**Acknowledgments**

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**Plain Language Summary**

**The knowledge and skills to access, understand and use health information is particularly important in relation to alcohol use. We look at how alcohol literacy is currently understood and defined in research, policy and practice and we compare this to definitions of health literacy. We found that alcohol literacy is narrowly defined and does not make full use of the health literacy concept. A broader definition of alcohol health literacy would be helpful when developing alcohol education.**

**Abstract**

**Aim:** This study uses an innovative methodology to understand the implications of applying the emerging concept of health literacy to other contexts using the example of alcohol.

**Method**: An Evolutionary Concept Analysis combined with the principles and standards of the Systematic Review process enables a rigorous analysis of the conceptual representation of alcohol health literacy.

**Key results:** Alcohol health literacy includes a wide range of attributes that encompass many different health literacies beyond simply the capacity to understand alcohol-related harms and use that information in decision-making. Alcohol health literacy empowers people to understand alcohol marketing and messages and how alcohol information is distributed through social networks. It is an outcome of media-related alcohol education and its consequences include health action skills and realistic expectancies of alcohol.

**Conclusion:** The focus on health literacy which emphasises not only individual skills but also draws attention to the social determinants of alcohol use and how alcohol health literacy is shaped by social networks and interactions provides important lessons for alcohol health promotion interventions. Health literacy when applied to alcohol includes many different domains and the innovative method used here provides a framework to develop interventions that build health literacy in different contexts.

**Key words: alcohol literacy; alcohol health literacy; health literacy; concept analysis; integrated review**

**Background**

Health literacy has emerged as a key field of activity in health promotion and is a central pillar in the WHO Shanghai statement (WHO, 2017). It states that both health and literacy are critical resources for everyday living and that health literacy directly affects people’s ability to not only act on health information but also to take more control of their health as individuals, families and communities and change those factors that constitute their health chances, such as access to healthy food, opportunities for physical activities, and active and informed involvement in health policy discussion (Nutbeam, 2000).

There has been a huge rise in interest in the concept of health literacy. In 2012, there were 17 definitions of health literacy and 12 conceptual models (Sørensen et al., 2012), but by 2016 a review found over 250 definitions (Malloy-Weir, Charles, Gafni & Entwistle, 2016). One current widely accepted definition describes health literacy as ‘the motivation, knowledge and competencies to access, understand, appraise and apply health information in order to make judgments and take decisions in everyday life’ (Sørensen et al., 2012, p 3). A number of explanations have been developed that describe the constructs and variables that either predict health literacy rates (Berkman, Sheridan, Donahue, Halpern & Crotty, 2011) or describe the outcomes associated with the level of health literacy in a population, e. g. those living with diabetes (Schillinger et al., 2002), cancer (Morris et al., 2013) or children and young people (e. g. Paakkari, Torppa, Villberg, Kannas, & Paakkari, 2018; Parisod, Axelin, Smed, & Salanterä, 2016). An early analysis of the health literacy concept (Speros, 2005) described the defining attributes of health literacy as reading and numeracy skills, comprehension, the capacity to use information in healthcare decision-making, and successful functioning as a healthcare consumer including navigating healthcare systems. These attributes reflect the health literacy domains suggested by Nutbeam (2000) of what is called functional health literacy – basic literacy skills applied to health context and being able to act upon health information regarding health risks and health service use – and interactive health literacy – more advanced literacy and social skills to derive meaning from different forms of communication and interact with health professionals. Besides functional and interactive health literacy, Nutbeam (2000) also included the domain of critical health literacy in his typology (Nutbeam, 2000). An analysis of critical health literacy (Sykes, Wills, Rowlands & Popple, 2013) revealed a distinct set of characteristics of advanced personal skills, health knowledge, information skills, effective interaction between service providers and users, informed decision-making and empowerment, including political action as key features of critical health literacy. In the evolving conceptual analysis of health literacy in recent years, different domains have been discussed, those commonly cited and generally applied are summarised in Table 1. These include public health literacy (Freedman et al, 2009) which draws attention to the importance of abilities to make decisions and act on the broad array of structural and environmental factors determining individual health and wellbeing. Distributed health literacy (Edwards, Wood, Davies & Edwards, 2015) is another widely discussed domain which values the health literacy available within the social environment of an individual, such as friends, families, colleagues, and communities. Yet despite the increase in the discourse around health literacy that some have likened to a social movement (Huber, Shapiro & Gillaspy, 2012), little attempt has been made to analyse how the concept of health literacy is being applied to different contexts, especially not to alcohol.

Table 1: Definitions of relevant health literacy domains

|  |  |
| --- | --- |
| Health literacy domains | Associated health literacy definitions |
| Functional health literacy | ‘Functional health literacy describes the possession of literacy skills sufficient to acquire and act on information on defined health risks and recommended health services use, and compliance with recommended health and disease management strategies.’ (Nutbeam, 2017, p 7) |
| Scientific literacy applied to health literacy | ‘Science literacy refers to levels of competence with science and technology, including some awareness of the process of science.’ It includes the ‘knowledge of fundamental scientific concepts, [the] ability to comprehend technical complexity, an understanding of technology and an understanding of scientific uncertainty and that rapid change in the accepted science is possible.’ Zarcadoolas et al., 2005, p 197) |
| Interactive health literacy | ‘Interactive health literacy describes the possession of literacy skills required to extract, understand and discriminate between health information from different sources, and to apply new information to changing circumstances. (…) [T]hese literacy skills also enable a higher level of interaction with different sources of information, including with clinicians providing advice.’ (Nutbeam, 2017, p 7-8) |
| Critical health literacy | ‘Critical health literacy describes the most advanced cognitive skills which, together with social skills can be applied to critically analyse health information from a variety of sources, and to use this information to exert greater control over both personal health decisions and wider influences on those decisions.’ (Nutbeam, 2017, p 7-8) |
| Distributed health literacy | Distributed health literacy describes that individuals draw ‘on the health literacy abilities, skills and practices of others as a resource to help them seek, understand and use health information to help manage their own health and make informed choices’ (Edwards et al., 2013, p 5). |
| Public Health Literacy | Public health literacy is defined ‘as the degree to which individuals and groups can obtain, process, understand, evaluate, and act upon information needed to make public health decisions that benefit the community.’ (Freedman et al., 2009, p 448) |

Alcohol is a major public health priority. It is well known that there is a causal relationship between alcohol consumption and a range of mental and behavioural disorders, including alcohol dependence, non-communicable conditions such as liver diseases, some cancers, cardiovascular diseases, as well as injuries resulting from violence and road accidents (WHO, 2011). In 2012, 5.1% of the global disease burden was due to the harmful use of alcohol, and an estimated 3.3 million people died from alcohol-related conditions that year (WHO, 2014). The harmful use of alcohol my also bring significant social harms, including violence, family disruption and domestic violence (WHO, 2011). A range of societal factors, cultural norms, neighbourhoods, and social contexts may be associated with alcohol misuse (Sudhinaraset, Wigglesworth & Takeuchi, 2016). Guidelines on safer drinking exist in many countries (Kalinowski & Humphreys, 2016) and there is recognition that people need information to support them to make healthier choices. Yet studies show that awareness of alcohol-related harms and of safe drinking levels is low (e.g. Bowden, Delfabbro, Room, Miller & Wilson, 2014; De Visser & Birch, 2012).

Whilst the relevance of health literacy to alcohol prevention and health promotion has been highlighted, to date no systematic analysis exists that addresses alcohol-related health literacy. Therefore, the aim of this study is to systematically identify available alcohol health literacy or resemblant concepts, to apply a concept analysis, and provide an understanding what then is meant by alcohol health literacy and what would describe an alcohol health literate person.

**Methodological Framework**

Concept analysis, as a research methodology, offers the opportunity to clarify, refine and sharpen concepts in order to progress understanding where there may be competing, inconsistent or underdeveloped perspectives (Rodgers, 2000). As concepts (such as health literacy) become more widely used in the literature, their use may become expanded and as a result become confused with similar concepts (Cowles, 2000), such as health education or empowerment (Sykes et al., 2013). Without such shared conceptual clarity, difficulties emerge in communicating, developing theory, operationalising, measuring or identifying outcomes associated with a concept. Introduced by Wilson (1963) in the 1960s and developed into a number of models in the 1980’s (Rodgers, 1993), concept analysis is now an established research methodology, particularly within the field of nursing. Common to many of the models (Haase, Leidy, Coward, Britt & Penn, 2000; Rodgers, 2000, 1993; Walker & Avant, 1995; Wilson, 1963) is the systematic analysis of key elements of the concept, such as (a) the attributes of the concept which refers to the key characteristics that define the concept, (b) references or what the concept is used to refer to, (c) antecedents or the factors that need to be in place in order for the concept to occur, (d) consequences or what happens as a result of the concept, (e) surrogate or resemblant terms that could be used instead of the concept. Undertaking a concept analysis of alcohol health literacy can add to the body of work defining health literacy by identifying whether the concept acquires other attributes when applied to other topics, settings or population groups.

This paper adopts a rigorous and transparent approach to concept analysis, addressing criticisms that concept analyses can be arbitrary and lacking in necessary research rigour (Draper, 2014; Risjord, 2009). It has combined the model of Evolutionary Concept Analysis (Rodgers, 2000, 1989) with the principles and standards found within a Systematic Review process as shown in Figure 1. This process therefore systematically, transparently, and comprehensively identifies, selects, analyses and synthesises the body of literature where conceptual expression of alcohol health literacy is found in order to identify the attributes, antecedents, consequences, references, surrogate and resemblant concepts and contextual variations. The strategies outlined below, are built into the process to minimise bias and ensure a more robust analysis of the conceptual representation of alcohol health literacy in the literature.

Figure 1: The combining of an Evolutionary Concept Analysis with Systematic Review principles

1. **Identify concept of interest and associate expressions (including surrogate terms)**

* Defining the scope of the review question
* Identifying search synonyms

1. **Identify and select an appropriate realm (setting and sample) for data collection**

* Identifying data sources (databases, grey literature sources, policy sources, ancillary searching, reference tracing)
* Developing search strategy
* Developing inclusion and exclusion criteria

**3. Collect data relevant to identify:**

1. **The attributes, antecedents and consequences of concept**
2. **The contextual basis and variations of the concept**

* Conduct search
* Title and abstract screening against inclusion and exclusion criteria (2 researchers)
* Full text screening against inclusion and exclusion criteria (4 researchers)
* Data extraction using piloted table including fields of; attributes, antecedents, consequences, surrogate terms, resemblant terms and context.

**4. Analyse data regarding the above characteristics of the concept**

* Summary of findings table listing studies and characteristics of concept
* Narrative synthesis

**5. Identify an exemplar of the concept**

* Theoretical mapping

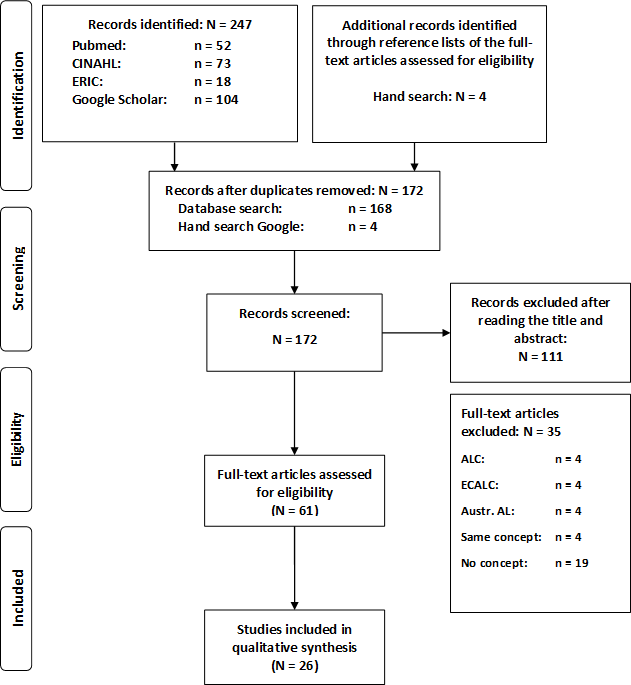
**6. Identify implications, hypothesis and implications for further development of the concept**

Evolutionary concept analysis takes a relativist position and recognises the developing nature of concepts, explicitly seeking to identify the influence of context on a concept and its relationship with overlapping concepts. It works to develop a cluster of attributes that are assessed in relation to their resemblance to a concept rather than because they strictly correspond to it. This emphasis is relevant to a study on alcohol health literacy which is a relatively new and evolving concept, which has clear overlap with more established concepts, such as health literacy and media literacy, and which has, as its basis, the application of an existing concept, health literacy, within a particular context of alcohol. Alcohol health literacy also sits within a relativist discourse of health literacy which increasingly recognises the context specific nature of the term (de Wit et al., 2018; Pleasant et al., 2016; Rudd, 2015; Nutbeam, 2008).

A systematic search was conducted in three major databases (PubMed, Cinahl, Eric), Google Scholar and across ten pages of Google to find published peer reviewed papers, grey literature and policy documents pertaining to alcohol health literacy. The search strategy used the terms “alcohol literacy”, “alcohol health literacy” and/or “health literacy” in keywords or the titles. Duplicate papers were then removed. Papers or documents were included to be screened if the term “alcohol literacy” or “alcohol health literacy” or “health literacy” or “literacy” within the context of alcohol appeared in the title or abstract.

A team of two researchers screened the titles and abstracts for eligibility according to these inclusion/exclusion criteria. A total of 247 papers were found via the database searches and a further four papers were found via hand searching in Google`s Search Engine. Duplicates (n=79) were removed and 111 papers were deemed to not be relevant as shown in Figure 2.

Figure 2: PRISMA Flow Diagram (Moher et al 2009): Alcohol health literacy



ECALC: Expectancy Challenge Alcohol Literacy Curriculum, ALC: Alcohol Literacy Challenge, Austr. AL: Australian Alcohol Media Literacy

Papers were identified for full text review (n=61) and after reading by a team of four researchers, 19 were then excluded because they did not identify any elements of the concept and no data could be extracted. Where multiple papers were found using the same conceptual definition: Expectancy Challenge Alcohol Literacy Curriculum (ECALC) (n=4), Alcohol Literacy Challenge (ALC) (n=4), Australian Alcohol Media Literacy (Austr. AL.) (n=4) or by the same authors using the same concept (n=4), these were then excluded. Where an author had authored different studies using different concepts, both papers were included (Banerjee, Greene, Magsamen-Conrad, Elek & Hecht, 2015; Banerjee, Greene, Hecht, Magsamen-Conrad & Elek, 2013; Austin & Johnson, 1997; Austin, Muldrow & Austin, 2016).

A data extraction form was developed and piloted with a primary research paper (Anderson & Rehm, 2016) and a document (DeBenedittis, 2011). The data to be extracted pertained to the elements of the concept of alcohol health literacy as described or understood by the authors of the paper and included the (a) the attributes of the concept (i.e. key characteristics that define the concept) (b) antecedents (the factors that need to be in place in order for the concept to occur), (c) consequences (what happens as a result of the concept) (d) surrogate terms that could be used instead of the concept, (e) resemblant terms or other concepts that show similarity, and (f) contextual variants (observed variations in how the concept is applied in different contexts). Once extracted, the data were coded for analysis in order that patterns in the data could be identified. This process was undertaken by two researchers.

Following the narrative synthesis, a theoretical mapping took place with two stages. The first stage described the application of health literacy to alcohol by mapping or coding the results of the review, identifying the characteristics or descriptors of alcohol health literacy against existing domains of health literacy (step 4 in Figure 1). All the research team coded the results independently. The second stage was the construction of an exemplar case which pulled the analysis together in a model of alcohol health literacy including all of the attributes discovered (Rogers, 2000)

**Mapping the results: the concept of alcohol health literacy**

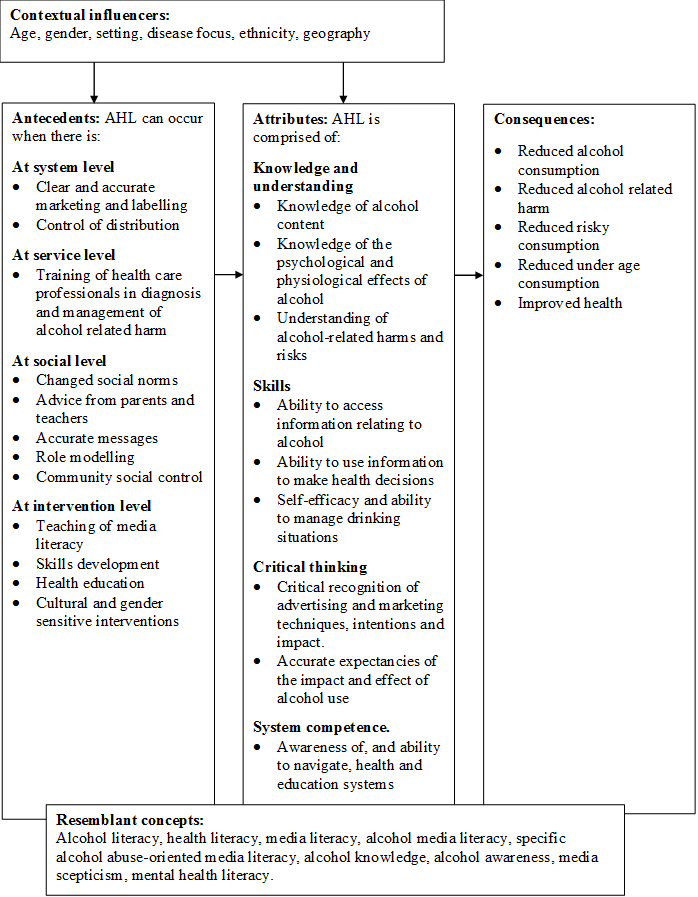
The 26 papers included in this review and which have undergone an Evolutionary Concept Analysis of alcohol health literacy are shown in Table 2. In this paper, we have adopted the term alcohol health literacy but the review shows that the term “alcohol literacy” is often used as a surrogate term (Pati et al., 2018; Rundle-Thiele, Simieniako, Kubacki & Deshpande, 2013; Fried & Dunn, 2012; De Benedittis, 2011) and resemblant terms adopted include “health literacy” (Anderson & Rehm, 2016; Barnard et al., 2014; Chisholm, Manganello, Kelleher & Marshal, 2014) and “media literacy” (Radanielina Hita, Kareklas & Pinkleton, 2018; Dumbili & Henderson, 2017; Gordon, Howard, Jones & Kervin, 2016; Chen, 2013).

The detailed concept analysis as shown in Figure 3 revealed a concept with many different attributes, the implications of which for practice interventions we go on to illustrate in Table 3. For many authors (Miller, 2018; Pati et al., 2018; Sinclair & Searle, 2016; Anderson & Rehm, 2016; Barnard et al., 2014; Chisholm et al., 2014; Rundle-Thiele et al., 2013), alcohol health literacy is the degree to which individuals have the capacity to obtain, process and understand knowledge about alcohol content, units, strengths and harms.

Table 2: Included studies in the review of alcohol health literacy

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No** | **Title** | **Attributes**  **(Characteristics, Definition)** | **Antecedents**  **(What needs to be in place to enhance alcohol health literacy?)** | **Consequences**  **(Outcomes of being alcohol literate)** | **Surrogate terms** | **Context notes** |
|  | | | | | | |
| 1. | Anderson and Rehm (2016) | Knowledge of alcohol content  Understanding of alcohol-related harms and risks  Ability to access information relating to alcohol  Ability to use information to make health decisions | Clear and accurate marketing and labelling  Changed social norms  Social marketing campaigns to educate the public and promote health literacy | Reduced alcohol consumption  Reduced alcohol related harm  Improved health | Health literacy and health literacy applied to alcohol | Alcohol industry, global market, Public policy, general population |
| 2 | Austin and Johnson (1997) | Critical recognition of advertising and marketing techniques, intentions and impact.  Accurate expectancies of the impact and effect of alcohol use | Teaching of media literacy  Advice from parents and teachers  Accurate messages  Cultural and gender sensitive interventions | Reduced risky consumption  Healthy alcohol behaviours | General media literacy  Specific alcohol media literacy  Specific alcohol abuse-oriented media literacy | Children, schools, education, USA |
| 3 | Austin et al. (2016) | Critical recognition of advertising and marketing techniques, intentions and impact | Teaching of media literacy  Skills development | Reduced alcohol related harm  Reduced risky consumption  Reduced under age consumption | Media literacy | Young adults (university students), psychology and personality traits, alcohol advertising, USA |
| 4 | Banerjee et al. (2013) | Critical recognition of advertising and marketing techniques, intentions and impact  Accurate expectancies of the impact and effect of alcohol use | Teaching of media literacy  Role modelling | Reduced risky consumption  Reduced under age consumption | Media literacy  Media-literacy-informed | Adolescents (14-17 yrs.) and college students (18-25 yrs.), evaluation of intervention, media education, USA |
| 5 | Banerjee et al. (2015) | Critical recognition of advertising and marketing techniques, intentions and impact  Ability to access information relating to alcohol  Ability to use information to make health decisions | Teaching of media literacy | Reduced risky consumption  Reduced under age consumption | Media literacy | High school students, schools, education, USA |
| 6 | Barnard et al. (2014) | Knowledge of alcohol content  Knowledge of the psychological and physiological effects of alcohol  Understanding of alcohol-related harms and risks |  | Reduced alcohol related harm  Reduced risky consumption  Improved health | Alcohol-specific health literacy  Alcohol related health literacy  Alcohol health literacy  Health literacy  Alcohol knowledge  Alcohol and carbohydrate knowledge  Functional health literacy  Carbohydrate content literacy | Young adults with Type 1 diabetes (18-30 yrs.), online survey, Health care/Diabetes centres, UK |
| 7 | Berey et al. (2017) | Critical recognition of advertising and marketing techniques, intentions and impact  Accurate expectancies of the impact and effect of alcohol use  Ability to access information relating to alcohol  Ability to use information to make health decisions | Teaching of media literacy  Accurate messages  Control of distribution | Reduced alcohol consumption  Reduced alcohol related harm  Reduced under age consumption | Media literacy applied to alcohol messages | Adolescents, literature review, psychology, different countries |
| 8 | Bohman et al. (2004 | Critical recognition of advertising and marketing techniques, intentions and impact | Skills development | Reduced alcohol consumption  Reduced under age consumption | Media literacy in context of alcohol prevention  Media literacy | Children (3rd-5th graders), elementary schools, education, USA |
| 9 | Canadian centre for substance use (2017) | Knowledge of alcohol content  Knowledge of the psychological and physiological effects of alcohol  Understanding of alcohol-related harms and risks | Community social control  Control of distribution  Health education | Reduced alcohol related harm  Reduced risky consumption | Alcohol literacy  Alcohol knowledge  Alcohol awareness | College students, university, alcohol education, policy, Canada |
| 10 | Chang et al. (2016) | Critical recognition of advertising and marketing techniques, intentions and impact | Teaching of media literacy  Cultural and gender sensitive interventions | Reduced alcohol consumption  Reduced risky consumption  Reduced under age consumption | Media literacy  Media literacy in alcohol context  Alcohol media literacy  Alcohol drinking media literacy  Media literacy capability | Adolescents (10th grade), schools, education, Taiwan |
| 11 | Chen (2013) | Critical recognition of advertising and marketing techniques, intentions and impact | Critical recognition of advertising and marketing techniques, intentions and impact  Cultural and gender sensitive interventions | Reduced alcohol consumption  Reduced alcohol related harm | Media literacy  Media literacy in context of alcohol  Health promotion media literacy  Media scepticism | Adolescents (7th to 10th graders), schools, intervention study, education, USA |
| 12 | Chisolm et al. (2014) | Accurate expectancies of the impact and effect of alcohol use  Ability to access information relating to alcohol  Ability to use information to make health decisions |  | Reduced alcohol consumption | Health literacy  Health literacy applied to alcohol  Literacy  Functional health literacy | Adolescents (14-19 yrs.), health care, education USA |
| 13 | Corrigan et al. (2018) | Knowledge of the psychological and physiological effects of alcohol  Understanding of alcohol-related harms and risks | Clear and accurate marketing and labelling  Health education  Cultural and gender sensitive interventions | Reduced alcohol related harm  Reduced risky consumption  Improved health | Health literacy  FASD health literacy  FASD literacy  Mental health literacy | Males/females (N=341), mothers (of FASD affected children), exploratory study, USA |
| 14 | DeBenedittis (2011) | Knowledge of the psychological and physiological effects of alcohol  Critical recognition of advertising and marketing techniques, intentions and impact  Accurate expectancies of the impact and effect of alcohol use | Teaching of media literacy  Accurate messages | Reduced alcohol related harm  Reduced risky consumption | Alcohol literacy  Media literacy  Media literacy applied to alcohol | Elementary, middle & high school, implementation manual of the Alcohol Literacy Challenge (ALC) programme, school setting, education, USA |
| 15 | Dumbili and Henderson (2017) | Critical recognition of advertising and marketing techniques, intentions and impact | Teaching of media literacy | Reduced risky consumption | Media literacy  Media literacy in alcohol context  Alcohol media literacy | Undergraduate students (N=31), university, exploratory study,  Nigeria |
| 16 | Fried and Dunn (2012) | Understanding of scientific information and facts about pharmacological effects of alcohol  Accurate alcohol expectancies  Contrasting scientific facts with information communicated in alcohol media advertisements | Teaching of media literacy and facts | Reduced alcohol use  Changed alcohol expectancy  Reduced alcohol related harm  Reduced binge drinking  Reformed alcohol drinking habits | Alcohol literacy  Media literacy in alcohol context | University fraternity members (N=250), intervention study using the Expectancy Challenge Alcohol Literacy Curriculum (ECALC), USA |
| 17 | Gordon et al. (2016) | Critical recognition of advertising and marketing techniques, intentions and impact  Accurate expectancies of the impact and effect of alcohol use  Self-efficacy and ability to manage drinking situations | Changed social norms  Teaching of media literacy  Community social control | Reduced alcohol consumption  Reduced under age consumption | Alcohol media literacy  Media literacy | Elementary schoolchildren (N=165), evaluation study of the Australian Alcohol Media Literacy (Austr. AL.) programme school setting, education, Australia |
| 18 | Hall et al. (2011) | Critical recognition of advertising and marketing techniques, intentions and impact | Teaching of media literacy  Health education | Reduced risky consumption  Reduced under age consumption | Media literacy  Media literacy in alcohol context | Schoolchildren (grades 9 to 12 (14-17 yrs.), school, education, USA |
| 19 | Kheokao et al. (2013) | Critical recognition of advertising and marketing techniques, intentions and impact | Clear and accurate marketing and labelling  Advice from parents and teachers  Health education | Reduced alcohol consumption  Reduced under age consumption | Media literacy  Media literacy in alcohol context  Literacy on alcohol use | Schoolchildren (4th-12th) and adults (vocational students), exploratory study, education, Thailand |
| 20 | Miller (2018) | Knowledge of the psychological and physiological effects of alcohol  Understanding of alcohol-related harms and risks | Health education |  | Alcohol health literacy | Adults/professionals/workforce, commercial training, education, USA |
| 21 | Pati et al. (2018) | Knowledge of alcohol content  Knowledge of the psychological and physiological effects of alcohol | Changed social norms  Advice from parents and teachers  Role modelling  Community social control  Health education  Cultural and gender sensitive interventions | Reduced under age consumption  Reduced alcohol related harm  Reduced alcohol consumption | Alcohol literacy  Literacy | Adults, exploratory study, India |
| 22 | Radanielina et al. (2018) | Critical recognition of advertising and marketing techniques, intentions and impact  Accurate expectancies of the impact and effect of alcohol use  Ability to use information to make health decisions | Teaching of media literacy  Advice from parents and teachers  Control of distribution  Changed social norms | Reduced alcohol related harm  Reduced risky consumption | Media literacy  Media literacy in alcohol context | Undergraduate university students (18-21 yrs.), exploratory study, Canada |
| 23 | Ratzan (2016) | Knowledge of the psychological and physiological effects of alcohol  Accurate expectancies of the impact and effect of alcohol use  Ability to access information relating to alcohol  Ability to use information to make health decisions  Self-efficacy and ability to manage drinking situations  System competence: awareness of, and ability to navigate, health and education systems | Social norms  Individual behaviour  Clear and accurate marketing and labelling  Changed social norms  Accurate messages  Skills development  Control of distribution  Health education | reduced harmful use of alcohol (including binge drinking, underage drinking and drink-driving)  Reduced alcohol consumption  Reduced alcohol related harm  Reduced risky consumption | Alcohol health literacy  Health literacy  Health literacy on the system level  Health literacy in alcohol context | General public, policy and practice around the world, education, USA |
| 24 | Rundle-Thiele et al. (2013) | Ability to access information relating to alcohol  Ability to use information to make health decisions | Clear and accurate marketing and labelling  Health education  Control of distribution  Changed social norms  Teaching of media literacy | Reduced alcohol consumption  Reduced alcohol related harm | Alcohol literacy  Health literacy (various domains, individual, system)  Alcohol knowledge  Literacy | Adults, exploratory study, respondents in Australia, Canada and Poland |
| 25 | Sinclair and Searle (2016) | Knowledge of alcohol content  Knowledge of the psychological and physiological effects of alcohol | Clear and accurate marketing and labelling  Control of distribution  Training of health care professionals in diagnosis and management of alcohol related harm | Reduced alcohol related harm  Improved health | Alcohol knowledge  Basic health literacy  Health literacy applied to alcohol  Health literacy | Adults (health professional), exploratory study, UK |
| 26 | Tamony et al. (2015) | Knowledge of alcohol content  Knowledge of the psychological and physiological effects of alcohol  Ability to access information relating to alcohol  Ability to use information to make health decisions  System competence: awareness of, and ability to navigate, health and education systems | Clear and accurate marketing and labelling  Health education  Advice from parents and teachers | Reduced alcohol related harm  Reduced under age consumption  Improved health | Alcohol health literacy | Diabetes context, review study, UK |

Figure 3: The concept of alcohol health literacy



Many of those who have studied alcohol health literacy have done so in the context of media literacy, and specifically in the broader framework of media education, where it is understood as applying critical thinking skills to alcohol marketing and media messages and developing the ability to identify alcohol messages, become aware of how those messages may influence behaviour, and deconstruct those messages with attention to the techniques used to attract attention (Radanielina Hita et al., 2018; Berey, Loparco, Leeman & Grube, 2017; Dumbili & Henderson, 2017; Gordon et al., 2016; Austin et al., 2016; Chang et al., 2016; Banerjee et al., 2013; Chen, 2013; Kheokao, Kirkgulthorn, Yingrengreung & Singhprapai, 2013; Fried & Dunn, 2012; Hall, Lindsay & West, 2011; Bohman et al., 2004). Common to the Australian media literacy programme (Gordon et al., 2016) and the US-based programme ALC (DeBenedittis, 2011), is the aim of demonstrating to young people how marketing is designed to produce positive beliefs about the benefits of drinking associated with sociability, independence, masculinity, and attractiveness. The Australian alcohol media literacy programme (Austr. AL.) aims to enable children and young people to resist advertising (Gordon et al., 2016), while the ALC is an elementary, middle and high school manual and curriculum designed to reduce young people’s attraction to alcohol and their expectancy of positive outcomes from drinking (DeBenedittis, 2011).

Other attributes identified as being central to alcohol health literacy include self-efficacy and an ability to manage drinking situations (Gordon et al., 2016; Ratzan, 2016), and using information to inform decision-making (Radanielina Hita et al., 2018; Anderson & Rehm, 2016; Ratzan, 2016; Rundle-Thiele et al., 2013). The ECALC (Fried & Dunn, 2012) is a programme that aims to change alcohol expectancy and challenge beliefs about the rewards of drinking. Also identified was a system competence including an awareness of, and ability to navigate, health and education systems (Ratzan, 2016; Tamony, Holt & Barnard, 2015).

Reflecting the emphasis on media literacy, the antecedents of alcohol health literacy are identified as teaching media literacy (e. g. Berey et al., 2017; Chang et al., 2016; DeBenedittis, 2011; Hall et al., 2011; Bannerjee et al., 2013; Austin & Johnson, 1997). Reflecting also the situating of alcohol health literacy as a property of the individual and especially important for young people, several studies identify the importance of parents and schools in providing advice (Radanielina Hita et al., 2018; Tamony et al., 2015; Kheokao et al., 2013), accurate messages and role modelling appropriate drinking behaviour (Berey et al., 2017; Banerjee et al., 2015; Austin & Johnson, 1997). Drinking is a social behaviour and studies identify the importance of changing social norms (Pati et al., 2018; Radanielina et al., 2018; Ratzan, 2016; Rundle-Thiele et al., 2013), community social control (Pati et al., 2018; Gordon et al., 2016) and developing skills required to manage social situations where there is alcohol involved (Austin et al., 2016; Ratzan, 2016; Bohman et al., 2004). Also identified is how marketing and labelling of alcohol content and guidelines can contribute to alcohol health literacy (Corrigan et al., 2018; Anderson & Rehm, 2016; Kheokao et al., 2013) as well as control of distribution (Radanielina et al., 2018; Pati et al., 2018; Berey et al., 2017; Ratzan, 2016).

The consequences of alcohol health literacy are conceptualised as reducing alcohol-related harms (e. g. Corrigan et al., 2018; Anderson & Rehm, 2016; DeBenedittis, 2011) and reducing levels of consumption (Pati et al., 2018; Gordon et al., 2016; Kheokao et al., 2013) particularly risky and underage consumption (Austin et al., 2016; Fried & Dunn, 2012; Ratzan, 2016; Bannerjee et al., 2013) through positive individual behaviours. Such consequences are associated with alcohol health literacy within almost all concepts identified as shown in Table 2.

The literature shows that the concept of alcohol health literacy is currently being discussed predominantly with reference to children and young people and primarily within educational settings (e. g. Austin et al., 2016; Chang et al., 2016; Gordon et al., 2016; DeBenedittis, 2011; Bohman et al., 2004). Those studies that discussed alcohol health literacy amongst the general or adult populations were less likely to reference media literacy as a component or media education as an intervention to increase alcohol health literacy (Corrigan et al., 2018; Miller, 2018; Rundle-Thiele et al., 2013). There is some variation in how the concept is discussed when it is used with particular population groups, such as young people with Type 1 diabetes, where the concept of alcohol health literacy is defined as the ability to understand the carbohydrate content of alcoholic drinks (Barnard et al., 2014). A recent study by Corrigan and colleagues (2018) refers to alcohol health literacy specifically in relation to Fetal Alcohol Spectrum Disorders (FASD) and the ability of individuals to understand the impact of FASD.

A key step in a concept analysis is the construction of an exemplar case which is a practical demonstration of the concept that is universal enough to clearly show the application of the concept (Rodgers, 2000). Table 3 shows the results of the theoretical mapping in this study in which the many domains of health literacy previously outlined in Table 1 were applied to alcohol. It is a “real-world” extraction of the concept of alcohol health literacy and offers a template for those designing alcohol education or alcohol health promotion.

Table 3: The exemplar case of alcohol health literacy

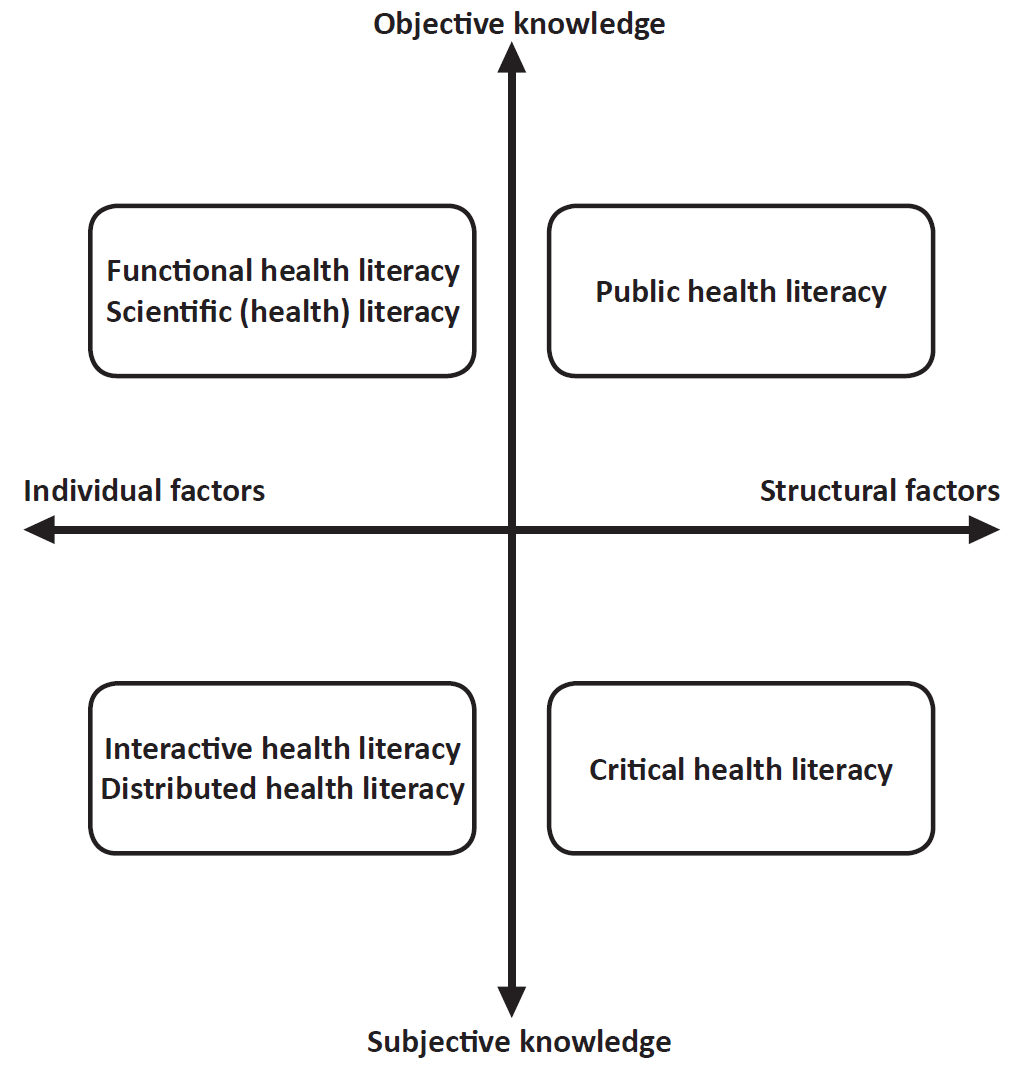
|  |  |
| --- | --- |
| Literacy domains | Example |
| Functional health literacy | * Gain information about alcohol and carbohydrate content of drinks * Knowledge of impact of alcohol on health * Be able to estimate personal consumption * Knowledge of alcohol strengths |
| Scientific health literacy | * Understanding the constituents of alcohol * Understanding the physiological, anatomical, biochemical processes by which alcohol affects the body * Understanding the scientific terms describing effect e.g. metabolism, half-life * Knowledge of blood-alcohol levels |
| Interactive health literacy | * Health Care Professionals (HCPs), teachers and public-facing staff able to raise the issue of drinking and assess readiness to change * Drinking behaviour and alcohol history as part of HCP assessments * Individuals being able to talk about alcohol use and navigate services |
| Distributed health literacy | * Accurate alcohol messages relayed by social networks * Accurate social media portrayals of drinking behavior * Individuals able to draw on information and skills held across the group to make decisions appropriate for the social situation |
| Critical health literacy | * Understand how drinking is influenced by marketing and subliminal messages * Be able to understand and take action to address the social determinants of drinking |
| Public health literacy | * Communities to control distribution * Pricing, labelling and marketing controlled to develop alcohol health literacy in populations |

**Discussion**

This concept analysis of alcohol health literacy reveals the fragmentation of the concept of health literacy when applied to a range of topics. The findings also indicate that when the health literacy concept is applied to alcohol, in addition to the skills of health literacy identified by Nutbeam (2000), newly introduced domains to the health literacy discourse, such as distributed health literacy (Edwards et al., 2015) and public health literacy (Freedman et al., 2009) should be considered when developing alcohol health literacy interventions.

The concept analysis reveals the importance of taking a relativist approach to using health literacy as a concept. The context in which the concept is used is critical, thus we see health literacy may be used differently in relation to alcohol than when used in relation to diabetes (Schillinger et al., 2002) or mental health (Kutcher, Wei & Coniglio, 2016; Jorm, 2015). In common with other domains of health literacy and reflecting a dominant individualist paradigm, alcohol health literacy currently emphasises the importance of understanding alcohol risks and harm and individuals drinking more safely. The concept analysis approach also, however, facilitates the identification of other important domains that are currently not being explored in health literacy. Figure 4 illustrates these different ‘pulls’ between the nature of the knowledge in health literacy, whether objective (scientific) or subjective (socially constructed) and the determinants of health literacy, whether individual or structural. These ‘pulls’ give rise to different domains of health literacy which are shown in the quadrants of Figure 4. Thus, alcohol knowledge can be objective (such as knowing the amount of alcohol in a standard drink and recommended daily / weekly intake to minimise risk), which in turn can be termed functional or scientific alcohol health literacy. It may also be subjective and the meanings that individuals construct themselves around alcohol use, such as expecting to feel more confident, as either individuals or within social groups or networks (which can be termed distributed alcohol health literacy), or it can be termed interactive alcohol health literacy, when individuals seek to navigate social, health or education systems. Alcohol health literacy can be individually held or socially determined by person-level factors, such as income or education, or by structural factors relating to licensing or availability, which can be termed public health literacy applied to the context of alcohol. Critical health literacy applied to alcohol is when individuals or communities identify and act upon those determinants that they identify as priorities based on their experiences.

Figure 4: The domains of alcohol health literacy



Applied to alcohol, the concept of health literacy has many attributes relating to critical thinking and the reading of alcohol messages. Many studies have sought to evaluate the effectiveness of media literacy programmes with young people and whether understanding the persuasive intent of alcohol advertising can prompt improved decision-making and behaviour change. Being alcohol health literate is however, a socially situated act that embraces empowerment and social and political action. Alcohol health literacy demands an understanding of the ways in which alcohol is promoted in society and the skills to take action at both the individual and the community level, which Freedman and colleagues (2009) describe as public health literacy and Zarcadoolas, Pleasant and Greer (2005) call civic literacy. Surprisingly, only one study that we identified looks at the industry (Anderson & Rehm, 2016) and its role in providing accurate labelling and another study highlights the importance of alcohol-related policy making and providing sustainable policy programs regulating alcohol manufacturing (Pati et al., 2018). An awareness of the complex forces that promote alcohol in society and how alcohol-related harms are socially distributed would also be part of public health literacy (Freedman et al., 2009). Numerous policy documents show that alcohol-related harms are socially patterned with those of lower socio-economic status and educational levels more likely to experience physical, mental and social harm from alcohol. Yet this review found no adoption of a determinants-based approach. Roche and colleagues (2015) call for a more nuanced approach to reducing alcohol-related harms by a better understanding of the complex and different ways that alcohol affects different communities and the social practice of alcohol health literacy.

An increasing focus of research in health literacy has been on what is termed interactive health literacy (see Table 1) – the interaction between an individual and systems, or other individuals, that may contribute to low health literacy. Several studies have identified the lack of awareness and skills of practitioners in relation to working with people with low health literacy (Coleman, Hudson & Maine, 2013) and also in diagnosing and assessing alcohol use (The Royal College of Psychiatrists, 2011; Beich, Thorsen & Rollnick, 2003; Kaner et al 2001). This review includes only two studies (Ratzan, 2016; Tamony et al., 2015) that draw attention to the skills needed to raise concerns about drinking behaviour with health and education professionals, one study that highlights the need to develop the competencies of health care and education professionals (Sinclair & Searle, 2016), and one in-house training programme that addresses the skills and knowledge of professionals who work with people who have alcohol issues (Miller, 2018). In their study, Barnard and colleagues (2014) specifically point to the importance of teaching alcohol health literacy to professionals to equip them with a skill-set that enables them to better interact with patients in context of their alcohol related-health problems. In health literacy research and practice, many have highlighted the importance of considering the health literacy of professionals in healthcare and community settings (Bruland et al., 2017; Kutcher et al., 2017; Parker & Ratzan, 2010; Baker, 2006; Peterson, Cooper & Laird, 2001) and that organisations and settings should be ‘health literate’ (Brach, 2017; Trezona, Dodson & Osborne, 2017; Brach et al., 2012) better enabling service users to interact with education, health and social systems leading to better education, therapy and health outcomes.

Drinking mostly takes place in a social context and relational aspects of health literacy are very important when drinking and amounts of alcohol are negotiated and navigated in everyday life, including online through social media (McCreanor et al., 2013). This broader concept of distributed health literacy (Edwards et al., 2015) and how health literacy is a shared resource drawing from individuals and across the community (Sentell, Pitt & Buchthal, 2017; Sentell, Zhang, Davis, Baker & Braun, 2014) was not very evident in this review on alcohol health literacy. Addressing distributed alcohol health literacy and the roles performed by health mediators in communities, whether family, peers, media or the internet, social media is key to understanding and promoting alcohol health literacy.

The strength of applying the concept analysis method within a defined topic (in this case alcohol) is enabling a new look at the wider concept of health literacy and revealing the dominant domains. In the case described here, we identified domains of functional and scientific health literacy in building knowledge and skills around understanding risks and critical cognitive skills around reading media messages. Individuals need not only the skills and competencies to access, understand, appraise, and apply alcohol information but also a supportive environment that facilitates the acquisition of those skills and the building of interactive health literacy. Far less evident were public health literacy and distributed health literacy domains. Building distributed health literacy in relation to alcohol means the delivery of programmes in different settings including families, education settings and workplaces and across the life-course that develop interpersonal skills that enable individuals to draw on the information and skills in their social networks. Building public health literacy would involve public and policy discourses about the risks and benefits of system-wide approaches to alcohol (e. g. balancing tax revenues with the health and social costs of alcohol).

Whilst this analysis has been conducted systematically according to Systematic Review principles of comprehensiveness, transparency and replicability (Higgins & Green, 2011) and is able to help delineate conceptual boundaries and the operationalisation of alcohol health literacy, it has not included an appraisal of the literature selected and does not comment on the maturity of the concept as described. There may be other studies whose focus is on developing alcohol health literacy which are not included in this review as our choice of resemblant terms was limited following our interest in the application of the concept of health literacy. This is not therefore, a comprehensive review of the alcohol health promotion field.

**Conclusion**

Exploring the concept of alcohol health literacy through a rigorous and transparent methodology has shown how, when the health literacy concept is applied to issues such as alcohol, it is done so in a narrow sense whilst other broader domains such as distributed or public health literacy are omitted. The exemplar case developed from this rigorous Evolutionary Concept Analysis provided in Table 3 shows the potential for a broad and integrated approach to alcohol health promotion. Whilst the reduction of alcohol use is a public health priority and unusually the 2015 German Prevention Law (Deutscher Bundestag, 2015) specifically refers to health literacy skills, this is only in a narrow sense of avoidance of risk. Health literacy when applied, as here to alcohol, needs a definition that draws attention to health literacy being created and distributed within social groups and systems, whether organisational, educational or healthcare. The health literacy of the public and civic society also needs to be developed. We therefore propose a broader definition with the additions highlighted: “Health literacy is the motivation, knowledge and competencies *of individuals, social groups, and the public, within systems and social settings* to access, understand, appraise and apply health information in order to make judgments and take *action* in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life throughout the course of life.”

Where health literacy is applied to a context, e. g. in relation to a disease or a population group, the concept analysis shown in Figure 3 provides an important framework for developing interventions. It focuses on what needs to be in place to develop health literacy at different levels (the antecedents), what does an individual need to possess to be health literate in that context (the attributes) and what would be the outcomes of being health literate (the consequences). The analysis also reveals the importance of building both individual skills and addressing the structural conditions that give rise to health behaviours at the same time.

The innovative methodology adopted here of blending concept analysis with systematic review principles has enabled a theoretical mapping which clearly shows the importance of clarifying the contextual application of the concept of health literacy to different topics or population groups. In so doing, it may prompt a broader health literacy approach leading to more effective, alcohol health promotion interventions.

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