcohol use amongst 18-25yr olds attending the Waikato ED.

The research hypothesises that implementing an alcohol screening and brief intervention tool in the Waikato ED would see a self-reported reduction in harmful drinking in participants aged 18-25 years. This research will add valuable knowledge to the New Zealand body of literature, which is at this stage very limited. The
research will identify if an intervention is beneficial to young New Zealanders attending the ED with alcohol related illness and injury and will test the efficacy of a nurse-led telephone based intervention.

Methods

Research aims and questions
This research aims to implement a brief intervention targeted at young adults and alcohol encompassing specific alcohol related education in the form of targeted literature. More specifically, it seeks to address the following questions:

1. What is the impact of a targeted literature pack and telephone brief intervention effective in reducing self-reported alcohol consumption in young people attending the Waikato ED in comparison to a usual care group?

2. Is a nurse-led intervention an appropriate and efficient use of resources?

Literature search
A search of the databases Medline, CINAHL, Pubmed, and Google Scholar revealed 327 articles using the following search terms/keywords: alcohol, alcohol drinking, alcohol*, alcoholic intoxication, binge, binge drink*, binge drinking, drink*, excessive, excessive alcohol, interview*, interviews as topic, intox*, telephone, telephone interview*, delivered, led, nurse, nurse delivered, nurse led, nurs*. Key themes identified throughout the literature included the debate over whether the emergency department is a suitable environment to undertake screening and brief intervention; why screening and brief intervention is not happening from the healthcare professionals’ perspectives; and the concept of brief intervention, what it is and what its role is in health promotion? The literature was predominantly of quantitative methodology, utilising the randomised controlled trial as the quantitative research method.

Research design
In order to answer the research question proposed a quantitative methodology will be employed. In particular, a randomised control trial (RCT) will be undertaken. An RCT is an experimental design; thus must include the three components of randomisation, control and manipulation (Maule & Goodman, 2009). The three components reduce researcher bias by reducing variables. Participants are randomised into the control group, whereby no
treatment or placebo is administered, and the manipulation group in which the new treatment is administered.

Figure 1. Research design
Participants

Eligibility criteria include all patients who present to the Waikato ED with an alcohol related injury or illness who is over 18 years old. This study is not gender discriminatory, nor does it exclude potential participants due to mental or physical health conditions. However, participants will be excluded if they are physically or mentally incapacitated and thus are not able to give consent. A power test will be used to inform sample size. Participants will be randomised into the control group – who receive normal care, and the treatment group – who receive the brief intervention and targeted literature pack. More specifically, the intervention group (once consent has been gained) will be given a literature pack made up by the New Zealand ALAC aimed at education around safe drinking, they will be informed that a phone call will be made to them within one week of attending the ED, and another phone call will be made at one month post ED attendance. The phone call at both one week and one month will be a questionnaire to ascertain current drinking practices, thoughts surrounding alcohol use and the effects of alcohol. The use of both a week and one month follow up phone call will capture data that will be statistically analysed using the two sample t-test (explained in more detail in subsection data analysis) to ascertain whether there has been a reduction in harmful drinking practices. The control group will receive normal care, this means they will not have any care withheld for study purposes, but that they will not receive the targeted literature or follow up phone calls (after completion of the study, control participants will be offered brief intervention too).

Data collection

Potential participants will be approached whilst in the ED and informed about the research project. Informed consent will be gained in the form of written consent. Participants will be given a targeted literature pack (made up by the ALAC specifically for brief interventions) and will be informed of the follow up phone calls; one within seven days of their ED visit, and one a month post ED visit. The first of the two phone calls is a nurse-led structured questionnaire in which participants will answer a short survey about their perceptions about alcohol and its role in illness and injury; their alcohol consumption; their perception/knowledge about the recommended safe levels of alcohol intake; and their perception/knowledge of where to get help about harmful alcohol consumption. The second of the two phone calls will repeat the questions from the first phone call to ascertain current alcohol consumption and thought processes surrounding alcohol consumption. The data collection phase of the research will be over six months.
Data analysis

Data will be analysed using the two sample t-test. This is a parametric test which is used to analyse continuous data to ascertain the correlation between the means of two populations; and is used to statistically test the hypothesis. The t-value can be used to ascertain the p-value; and whether or not the p-value reaches the threshold of statistical significance and as such prove or disprove the hypothesis. This statistical analysis should produce rigorous, reliable and valid results. Using the quantitative approach will answer the research question because the question seeks to ascertain if problem drinking is reduced one month after receiving the brief intervention and targeted literature pack. The question asks for numerical data to prove that a reduction has or has not occurred; thus the statistical two sample t-test will show the differences between the means of the control and treatment groups at baseline and one month on from brief intervention.

Limitations

Although a power test will be used to inform sample size, the researcher’s rota will ultimately determine the number of participants included in the research. For example, majority of young patients presenting to the Waikato ED do so between the hours of midnight to seven am on Thursday through to Saturday evenings; thus if the researcher is not working these shifts during the data collection phase, the actual number of participants may fall short of the proposed sample size determined by the power test. In order to minimise this limitation; the researcher plans to approach medical and nursing staff to see if they will aid in the data collection phase and offer brief intervention as part of routine practise. This would involve them explaining that research into alcohol in the ED was being undertaken and partaking in research involved a follow up phone call, presenting the patient with the consent form to participate in the research, and giving the pre-made targeted literature pack to the potential participant.

The expected results and significance of the work

Once the data collection and analysis phases are finished, a write up will highlight the research process and the outcomes of the study. Expected research outcomes are that a reduction in problem drinking will be seen at a personal level with study participants. It is acknowledged that the research timeframe does not lend itself to
producing results that show a population level reduction in problem drinking, nor will it necessarily produce results that see a reduction in alcohol related ED presentations in this timeframe. However, if the study produces reductions in harmful drinking at a personal level, it will add to an ever growing body of literature that illustrates how brief interventions in the ED can reduce harmful drinking and over time will lead to reductions in harmful drinking in the wider population and see a reduction in alcohol related ED attendances; increasing staff and patient safety, wait times and population level harm. The findings from this research may, if appropriate, be used to inform policy about the treatment and discharge of patients presenting with alcohol related injury or illness.

Ethical considerations

Alcohol related injury and illness in the ED are sensitive subjects. People’s emotions are often heightened and sometimes patients are not fully capacitated due to intoxication. Therefore, all potential participants will approached only if they are fully capacitated and without coercion about the intended research project. Considerations will include patient’s rights to refuse to participate, informed consent, confidentiality and storage and disposal of research material. All potential participants will be contacted face to face whilst in the ED, or via telephone by the researcher (and possibly other healthcare professionals) to be informed of the research, have time to ask questions and make a decision about their participation in the study. Patients will be informed that they are not required to participate in the study, and this will not affect their care and treatment in the ED. If the patient decides to participate, they will be required to sign a consent form detailing that they have had the research explained and have decided without coercion to participate in the study, knowing also that they have the right to withdraw from the research at any time. They will also be informed of their confidentiality before signing the consent, specifically that they will remain anonymous and that there will be no data published that could identify them individually as a study participant. Names and phone numbers will be collected solely for the purpose of contacting the participant at the two month post ED phone call, and will not be part of data published. Age and sex will be used as demographic data. This information will be collected on paper, will be stored in a secure lockable facility which only the researcher has access to,
held for 10 years by the University of Auckland, after which point will be destroyed. The proposed research will be put before the Waikato DHB ethics in research committee for ethical approval prior to any research commencement. An ethical consideration of note is that it is not routine, nor policy to offer brief intervention and targeted literature to patients attending Waikato ED with an alcohol related attendance. Therefore, the control group are not having treatment or care withheld, and at the conclusion of the study will be offered the targeted literature.

Summary

“Alcohol is the fifth leading cause of global disease burden worldwide” (Chou et al., 2012, p. 407); and New Zealand is by no means immune to this problem. A survey of households in New Zealand showed the one in four of all households were affected by problem drinking (Imlach Gunasekara et al., 2011). The negative effects of these exposures are well documented, ranging from abuse and neglect, to financial stresses and beyond (Rossow, 2000). A study conducted in the Auckland ED in 2000 revealed that up to 67% of injuries were directly attributable to alcohol between the hours of midnight and six o’clock in the morning (Humphrey, Casswell, & Han, 2003). An increase in problem drinking in young adults is seeing an increased injury and illness burden on EDs, and hospitals; placing an exorbitant strain on the New Zealand health sector. Not only does this increase workload, but also decreases other patients and staff safety, compromising outcomes of care for both the intoxicated and sober patient populations. One study conducted in Wellington went as far as to say that in New Zealand, alcohol was the single biggest risk factor for behavioural disruption to safety in the ED (Imlach Gunasekara et al., 2011). Currently in New Zealand there is no uniform screening and brief intervention tool, and in fact addressing alcohol problems is at the discretion of the health professional assessing the patient. This seems almost counterproductive, as there is endless rigorous research that reinforces the benefit of offering a brief intervention as health promotion aimed at reducing problem drinking. Evidence supports the use of such a tool in the ED setting, specifically identifying that injured patients are at increased receptivity toward accepting help to make changes in their drinking behaviour (Cunningham et al., 2009; D’Onofrio et al., 2008; Forsythe, & Lee, 2012; Nilsen et al., 2008). In accordance with this evidence, the research question formulated is
“What impact does a nurse delivered telephone based interview with accompanying targeted literature around the impact of excessive alcohol consumption have on alcohol use amongst 18-25yr olds attending the Waikato ED?” This research would be performed under the quantitative umbrella, specifically an experimental RCT design. Data would be collected and statistically analysed using the two sample t-test, and findings thereof discussed. Limitations of the study and potential direction for further research will be included. Further research may include a bigger sample size encompassing numerous DHBs and utilising a longer time period to observe changes in harmful drinking patterns. In particular, the reduction of treatment effect seen at one year in some studies (Heather, 2012) may indicate the need to implement an annual follow up phone call with participants; a possible direction for future research.

**Project Timeline**

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<th>Literature review</th>
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Appendix II: Ethical approval

MEMORANDUM TO:

Prof Matthew Parsons
Nursing

Re: Application for Ethics Approval (Our Ref. 011025)

The Committee considered your application for ethics approval for your project entitled Testing the efficacy of a telephone-based brief intervention for alcohol related presentations in patients aged 18-25 years of age attending the Waikato Hospital Emergency Department: A randomised control trial.

Ethics approval was given for a period of three years.

The expiry date for this approval is 19-Dec-2016.

If the project changes significantly, you are required to submit a new application to UAHPEC for further consideration.

In order that an up-to-date record can be maintained, you are requested to notify UAHPEC once your project is completed.

The Chair and the members of UAHPEC would be happy to discuss general matters relating to ethics approvals if you wish to do so. Contact should be made through the UAHPEC Ethics Administrators at humanethics@auckland.ac.nz in the first instance.

All communication with the UAHPEC regarding this application should include this reference number: 011025.

Additional information:

1. Do not forget to fill in the 'approval wording' on the Participant Information Sheets and Consent Forms, giving the dates of approval and the reference number, before you send them out to your participants.

2. Should you need to make any changes to the project, write to the UAHPEC Administrators by email (humanethics@auckland.ac.nz) giving full details of the proposed changes including revised documentation.

3. At the end of three years, or if the project is completed before the expiry, please advise UAHPEC of its completion.

4. Should you require an extension, write to UAHPEC by email before the expiry date, giving full details along with revised documentation. An extension can be granted for up to three years, after which a new application must be submitted.

5. If you have obtained funding other than from UniServices, send a copy of this approval letter to the Manager - Funding Processes, UoA Research Office. For UniServices contracts, send a copy of the approval letter to the Contract Manager, UniServices.

6. Please note that UAHPEC may from time to time conduct audits of approved projects to ensure that the research has been carried out according to the approval that was given.
Appendix III: Patient information sheet and consent form

Testing the efficacy of a telephone based brief intervention for alcohol related presentations in patients aged 18-25 years of age attending the Waikato Hospital Emergency Department: A randomised control trial

Principal Researcher: Matthew Parsons   Co-researcher: Victoria Prendergast

Participant Information Sheet

You are invited to take part in a study, which is being conducted by a researcher based in the School of Nursing at the University of Auckland. The team also involves staff from the Waikato District Health Board (WDHB). You have been selected to take part because you have presented to the emergency department with an injury/illness related to alcohol intake. We are keen to explore risk factors for injury/illness with regards to alcohol and gauge common attitudes toward alcohol consumption.

Your participation is entirely voluntary (your choice). You do not have to take part in the study. If you do agree to take part in the study you are free to withdraw at any time, without having to give a reason. To help you to make your decision, please read this information sheet carefully. You may take as much time as you like to consider whether or not to take part in the study.

What is the purpose of this study?
The purpose of this study is to ascertain the efficacy of a telephone administered brief intervention for alcohol consumption.

What will it involve?
Participation in the study will mean a phone call from the researcher, a maximum of two times. Phone calls will take a maximum of 15 minutes, and will involve questions about alcohol intake and attitudes toward alcohol.

What happens if I decide to take part?
If you decide to take part, it would involve a self-completed questionnaire whilst still in the emergency department, and the follow up phone calls as mentioned previously. You will be asked to sign a consent form to show that you agree to take part. Information provided in the questionnaire and in the phone calls will be confidential. If the information provided is included in a report or published, this will be done in a way that does not in any way identify you. Should you decide to, you may stop the phone call at any time without giving a reason.

What is the time span for the study?
The study is expected to commence early January 2014 and will take approximately one year to complete.
The risks and benefits of this study
There are no foreseeable risks to participating in this study. However, if you have any concerns about your participation, please contact the researcher immediately. Taking part will take some of your time and will require you to answer a series of questions. It will also give you the opportunity to express your views and opinions about treatment preferences for future care options. Your participation may also help inform the treatment others receive in the future.

What will happen to the results of the study?
The findings will be reported in an Honours dissertation and shared with Waikato DHB to inform how we will deliver services to younger people attending ED in the future.

Data storage and disposal
Data collected from individual questionnaires will be stored on a password-protected computer. Other data related to the study (initial questionnaire, consent form) will be stored in a locked filing cabinet at the School of Nursing at the University of Auckland. Only members of the research team will have access to the research materials. All consent forms and copies of the anonymised ACT questionnaires will be kept at the University of Auckland for ten years after the completion of the study as required by Health (Retention of Health Information) regulations 1996 and then disposed of by secure shredding.

Compensation
If in the unlikely event of harm whilst participating in the study, participants are urged to seek medical attention from their GP or the ED in case of emergency. Participants will be considered for coverage under the Accident Compensation Corporation legislation for any injury caused as a result of their participation in the study.

Who is organising the research?
The research is based at the Waikato Hospital Emergency Department through the University of Auckland. The principle researcher is Matthew Parsons. The study has received ethical approval from both the University of Auckland and Waikato Hospital Ethics committees.

Contact for further information
If you require any further information about the study, please contact researcher Victoria Prendergast at: victoria.prendergast@waikatodhb.health.nz
Principle researcher Matthew Parsons at: m.parsons@auckland.ac.nz
University of Auckland, Head of School-Nursing, Judy Kirkpatrick at: j.kilpatrick@auckland.ac.nz
Ethics Chair: For any queries regarding ethical concerns you may contact The Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1143. Telephone 09 373 7599.
Extn 83711
Approved by the University of Auckland Human Participants Ethics Committee on 11/12/13 for 3 years, Reference # 011025
Appendices

The School of Nursing
Faculty of Medical & Health Sciences

Testing the efficacy of a telephone based brief intervention for alcohol related presentations in patients aged 18-25 years of age attending the Waikato Hospital Emergency Department: A randomised control trial

Principal Researcher: Matthew Parsons  Co-researcher: Victoria Prendergast

Consent form

This form will be kept for a period of ten years and then securely destroyed by shredding.

Name of researcher: Victoria Prendergast

I have read the information sheet provided to me and I have understood the nature of the research.

• I have read and have understood the information sheet for the above study. I have had the opportunity to discuss and ask questions about the study and I am satisfied with the answers I have been given. I agree to take part in the study.

• I understand that taking part in this study is voluntary and that I may withdraw myself from the study at any time up to July 2014.

• I understand that the study has been approved by the Waikato District Health Board and that my decision to participate or not will not affect my relationship with nor the treatment I receive at this hospital.

• I understand that by consenting to the study I am agreeing to answer two questionnaires and up to two phone interviews.

• I understand that any information gathered from my interviews may be included in academic publications and that all information will be carefully anonymised prior to publication. No material, which could identify me, will be used in any reports based on this study. I understand that my identity will remain strictly confidential.

• I understand that all information pertaining to the study will be stored in a locked cupboard and on a password protected computer at The University of Auckland for 10 years and then securely destroyed.

• I understand that if I have any questions I can contact the researcher.

Participant:  Signature:  Date:

Researcher:  Signature:  Date:

Email (to request a summary of study findings):

Version 1, Issued November 2013
Appendix IV: Alcohol Consumption Tool (ACT)

Alcohol Consumption Tool

Gender:
Date of birth:
Ethnicity:
Phone number:
Who do you live at home with: parents / family / friends / flatmates / partner / other
(if other please specify):
Is the house: rented / your own / family owned / boarding facility / other (please specify):
Address:

How many standard drinks do you consume a week?

How many standard drinks do you typically consume in a drinking session?

In what form are these drinks?
e.g. wine, beer, cider, RTD’s, spirits, shots

Do you know what the recommended maximum alcohol intake is a week for:
Males –
Females –

Thank you for your participation and your honesty!
(This information is not used to identify individual participants and is used strictly for study purposes.)
Appendices

Appendix V: Targeted literature pack

Ease up on the drink pack made by the ALAC includes the following pamphlets:

- **DrinkCheck**: Is your drinking okay?
- **Alcohol & you**: Facts and effects
- **Like a drink? You can make a change**
  Guide for change and DVD
- **Is your drinking okay?**
- **Yeah or na?**
Appendix VI: AUDIT

AUDIT ALCOHOL SCREENING TOOL

<table>
<thead>
<tr>
<th>Questions</th>
<th>Scoring system</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Your score</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you have a drink containing alcohol?</td>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>How many units of alcohol do you drink on a typical day when you are drinking?</td>
<td>1 - 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year?</td>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>How often during the last year have you found that you were not able to stop drinking once you had started?</td>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>How often during the last year have you failed to do what was normally expected from you because of your drinking?</td>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>How often during the last year have you needed an alcoholic drink in the morning to get yourself going after a heavy drinking session?</td>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>How often during the last year have you had a feeling of guilt or remorse after drinking?</td>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>How often during the last year have you been unable to remember what happened the night before you had been drinking?</td>
<td>Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Daily or almost daily</td>
</tr>
<tr>
<td>Have you or somebody else been injured as a result of your drinking?</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes, during the last year</td>
</tr>
<tr>
<td>Has a relative or friend, doctor or other health worker been concerned about your drinking or suggested that you cut down?</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes, during the last year</td>
</tr>
</tbody>
</table>

Scoring: 0 – 7 Lower risk, 8 – 15 Increasing risk, 16 – 19 Higher risk, 20+ Possible dependence
Appendix VII: AUDIT response advice

Within one week of hospital discharge, the intervention group will receive an "Ease Up On The Drink" pack, which will be sent to their home address in a sealed unidentifiable envelope.

Within two weeks of hospital discharge, the researcher will contact the participant by telephone and using the AUDIT tool, will explore their alcohol consumption patterns and provide specific feedback highlighted in the AUDIT tool around risks relating to alcohol dependence.

Recommended drinks:

![Recommended drinks image]

If participant is identified with an AUDIT score of 8 to 15, encouraged to explore:

- 'Is your drinking ok' tool on [www.alcohol.org.nz](http://www.alcohol.org.nz) or google 'is your drinking ok'
- 'How to access treatment' tab on the ALAC website (named above)
- Self-refer to Community Alcohol & Drug Service (CADS) Ph: (07) 834 6902
- Ring Crisis Assessment & Treatment Service 0800 50 50 50 any time

If participant is identified with an AUDIT score of 16 to 25, they will be encouraged to discuss their alcohol consumption with their GP or self refer to the Community Alcohol and Drugs Service (CADS).

The intervention will follow the clear guidelines developed by Alcohol Advisory Council of New Zealand. Feedback is specific to alcohol consumption only, and will be based on the information the patient receives in the 'Ease up on the drink' pack from the ALAC.
Appendix VIII: Statistical analysis

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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<tbody>
<tr>
<td>Corrected Model</td>
<td>3451.569&lt;sup&gt;B&lt;/sup&gt;</td>
<td>4</td>
<td>862.892</td>
<td>2.811</td>
<td>.055</td>
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<tr>
<td>Intercept</td>
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<td>1</td>
<td>316.813</td>
<td>1.032</td>
<td>.322</td>
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<tr>
<td>Age</td>
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<td>727.374</td>
<td>2.370</td>
<td>.140</td>
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<tr>
<td>Gender</td>
<td>10.184</td>
<td>1</td>
<td>10.184</td>
<td>.033</td>
<td>.857</td>
</tr>
<tr>
<td>@1Drinkspw</td>
<td>2406.450</td>
<td>1</td>
<td>2406.450</td>
<td>7.840</td>
<td>.011</td>
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<tr>
<td>Group</td>
<td>170.276</td>
<td>1</td>
<td>170.276</td>
<td>.555</td>
<td>.466</td>
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<tr>
<td>Error</td>
<td>5832.264</td>
<td>19</td>
<td>306.961</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11888.000</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>9283.833</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .372 (Adjusted R Squared = .240)
References


References


Ministry of Transport. (2011). *Zero blood alcohol concentration (BAC) limit for drivers*


References


