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A typology of alcohol consumption among young people – a Narrative Synthesis

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Abstract

Background

Currently, alcohol consumption levels are significantly higher among younger age groups. However, previous research has noted the diversity of motivations and patterns. These patterns of drinking have yet to be synthesised into a typology. The aim of the current study was to synthesise information from studies that produced types of alcohol consumption among young people.

Method

Quantitative and qualitative literature investigating the different types of drinkers among young people [aged 12-24 years], published in peer reviewed journals, were eligible for inclusion in this systematic review. MEDLINE, PsychInfo and CINAHL were systematically searched for relevant articles published between January 1st 2000 and December 31st 2014. Included papers were critically appraised. A narrative synthesis approach was employed based on guidance from the UK Economic and Social Research Council.

Results

In total, 13 studies were eligible for inclusion: eleven quantitative, one qualitative and one mixed methods. Six classes of drinkers were formed within this typology. Abstainers reported no alcohol consumption. Light drinkers reported drinking small amounts of alcohol infrequently. In comparison social and hedonistic drinkers drank most in social situations and to have fun. Heavy and harmful consumers reported increased volume and frequency of consumption including harmful consequences.

Conclusion

Currently, policy makers are attempting to combat the high levels of harmful alcohol consumption among young people. The current typology provides guidance for targeted interventions in addition to a practical analytic tool in future research.

Keywords: Typology, alcohol, young people, narrative synthesis, review

Introduction

Since the beginning of recorded history alcohol has been consumed for reasons of relaxation, enjoyment and sociability (Rehm et al., 2009). The World Health Organisation reported Europe and America as the heaviest drinking regions in the world (World Health Organization, 2014). Previous research has observed that as the mean consumption pattern of the country increases so too does the consumption pattern of the individual (Rose & Day, 1990; Skog, 1985). Young people (age 18-29) represent a unique sub-section of society who exhibit elevated levels of alcohol consumption (Morgan, 2009). In 2015, the OECD reported that harmful drinking is on the rise among young people (Sassi, 2015). Compounding this, it was recently reported that two-thirds of university students are hazardous alcohol consumers (Davoren, Shiely, Byrne, & Perry, 2015) and between one in five (Sassi, 2015) and two in five (Murphy E. et al., 2015) second-level students (age 16-18) report binge drinking. In a recent review of drinking cultures a homogenisation of drinking cultures in Western societies was noted (Gordon, Heim, & MacAskill, 2011). This is supported by similar industry lobbying (Miller & Harkins, 2010), technological advances, alcohol advertising (Anderson, De Bruijn, Angus, Gordon, & Hastings, 2009), alcohol policies (Brand, Saisana, Rynn, Pennoni, & Lowenfels, 2007) and cultural factors (Gordon et al., 2011) across western society. Within this culture, research highlights the heterogeneous nature of alcohol consumption as young people exhibit varying consumption patterns. Among the various consumption patterns identified in the literature are young people who abstain from alcohol (O'Connor & Colder, 2005). Research also highlights light and moderate levels of alcohol consumption (Hersh & Hussong, 2006) in addition to heavy/binge drinkers (Deshpande & Rundle-Thiele, 2011; Steinhausen & Metzke, 2003) and problem alcohol consumers (Dauber, Hogue, Paulson, & Leiferman, 2009; Reboussin, Song, Shrestha, Lohman, & Wolfson, 2006). Public health policy makers have attempted to tackle population consumption throughout the past number of decades using marketing and supply restrictions (Babor & Caetano, 2005). However, alcohol remains a major cause of global suffering.

Most recently, typologies have been hypothesised as a pertinent public health tool (Eriksson, Tengström, & Hodgins, 2007). The advantage of a typology approach is that it enhances our understanding of a societal phenomenon while making it possible to note patterns across societies. Results from previous research outputs have yet to be synthesised to produce a typology of drinkers. Furthermore the range of types is not usually considered in policy development and implementation (Berg, 2009).

Aim of the study

The current study aims to conduct a systematic review of previous literature in order to develop a typology of alcohol consumption among young people from research in Western countries.

Methodology

A narrative synthesis approach was chosen as it allowed for the inclusion of a broad range of research designs (Popay et al., 2006). The narrative synthesis was undertaken using steps outlined in the guidance, developed by Popay et al (Popay et al., 2006) for the UK Economic and Social Research Council (ESRC). This guidance was developed after the Cochrane Collaboration highlighted that "systematic reviews adopting a narrative approach to synthesis are prone to bias, and may generate unsound conclusions leading to harmful decision" (Popay et al., 2006). Thus, these guidelines aim to "promote transparent reporting and assessment of the robustness of the results" (Marshall, Wolfe, & McKevitt, 2012). The guidelines structure the narrative synthesis as follows: 1) Identifying a theory, 2) Identifying the review process, 3) Identifying studies to include in the review, 4) Extracting information and completing quality appraisal of included studies and 5) Synthesising this information together (Popay et al., 2006).

1. Identifying a theory

Skog's theory of the 'Collectivity of Drinking Cultures' (Skog, 1985) is utilised as a framework for this narrative synthesis. This theory assumes that an individual's peer group and the culture in which they live impact on an individual's drinking. In addition, it suggests that an individual's alcohol consumption increases as the mean consumption for the society in which they live increases. Skog illustrated that factors influencing an individual's drinking tend to combine multiplicatively and that individual drinking behaviours are regulated by direct and indirect social influences on the individual from their peers and other social and cultural networks (Skog, 2001; Skog, 1985). Due to these influences, changes in drinking habits are typically seen as a group phenomenon (Landberg, 2010).

2. Identifying the review process

Quantitative and qualitative literature, published in peer reviewed journals, investigating the different types of drinkers, among a young adult population [aged 12-24 years] were eligible for inclusion in this

review. For quantitative research, articles must have employed factor/cluster analysis to investigate type of alcohol consumer. These complementary methods are underpinned by an underlying logic of classification, attempting to uncover homogeneous units (Krebs, Berger, & Ferligoj, 2000) MEDLINE, PsychInfo and CINAHL were searched for relevant articles separately by quantitative and qualitative research from January 2000 up until December 31st 2014. Full details of the MESH terms and qualitative specific terms (McKibbon, Wilczynski, & Haynes, 2006) used are outlined in Appendix 1 & 2. No language limits were placed on the inclusion of articles.

3. Identifying studies to include in the review

Completed searches were initially title and abstract searched by one reviewer (MPD) and any clearly irrelevant titles were excluded. All papers, which referred to the research question were downloaded and fully reviewed. At this point, a final selection was made and any duplicates from the databases removed. Reference mining was conducted on all included articles. A flow diagram of this is displayed separately for quantitative (Figure 1) and qualitative (Figure 2) findings. English translation of abstracts for relevant papers was available but no full text of a non-English paper was required. References for all included articles were managed in EndNote, a reference package, to keep track of paper selection.

4. Quality appraisal of included studies

Included papers were quality assessed using a modified version of the Effective Public Health Practice Project tool for quality assessment of quantitative studies. The appraisal dealt with 4 main areas; selection bias, study design, data collection methods and analysis. As outlined by Armijo-Olivo et al, sections were rated as strong (3 points), moderate (2 points) or weak (1 point) and an appraisal score out of twelve was defined (Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings, 2012). Higher appraisal scores indicated better quality studies. The RATS (Relevance, Appropriateness, Transparency, Soundness) checklist was used for qualitative studies. This checklist comprised of 25 questions about appropriateness of the method and soundness of the approach. As previously described in Leamy et

al, each question was dichotomised into yes (1 point) or no (0 points) giving a scale which ranged from poor quality, zero, to high quality, twenty-five (Leamy, Bird, Le Boutillier, Williams, & Slade, 2011). Information regarding the target population, sample size, study methodology and main results were extracted from all included studies [see Table 1]. Two authors reviewed articles for quality. Discrepancy in score was discussed with all co-authors to obtain concordance.

5. Synthesising the information

Complete results sections from each included article were extracted for analysis. Using *NVivo 10*, types of drinking behaviour were synthesised from included studies using an inductive approach to content analysis, as it is "a systematic and objective means of describing and quantifying phenomena" (Elo & Kyngäs, 2008). Prevalence of specific types from individual papers was excluded due to the methodological and contextual differences among the studies.

Results

In total, thirteen articles were included in the review; 11 quantitative, one qualitative and one mixed methods study [see Figure 1 & 2]. **Table 1** details an overview of each included study in this synthesis. The six main types of alcohol consumer identified within this narrative synthesis were Abstainers, Light drinkers, Social drinkers, Hedonistic drinkers, Heavy alcohol consumers and Problem alcohol users. No distinct differences in types reported were observed between countries.

Abstainers

Young people in this group reported no alcohol consumption either currently [current non-drinkers] or in their lifetime [lifetime abstainers]. These individuals reported complete abstention from alcohol. In total, five of the included papers reported a type of drinker who refrained completely from alcohol use (Cleveland, Mallett, White, Turrisi, & Favero, 2012; Dauber et al., 2009; Mathijssen, Janssen, van Bon-Martens, & van de Goor, 2012; Steinhausen & Metzke, 2003; van Lettow, Vermunt, Vries, Burdorf, & Empelen, 2013). In general, younger people were more likely to be abstainers than older people (Dauber et al., 2009). Three of the included papers excluded non-drinkers as their aim was to investigate drinking styles (Comasco, Berglund, Oreland, & Nilsson, 2010; Reboussin et al., 2006; Stewart & Power, 2002).

Light drinkers

Most studies reported light alcohol users along with young people who have only experimented or sipped alcohol (Cleveland et al., 2012; Craigs, Bewick, Gill, O'May, & Radley, 2012; Dauber et al., 2009; Demant & Törrönen, 2011; Jackson et al., 2014; Mathijssen et al., 2012; O'Connor & Colder, 2005; Percy & Iwaniec, 2007; Reboussin et al., 2006; Stewart & Power, 2002; van Lettow et al., 2013). Individuals who reported light levels of alcohol consumption drink small amounts of alcohol and have few alcohol related problems. These people may be likely to report alcohol consumption but were unlikely to report risky behaviours. Others in this cluster reported sipping alcohol in their lifetime and

were unlikely to have three or more drinks on one occasion. This group reported low, infrequent amounts of alcohol consumption. Moreover, individuals in this group were more likely to be younger in age (van Lettow et al., 2013) and female (Jackson et al., 2014; van Lettow et al., 2013) when compared to heavy drinkers. They were described as 'consciously sober' by Mathjssen et al, 2012 and were characterised as cautious, unadventurous and family orientated (Mathijssen et al., 2012). Light drinkers reported no instances of heavy drinking.

Social drinkers

Alcohol facilitates group interactions, meeting new people and feeling a sense of belonging in a group (Comasco et al., 2010; Demant & Törrönen, 2011; Jackson et al., 2014). Drinking for social reasons was a clear type of alcohol consumption among these young people (Comasco et al., 2010; Demant & Törrönen, 2011; Mathijssen et al., 2012; Reboussin et al., 2006; Steinhausen & Metzke, 2003; Stewart & Power, 2002). Social drinkers noted drinking at parties with other individuals made them feel more outgoing and social (Comasco et al., 2010). Furthermore they refer to drinking at bars and other social events in groups with friends (Power, Stewart, Hughes, & Arbona, 2005) where they drank alcohol due to social expectation.

Social drinking occasions can occur during a social evening away from home, at home or at a friend's house. A sense of mutual solidarity surrounds group drinking, underpinning this type of consumption (Demant & Törrönen, 2011). Alcohol consumption facilitates an atmosphere for social activities and feelings of inclusion. Their drinking habits are distinct due to their motivation to consume alcohol being driven by peer influence. This complements Skog's theory which stated that an individual's drinking habits are strongly influenced by the drinking habits of an individual's peers or social network (Skog, 2001; Skog, 1985). Social drinkers were more likely to be female when compared to heavy drinkers (Steinhausen & Metzke, 2003) and were older when compared to abstainers (Mathijssen et al., 2012; Steinhausen & Metzke, 2003).Individuals in this group report moderate levels of alcohol consumption. This type of drinking was reported in twelve of the included papers.

Hedonistic drinkers

The majority of the included papers portrayed a hedonistic approach to alcohol use (Cleveland et al., 2012; Comasco et al., 2010; Craigs et al., 2012; Dauber et al., 2009; Demant & Törrönen, 2011; Mathijssen et al., 2012; Reboussin et al., 2006; Stewart & Power, 2002; van Lettow et al., 2013). Hedonism is the view that pleasure is the only good thing in life and can be defined by viewing "pleasure as the only possible object of desire, because all motivation is based on the prospect of pleasure" (O'Shaughnessy & O'Shaughnessy, 2002). An integral part hedonistic drinking is the use of alcohol to change one's mood, for enjoyment, to enhance social situations, to reduce inhibitions and to get intoxicated and experiment (Comasco et al., 2010). These individuals enjoyed being drunk and drank to feel pleasure (van Lettow et al., 2013). This style of drinking is associated with impulsive drinking behaviours and drinking larger amounts of alcohol with the intention of having fun and enjoyment (Stewart & Power, 2002). This group of drinkers are distinct from social drinkers in their self-indulgent motivation to consume alcohol. Instead of being motivated by peers and social groups, hedonistic drinkers are driven by their personal need to feel pleasure, overcome reservations, and enjoy themselves. These individuals are more likely to be older than light drinkers (Craigs et al., 2012), and less likely to be female than other groups (van Lettow et al., 2013).

Heavy drinkers

The majority of included papers [12] discussed patterns of heavy alcohol consumption among young people. Heavy alcohol consumption ranged in name from "weekend risky drinker" to "habitual drinkers"; describing individuals who would consume harmful levels alcohol on a regular basis. Individuals who fell within heavy alcohol consumption groups would report heavy drinking, high rates of consequences due to alcohol consumption, high risk drinking behaviours, and regular patterns of alcohol consumption (Cleveland et al., 2012; Comasco et al., 2010; Craigs et al., 2012; Dauber et al., 2009; Demant & Törrönen, 2011; Jackson et al., 2014; Mathijssen et al., 2012; O'Connor & Colder,

2005; Percy & Iwaniec, 2007; Reboussin et al., 2006; Steinhausen & Metzke, 2003; Stewart & Power, 2002). This group would consume higher amounts of alcohol and consume alcohol more frequently than their peers who report light drinking or social levels of drinking. Heavy drinkers were associated with early initiation into alcohol consumption, drinking to intoxication and binge drinking (Cleveland et al., 2012; Demant & Törrönen, 2011; Reboussin et al., 2006; Stewart & Power, 2002). Adverse consequences for this type of alcohol consumer are reported in the literature, including hangovers, blackouts, getting sick, feeling depressed, losing control and having an outburst of anger. In general, men (Reboussin et al., 2006; Sacco, Bucholz, & Spitznagel, 2009) and those at the upper age limit of this study (Steinhausen & Metzke, 2003) were more likely to report heavy drinking.

Problem alcohol users

Problem alcohol users and the negative aspects associated with this type of alcohol use were described in eleven of the thirteen included studies (Cleveland et al., 2012; Comasco et al., 2010; Craigs et al., 2012; Dauber et al., 2009; Demant & Törrönen, 2011; Jackson et al., 2014; Mathijssen et al., 2012; Percy & Iwaniec, 2007; Reboussin et al., 2006; Stewart & Power, 2002; van Lettow et al., 2013). Problem alcohol users are described as individuals who reported solitary drinking, drinking in the morning, individuals who drink on a daily basis and those who report consuming alcohol and driving (Cleveland et al., 2012; Dauber et al., 2009; Stewart & Power, 2002). A number of papers also reported their drinking pattern placing them in unwanted sexual situations or regretting sex (Cleveland et al., 2012; Dauber et al., 2009). Problem alcohol users are described as such because of the negative outcomes associated with their alcohol consumption.

In addition, a number of studies highlighted that problem drinkers are fuelled by negative emotions and a wish to change or improve mood through heavy alcohol consumption. Physiological and pharmacological side-effects among problem alcohol users are frequent. They describe drinking "to think of something else/to forget my worries, my problems" (Comasco et al., 2010). Compared to

abstainers/light drinkers this group is older (Jackson et al., 2014) and predominantly male (Jackson et al., 2014; Percy & Iwaniec, 2007).

Discussion

Alcohol consumption is a leading cause of suffering in society (World Health Organization, 2009). Reports from different countries reveal that young people today drink more, with increasing emphasis on binge drinking and drunkenness than earlier generations (Carey, Scott-Sheldon, Carey, & DeMartini, 2007; McCabe, 2002; Murphy & Murphy, 2010). This is said to have increased over the last 45 years. Authors have previously hypothesised this as the 'psychoactive revolution' and by the 1990's, a decade defined by a 'new culture of intoxification' had manifested, peaking in 2001 (Järvinen & Room, 2007). This cultural shift is further compounded by the fact that young adult consumption levels remained steady for the 1970's and 80's but doubled in the 1990's (Järvinen & Room, 2007). The current research describes a synthesis of previously published typologies of alcohol consumption identified in young people living in Western society. Systematic reviews furnish policy makers with the entire range of relevant findings from research on a particular topic, ensuring they are not misguided by the results of one or two studies (Akobeng, 2005). The authors believe this review will be a robust analytic tool in future research in addition to providing novel information for public policy makers when tailoring health promotion interventions.

Abstainers and light drinkers may serve as a protective and moderating factors when socialising among peers. Recently, an Australian report mooted that these individuals could be described as controlled and conscientious (VicHealth, 2013). These individuals look out for others when socialising. Health promotion practitioners have recommended that these individual's drinking attitudes should be "encouraged and supported as the ideal drinking attitude" (VicHealth, 2013). The protection peers offer each other against engagement in excessive alcohol consumption should be emphasised (Quinn & Bussey, 2015). This can be achieved by "challenging society's negative image of moderate drinking and empowering people to abstain or drink less" (VicHealth, 2013).

As previously noted, "the classes of drinking occasions when heavy drinking occurs are of special interest from the preventive perspective" (Mustonen, Mäkelä, & Lintonen, 2014). Skog emphasises, "egos drinking is very strongly influenced by alter's drinking in group sessions" (Skog,

1985) highlighting the importance of an individual's peer group and culture on their drinking pattern (Skog, 1985). This complements the current research where the influence of peer drinking is evident. Young people highlight their motivators in terms of 'house parties', excessive drinking and enjoyment which is apparent in social, hedonistic and heavy consumers. These correspond to the previously described motives: 'social' and 'enhancement' (Quinn & Bussey, 2015; Stewart, Zeitlin, & Samoluk, 1996).

Individuals anticipate more arousal from risky behaviours (Katz, Fromme, & D'Amico, 2000), complementing our finding of hedonistic drinking. Hedonistic drinking has previously been noted as a culture of alcohol consumption among our society (Gordon et al., 2011; Hurlbut & Sher, 1992). It is sustained by a technological era of instant gratification to which young people have been excessively exposed. As outlined by Gordon, "rules governing drinking behaviours vary and are often informal, socially negotiated and acquired via the socialisation process" (Gordon et al., 2011). It is these social cultures, which govern and reflect attitudes towards alcohol. For example, Germany tend to value individuals who can hold one's drink while the UK appear to celebrate intoxication and high levels of alcohol consumption. Gordon defines these variations in "levels of drinking and drunkenness as the 'hedonism' dimension to drinking cultures" (Gordon et al., 2011). These cultural norms represent an important way of regulating drinking behaviour.

Recommendations for Policy & Health Promotion Strategies

Public policy makers have attempted to combat alcohol use with a number of legislative measures. Despite this, consumption levels have continued to increase (Davoren et al., 2015). This typology gives us further insight into the drinking patterns of young people. For example, abstainers give insight into their reasons for not consuming alcohol (Dauber et al., 2009; Mathijssen et al., 2012; Steinhausen & Metzke, 2003), while light drinkers give insight into a form of conscious experimentation which occurs as young people explore alcohol consumption while remaining conscious and in control of their bodies (Dauber et al., 2009; Hersh & Hussong, 2006; Huang, DeJong,

Schneider, & Towvim, 2011; Mathijssen et al., 2012; Reboussin et al., 2006). These consumption patterns are also observed in comparatively older populations (Sacco et al., 2009), and in other risk taking activities (Fountain et al., 1999). Although harms caused by these drinking styles are negligible, national policy and health promotion strategies aimed toward education, taxation and restrictions on opening hours remain crucial to ensuring these individuals do not transition to heavier patterns of alcohol consumption. In addition, the socio-cultural norms and practices upheld by these groups are useful in the tailoring positive health promotion strategies, aimed at altering the negative image of abstinence and light drinking among young people (Quinn & Bussey, 2015).

In the past decade a surge in predrinking has been observed with adolescents predrinking before parties or before going out (Kuntsche & Gmel, 2013). This was observed in a typology which was formed almost 50 years ago (Park, 1966). This is being fuelled by the availability of cheap alcohol through off-sales and the current phenomenon of the 'house party' (Wells, Graham, & Purcell, 2009). The most effective measure to reduce the harms caused by this style of drinking is minimum unit pricing. This measure would increase the price of off-licence sales thus reducing the consumption among hedonistic drinkers (The Scottish Government, 2013). A reduction in the density of outlets surrounding colleges, universities and schools would also reduce consumption and patterns of harm. Culturally, a ban on the alcohol industry providing sports sponsorship would break the view of alcohol as a cultural artefact (McGee, 2013). However, for young people reporting problem drinking and addictive tendencies, their motives for drinking are centred on coping (Comasco et al., 2010). Individual strategies will be required among these individuals such as brief intervention therapy, support structures and clear pathways of referral to addiction clinics.

Many screening tools employed by health professionals define young people as either hazardous or non-hazardous drinkers. The protection of this vulnerable population would benefit from the development of a screening tool which incorporated the typology presented in this synthesis. This typology would aid the health professional to tailor brief interventions and advice, thus improving patient care (Winograd, Steinley, & Sher, 2015). In addition, health promotion practitioners should

employ the current review to understand the culture of alcohol consumption further by tailoring effective health promotion strategies to influence these specific groups and reduce consumption (Santos, 2013).

Strengths & Limitations

This synthesis has a number of strengths. A range of databases were reviewed to obtain the breath of literature available researching drinking types. Relevant articles, regardless of language were considered. No previous typology had been developed. As studies assessing drinking type had utilised quantitative and qualitative research, a robust process was used to reduce the weaknesses of a narrative syntheses approach (Popay et al., 2006).

However, the synthesis is limited to the published data which tends to range in quality. Most of the included studies were cross-sectional. Moreover, the synthesis was constrained by the broad age limits used in previous research. Those aged less than 18 will report a distinctly different alcohol consumption compared to their peers aged 18 years and older. Furthermore, policy implications for those above and below the legal drinking age will be distinctly different. Research questions in the included articles were distinct across each study. The impact of this is difficult to control. Finally, answers may be influenced by recall and/or social-desirability bias due to participants disclosing a range of risk-taking behaviour.

A typology itself can be described as a "systematic method for classifying similar events, actions, objects, people or places into distinct groupings" (Berg, 2009). The main objective of a typology is to provide additional information on the material to the reader. This is executed by attempting mutually exclusive categories, making sure all elements have been accounted for and ensuring the categories make theoretically meaningful appraisals of the literature. However, the idea of a typology can be a reductionist one, loosing nuances from data which may better describe the different aspects of alcohol consumption. Many argue this is the beauty of the method as it "permits

the researcher to present the data in an organised and simple fashion, allowing the reader to better understand the explanations offered" (Berg, 2009).

Conclusion

The current synthesis outlines a typology of alcohol consumption among young people in western societies. It displays a varied prevalence of reported alcohol use for specific groups of young people implying that the need for alcohol interventions is not uniform. Thus, public policy should address the specific needs of each of the targeted groups (Francis, Grosskurth, Changalucha, Kapiga, & Weiss, 2014) through a mix of population-level and individual measures. Future public policy should consider this typology when developing alcohol interventions, screening tools and tailoring motivational interventions.

Declaration of Interest Statement

The authors declare that there are no competing interests.

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Table 1: Studies investigating the different types of alcohol consumers among young people (n=13)

Ref	Author	Year / Country	Design	Sample	Age	Method	Data analysis	Appraisal scores	Types identified
#1	Jackson et al (Jackson et al., 2014)	2014 / New Zealand	An anonymous computer-assisted survey was self-administered to 9,107 New Zealand secondary school students. These students were from	115 schools from 389 eligible schools were chosen. 189% of eligible students from each school were randomly chosen.	14-17 years	An anonymous computer-assisted survey	Multinomial regression	10/12	A Four class structure was determined following latent class analysis **1) Low-risk** **2) Moderate-risk** **3) High-risk** 4) **Very high-risk**
#2	Camasco et al (Comasco et al., 2010)	2010 / Sweden	Mixed methods - Grounded Theory & Cross-sectional survey	11,374	Ages ranged from 15-22 [most were 15-19 except for those aged 19-22 after three years follow up]	Qualitative & Quantitative –> in-depth interviews and a questionnaire	Quan: Factor analysis Qual: Not described	Quant: 9/12 Qual: Weak	1) **Social-enhancement motive** 2) **Coping motive** 3) **Dominance motive**
#3	Dauber et al (Dauber et al., 2009)	2009 / United States	Longitudinal study	2,948	13-19 years	Survey	Latent class analysis	9/12	White girls: 4 class model 1) **Abstainers** 2) **Experimenters** 3) **Moderate drinkers** 4) **Heavy drinkers** African American Girls: 3 class model 1) **Abstainers** 2) **Experimenters** 3) **Problem drinkers**

Ref	Author	Year / Country	Design	Sample	Age	Method	Data analysis	Appraisal scores	Types identified
#4	Mathijssen et al (Mathijssen et al., 2012)	2012/ the Netherlands	Cross-sectional study	3,230	12-18 years	Survey questionnaire	Exploratory factor analysis	9/12	Latent Class analysis uncovered five clusters 1) **Ordinaries** 2) **High Spirits** 3) **Consciously Sobers** 4) **Ordinary Sobers** 5) **Socials**
#5	O'Connor & Colder (O'Connor & Colder, 2005)	2005 / United States	Cross-sectional survey	533 freshman university students	21 or less	Self-completed questionnaires distributed among psychology departments	Latent class analysis	9/12	A five class model was found to have the best fit for both men and women. The classes were as follows 1) **Light drinkers or abstainers** 2) **Heavy occasional drinking without impairment** 3) **Heavy occasional drinking with impairment** 4) **Very heavy occasional drinkers with impairment** 5) **Heavy frequent drinkers with impairment**
#6	Percy & Iwaniec (Percy & Iwaniec, 2007)	2007 / United Kingdom	Cohort Study	6,516 respondents	16 years	Postal questionnaires	Latent Class Analysis	9/12	Five latent classes were uncovered in the following research: **1) Limited** **2) Occasional** **3) Moderate** **4) Heavy** 5) **Hazardous**

Ref	Author	Year / Country	Design	Sample	Age	Method	Data analysis	Appraisal scores	Types identified
#7	Reboussin et al (Reboussin et al., 2006)	2006 / United States	Cross-sectional survey	4,056 respondents who qualified as drinkers	16-20	Telephone survey – First round in 1999, repeated in 2000, & 2002	Latent Class Analysis	9/12	A three class model was chosen as a best fit following analysis. The classes were described as follows: 1) **Non-problem drinkers** 2) **Risky problem drinkers** 3) **Regular problem drinkers**
#8	Stewart & Power (Stewart & Power, 2002)	2011 / United States	Cross-sectional survey	950 high school students	9th – 12th Grade ~14-18 years	Self-completed Questionnaire	Cluster analysis	9/12	A total of 950 adolescent drinkers were included in the final cluster analysis. Eight clusters were uncovered: 1) **Light drinkers** 2) **Parent drinkers** 3) **Family occasion drinkers** 4) **Date drinkers** 5) **Moderate-friend drinkers** 6) **Party drinkers** 7) **Outdoor drinkers** 8) **Heavy multiple-context drinkers**
#9	Cleveland et al (Cleveland et al., 2012)	2012 / United States	Cross-sectional survey	264	18-22 years	Web-based survey	Latent Class Analysis	9/12	A 4 class model was chosen as a best fit following analysis. The model uncovers the following classes: 1) **Current non-drinkers**. 2) **Weekend light drinkers** **3) Weekend risky drinkers** 4) **Daily drinkers**
#10	Craigs et al (Craigs et al., 2012)	2011 / United Kingdom	Longitudinal study	119 students completed 162 originally registered interest	Under 23	Electronic questionnaire	Cluster analysis	8/12	Four distinct clusters of alcohol behaviours were taken from the analysis. These were: 1) **Non or light drinkers** 2) **Less frequent drinkers who binge** 3) **Habitual drinkers who binge infrequently** 4) **Habitual drinkers who binge frequently**
#11	van Lettow et al	2013 / the	Individual were approached in	149 respondents, 37% were men	Mean age = 20.6 years	Self-completed questionnaire	Multilevel latent class analysis	8/12	Cluster of respondents: 1) **Focus-on-control class**

Ref	Author	Year / Country	Design	Sample	Age	Method	Data analysis	Appraisal scores	Types identified
		Netherlands	public areas of Rotterdam and Delft, asked their age, to read an information sheet, sign a consent form and to return the survey by mail.						2) **Focus-on-hedonism** 3) **Contrasting extremes prototypes** 4) **Focus-on-elation**
#12	Steinhausen & Winkler-Metzke (Steinhausen & Metzke, 2003)	2003 / Zurich, Switzerland	Sample from ZESCAP form cohort of ZAPPS which is a longitudinal study	794	13-20 years	Questionnaire	Multivariate analysis of co-variance model (MANCOVA)	5/12	Based on seven yes/no questions, four subsamples were uncovered. The groups were comprised of the following: 1) **Abstainers:** N=252, 31.7% 2) **Social drinkers:** N=337, 42.4% 3) **Heavy drinkers**: N=130, 16.4% 4) **Problem drinkers**: N=75, 9.4%
#13	Demant & Torronen (Demant & Törrönen, 2011)	2011 / Finland & Denmark	Qualitative focus group exploration	95 participants	17-23 years	16 Focus groups	Qualitative [not described]	Moderate	1) A 'cosy get-together' similar to a picnic session where a **single beer could be enjoyed**. 2) **Heroic drinking behaviours** - Different situations are suited to different drinking styles. This form of drinking aids in breaking down barriers and bringing people closer through heavy drinking episodes. To the students, heroic drinking is usually met with no hindrances and ends with passing out. 3) Finally, students discussed the idea of **playful drinking**. Individuals make eye contact or gaze at each other in a playful way. This aids them in identifying these individuals to a group where they gain some collective identity or belonging.

Figure 1: Number of articles retrieved in quantitative research

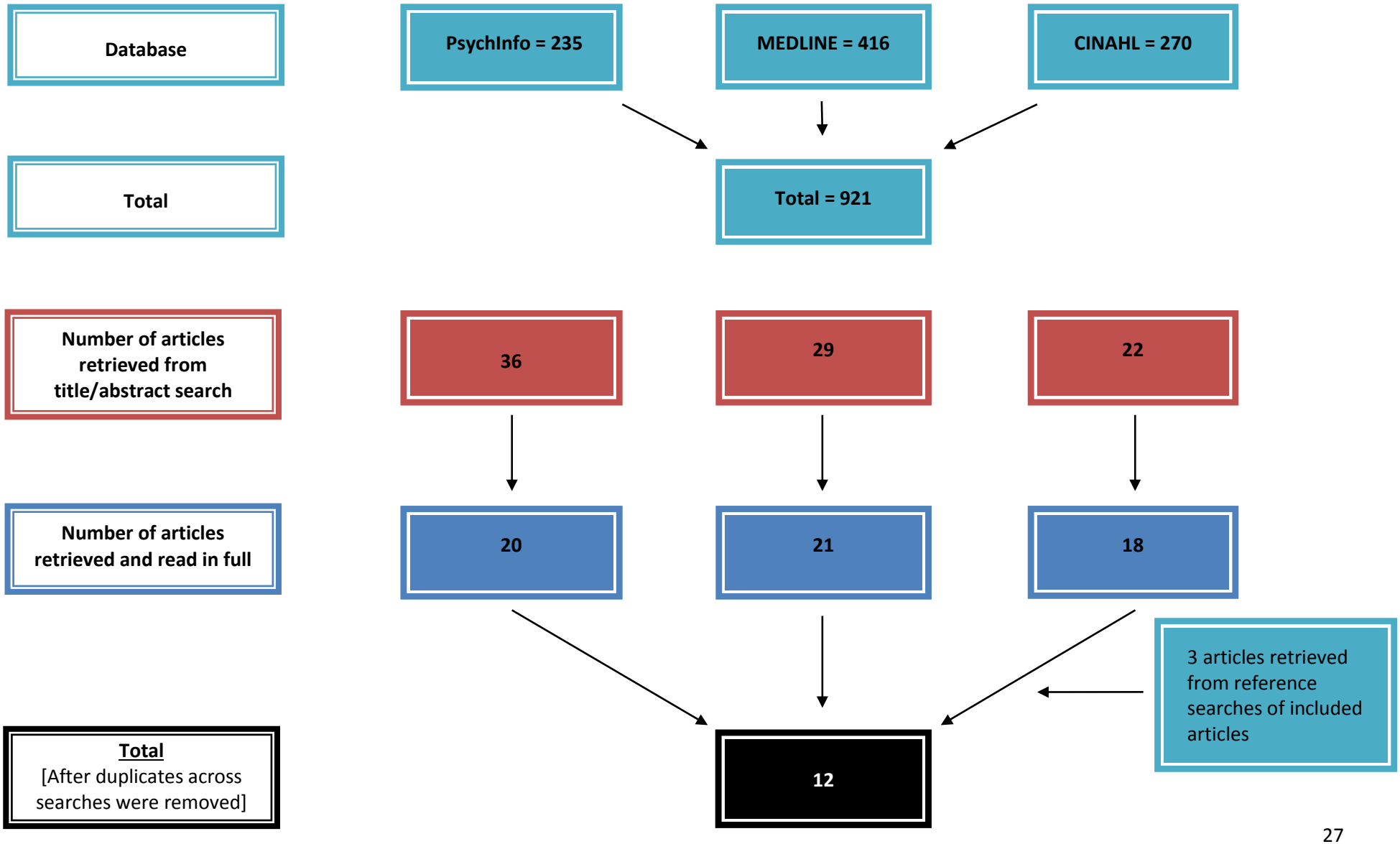


Figure 2: Number of articles retrieved in qualitative research

