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Drinking and mental health in middle adulthood: exploring the impact of wellbeing, mental health literacy, and drinking motives on risk of alcohol dependence

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ABSTRACT

Objectives: Risky drinking is a concern among UK-based middle-aged adults. We aimed to explore the relationship between risky drinking, drinking motives, wellbeing, and mental health literacy (MHL).

Method: Cross-sectional analysis of online survey data completed by 193 UK-based adults aged 40–65 who drank alcohol, incorporating the Alcohol Use Disorders Identification Test (AUDIT); Drinking Motives Questionnaire-Revised (DMQ-R); Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS); Mental Health Literacy Scale (MHLS) and demographic questions.

Results: Coping, enhancement and conformity motives and gender significantly predicted higher AUDIT scores (measuring risky drinking). Enhancement motives were found to mediate the relationship between the self-help component of MHL and AUDIT scores, while coping motives mediated the association between wellbeing and AUDIT scores.

Conclusion: Findings support research emphasising the influence of drinking motives on risky drinking and highlights how low wellbeing may interact with coping motives to explain risky drinking among middle-aged adults, particularly men. Interventions supporting individuals to understand the relationship between drinking motives and risky drinking, develop adaptive coping strategies, and address the causes of low wellbeing, may be beneficial. However, as the sample was 84% ethnically White, 64% women, 85% educated to at least undergraduate level, and reported a relatively high mean socioeconomic status (6.98 out of 10), the results may not generalise beyond these groups. Future research should use stratified sampling to increase generalisability, as well as exploring whether alcohol-specific, component-specific, or disorder-specific MHL is associated with risky drinking and wellbeing.

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Alcohol; middle-aged; mental health literacy; risky drinking; drinking motives; wellbeing

Introduction


Alcohol, despite its sociocultural importance across the world, remains a psychotropic and toxic substance liable to misuse (World Health Organization (WHO), 2019). In the UK, 8,974 deaths from alcohol-specific causes were recorded in 2020, an 18.6% increase from 2019 (Office for National Statistics (ONS), 2021). Whilst UK government guidance advises adults to avoid regularly drinking more than 14 units a week (National Health Service (NHS), 2021), over 10 million people in England reported drinking at these levels in 2019 (Bankiewicz & Robinson, 2020).

Risky drinking is defined here as consuming alcohol at a level of increasing (or higher) risk of dependence or harm to the drinker or others (Babor et al., 2001), contributing to accidents and the development or exacerbation of numerous health issues (WHO, 2018a). Researchers have linked increased risky drinking with mental health difficulties, including symptoms of depression (Churchill & Farrell, 2017) and anxiety (Kushner et al., 1990). Studies have also suggested that increased risky drinking is associated with lower wellbeing (Appleton et al., 2018; Jones et al., 2013). Here, wellbeing is defined as holding positive mental and emotional states facilitating effective functioning in life (WHO, 2018b). Evidence indicates that risky drinking and poor

mental health may be bi-directionally related (Bell & Britton, 2014), suggesting that reducing risky drinking may improve mental health and vice versa. A deeper understanding of risky drinking, mental wellbeing, and their respective predictors, may therefore inform interventions targeting risky drinking.

In particular, there is a need for interventions tailored to middle-aged individuals. Of the UK alcohol-specific deaths recorded in 2020, 69.5% were aged 45–69 (ONS, 2021), while adults aged 55–64 were the group in England most likely to drink above recommended limits in 2019 (NHS, 2021). Studies also suggest that UK individuals in their 40s and 50s experience lower wellbeing than other age groups (Gondek et al., 2021; Jones et al., 2013). This may be related to the increased likelihood of factors associated with increased stress and lower wellbeing during middle adulthood, including divorce and caregiving for children and/or aging family (Blanchflower & Graham, 2022; ONS 2020a; 2020b). The associations found between risky drinking and low wellbeing, along with the increased prevalence of both variables among middle-aged adults, indicates that research examining drinking and wellbeing is vital in this age group. In spite of this, there remains comparatively less research on mid-life drinking compared to drinking in younger age groups (Davies et al., 2021).

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Drinking motives are often employed as predictors of drinking behaviour (Cooper et al., 2015; Crutzen et al., 2013). Cox and Klinger (1988) proposed that individuals drink to regulate their emotions. Cooper (1994) proposed four primary motives, subdivided by source and valence: Conformity (external avoidance), Coping (internal avoidance), Enhancement (internal approach), and Social (external approach). Social or Enhancement motives are usually the most endorsed, followed by Coping, then Conformity motives (Mackinnon et al., 2017).

Notably, drinking motives studies have focused on younger samples (Bresin & Mekawi, 2021), while the few studies looking at middle-aged and older adults have reported conflicting results (Moran & Saliba, 2012; van Gils et al., 2021). Research across age groups has found robust positive associations between risky drinking and each core motive, with Coping motives being the most consistent direct and indirect predictor of risky drinking, especially when controlling for consumption volume (Bresin & Mekawi, 2021; O'Hare & Shen, 2012). This may be because drinking to cope assumes the avoidance of a stressor (Bresin & Mekawi, 2021), which may itself increase stress (Holahan et al., 2005), thus provoking more problematic patterns of drinking. This could explain findings which suggest that individuals with poor mental health often endorse avoidant drinking motives (Appleton et al., 2018). Evidence also indicates that Coping and Enhancement motives mediate the link between poor mental health and risky drinking (Goldsmith et al., 2009; Holahan et al., 2003). Drinking motives may thus also mediate the relationship between risky drinking and variables related to mental wellbeing, such as mental health literacy (MHL).

Jorm et al. (1997) defined MHL as the knowledge and beliefs about mental disorders which facilitates their recognition, management, and prevention, including the ability to recognise disorders (Disorder Recognition); knowledge and beliefs about risk factors and causes (Risk Factors & Causes), self-help strategies (Self-Help), professional help (Professional Help) and sources of information (Information-Seeking); and attitudes facilitating disorder recognition or help-seeking (Attitudes). Evidence suggests that MHL can positively predict mental health outcomes (Kutcher et al., 2016; Spiker & Hammer, 2019). However, MHL lacks an agreed-upon measure (O'Connor et al., 2014; Spiker & Hammer, 2019). Disorder Recognition vignettes generate inconsistent results (Furnham & Hamid, 2014) and remain non-psychometric (Kutcher et al., 2016). More recently, O'Connor & Casey (2015) developed the mental health literacy scale (MHLS) to psychometrically measure each component of Jorm et al. (1997)'s model. This has been validated in Australian adults (O'Connor & Casey, 2015), UK undergraduate students (Gorczyński et al., 2017; Marwood & Hearn, 2019) and UK sports coaches (Gorczyński et al., 2020). However, the diversity of MHL components raises questions about the usefulness of studying MHL as a single variable. While most MHLS studies focus on its overall score, it may be beneficial to differentiate between the subscales.

There are some indications that MHL may be related to Coping motives and risky drinking. In a sample of young Australians, Wright et al. (2007) found that recognition of depressive symptoms was negatively associated with endorsing smoking marijuana to relax. While marijuana-smoking motives may differ from drinking motives, this suggests that the propensity to consume substances to relax may differ depending on MHL. Similar inferences can be made from De Carvalho and

Vale-Dias (2021)'s study, which found a weak, negative correlation between MHL and substance use as coping in Portuguese adolescents. These results may not generalise to middle-aged UK-based adults, but they raise interesting questions.

As far as the authors are aware, no other studies have yet examined the interrelationships between MHL, wellbeing, drinking motives and risky drinking, and there is a paucity of research focusing on mental health, MHL and drinking in middle adulthood. This exploratory research will attempt to address this gap. Specifically, this study aims to examine:

1. the patterns of risky drinking, as measured by AUDIT, drinking motives, MHL, and wellbeing,
2. the relationships between risky drinking, drinking motives, MHL, and wellbeing and identify significant predictors of AUDIT scores, and
3. whether drinking motives mediate the relationships between risky drinking and MHL and wellbeing, respectively.

Methods

Participants and procedure

Inclusion criteria were that participants be aged 40–65, UK-based and drink alcohol. Recruitment via noticeboard posters, social media and email was conducted from 19 March 2022 to 17 May 2022, including email contact with several community-based over 50s forums. Of the 276 initially recruited participants, 81 were removed from the sample because of incomplete questionnaire participation, and 2 who selected 'Prefer not to say' for gender were removed, to facilitate the inclusion of gender in the regression analysis. The final sample included 193 participants with a mean age of 51.54 ($SD=6.80$; 65% women, 35% men).

Design and measures

This study employed an online, cross-sectional survey using Qualtrics software, which took around 15 min to complete. Procedures were approved by the Department of Psychology Research Ethics Committee at Oxford Brookes University. The participant information sheet and survey are included in [Supplemental Material](#).

Risky drinking: The ten-item Alcohol Use Disorders Identification Test (AUDIT) is a widely used standardised screening tool to identify risky drinking, comprising three domains: frequency and quantity of drinking; symptoms of dependence; and consequences of alcohol consumption. The composite AUDIT score identifies overall risk of alcohol dependence (Babor et al., 2001). Questions were scored from 0 to 4. A composite score was generated, with scores divided into low risk (0–7); increasing risk (8–15); higher risk (16–19); and possible dependence (≥ 20). Domain scores were not generated for the purpose of this analysis. For questions 1, 3–8, the scale items 'Never/Monthly or less' (0); '2 to 4 times per month' (1); '2 to 3 times per week' (2); and '4 times or more per week' (3) were used. For question 2, measuring units of alcohol consumed, the scale items '0 to 2' (0); '3 to 4' (1); '5 to 6' (2); '7 to 9' (3) and '10 or more' (4) were used. Questions 9–10 focused on alcohol-related consequences, using scale items of 'No' (0), 'Yes, but not in the last year' (2) and

'Yes, during the last year' (4). Internal reliability in this sample was good ($\alpha = 0.84$).

Drinking motives were measured using the 20-item Drinking Motives Questionnaire-Revised (DMQ-R) (Cooper, 1994), which has been validated across European gender and age groups (Crutzen et al., 2013; Fernandes-Jesus et al., 2016). It comprises 4 five-item subscales: Conformity, Coping, Enhancement, and Social. Participants were asked to indicate their drinking frequency for each motive (for example, 'To relax') on a scale from 1 (Almost Never/Never) to 5 (Almost Always/Always). Subscale scores were generated, ranging from 5 (indicating no endorsement of a drinking motive) to 25 (indicating full endorsement of a drinking motive). Internal reliability for each subscale was good in this sample ($\alpha = 0.82$ – 0.87).

MHL was measured using the MHLS (O'Connor & Casey, 2015), comprised of six subscales: Disorder Recognition (eight items); Risk Factors & Causes (two items); Self-Help (two items); Professional Help (three items); Information-Seeking (four items); and Attitudes (15 items, in this study) (see Supplemental Material for the scales for each item). Questions were scored from 1–4 or 1–5 and questions 10, 12, 15, and 20–28 were reverse scored. Composite and subscale scores were generated. Question 27 of the Attitudes subscale (measuring agreement with the statement, 'If I had a mental illness, I would not seek help from a mental health professional') was excluded from the survey. The maximum composite score was therefore 155 (originally 160). For this study, several replacements were made following suggestions from Matt O'Connor, co-author of the MHLS: 'UK' replaced 'Australia' (questions 9–10), 'Persistent Depressive Disorder (Dysthymia)' replaced 'Dysthymia' (question 5), and 'Substance Abuse Disorder' replaced 'Drug Dependence' (question 8) to reflect current terminology in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Internal reliability for the overall MHLS ($\alpha = 0.85$) and the Disorder Recognition, Attitudes, and Information-Seeking subscales ($\alpha = 0.66$ – 0.79) were acceptable, but suboptimal for Professional Help ($\alpha = 0.31$). As Cronbach's alpha is inappropriate for two-item subscales (Eisinga et al., 2012), reliability statistics were not calculated for the Risk Factors & Causes and Self-Help subscales. All subscales were retained in analyses, but results were treated cautiously.

Wellbeing during the previous two weeks was measured using the 14-item Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) (Tennant et al., 2007). Participants were asked to

indicate how well each statement described their experience (for example, 'I've been thinking clearly') on a scale of 1 (None of the time) to 5 (All of the time), with composite scores ranging 14–70. Sub-scores were also generated based on a UK population mean of 51: low (14–42), medium (43–59), and high (60–70) wellbeing (Tennant et al., 2007). Internal reliability in this sample was excellent ($\alpha = 0.94$).

Demographic information was also measured for descriptive and control purposes. Evidence indicates that each demographic variable collected is associated with alcohol: age (NHS, 2021), gender (Bankiewicz & Robinson, 2020), ethnicity, education level, and socioeconomic status (Sassi, 2015). Please see Table 1 and Supplemental Material respectively for summary and full details of the categories provided for each variable.

Randomisation of measures and questions within measures were employed to reduce order effects.

Results

Statistical methods

The data were analysed using Jamovi version 2.3.28.0. Q-Q plots indicated that the data for each variable was not normally distributed. Accordingly, non-parametric tests were employed where appropriate. An alpha level of 0.05 was used for all analyses.

Descriptive statistics

The distribution of demographic and wellbeing variables (Table 1) and main study variables (Table 2) was examined. Participants predominantly identified as ethnically White (85%), educated to an undergraduate level or above (85%) and having relatively high socioeconomic status ($M = 6.98$, $SD = 1.43$), where 1 represented the 'worst off' and 10 represented the 'best off' relative to other UK-based individuals. Participants primarily reported medium levels of wellbeing in the two weeks before study participation (64%), with mean wellbeing ($M = 49.33$, $SD = 9.79$) falling in this bracket (Table 1).

Aim 1. To examine the patterns of risky drinking, drinking motives, MHL and wellbeing of UK-based, middle-aged adults.

Table 2 outlines the key patterns identified for the main study variables. Of the 60% of participants reporting scores indicating low risk of alcohol dependence, 9 participants reported an AUDIT score of 0. These responses were retained in the analysis,

Table 1. Descriptive statistics for demographic and wellbeing variables in this study sample.

Variable	Mean (SD)	% (N)
Age	51.54 (6.80)	–
Gender		
Women	–	65% (125)
Men	–	35% (68)
Ethnicity		
Any White backgrounds	–	85% (164)
All other ethnic backgrounds	–	14% (28)
Prefer not to say	–	1% (1)
Education level		
Undergraduate level or above	–	85% (165)
Below undergraduate level	–	15% (28)
Socioeconomic status (on a scale of 1 ('worst off') to 10 ('best off') relative to other UK-based individuals)	6.98 (1.43)	–
Wellbeing	49.33 (9.79)	–
Low wellbeing (14–42)	–	23% (45)
Medium wellbeing (43–59)	–	64% (123)
High wellbeing (60–70)	–	13% (25)

Table 2. Scale characteristics of the main study variables.

Scales	Range	Mean (SD)	% (N)
AUDIT	0–35	7.56 (6.02)	–
Low risk (0–7)	–	–	60% (115)
Increasing risk (8–15)	–	–	28% (55)
Higher risk (16–19)	–	–	9% (17)
Possible dependence (≥ 20)	–	–	3% (6)
DMQ-R			
Conformity	5–25	7.14 (2.98)	–
Coping	5–25	9.74 (4.52)	–
Enhancement	5–25	12.72 (4.77)	–
Social	5–25	14.34 (5.12)	–
MHLS	89–148	125.50 (11.56)	–
Disorder recognition	17–32	25.25 (2.79)	–
Information-seeking	10–20	16.08 (2.78)	–
Risk factors & causes	2–8	5.02 (1.09)	–
Self-help	3–8	6.16 (1.05)	–
Professional help	7–12	10.36 (1.41)	–
Attitudes	37–75	62.64 (8.70)	–

as the participant information sheet made clear that participants should be alcohol drinkers. A Mann-Whitney U test indicated that men had significantly higher mean AUDIT scores ($M=8.84$, $SD=6.05$) than women ($M=6.90$, $SD=5.92$) ($U=3,315$, $N=193$, $p=0.011$, $d=0.22$). Furthermore, for the MHLS Disorder Recognition subscale, the most correctly recognised symptoms (answered 'Very Likely') were for Bipolar Disorder (62%), while symptoms of Major Depressive Disorder (7%) were the least correctly recognised.

Inferential statistics

Aim 2. To examine the relationships between risky drinking, drinking motives, MHL, and wellbeing, and identify significant predictors of risky drinking, for UK-based, middle-aged adults.

Spearman correlations were computed for the main study variables (including MHLS composite and subscale scores) and the control variables (age, socioeconomic status, and education) (Table 3). Categorical variables (ethnicity and gender) were excluded.

AUDIT scores significantly positively correlated with all four drinking motives (the strongest being Coping motives ($\rho=0.58$, $p<0.001$)). AUDIT scores also significantly negatively correlated with Wellbeing ($\rho=-0.24$, $p<0.001$) and Education level ($\rho=-0.18$, $p=0.015$). Significant positive correlations were also found between Enhancement motives and both the MHLS Self-Help subscale ($\rho=0.18$, $p=0.012$) and the MHLS composite ($\rho=0.15$, $p=0.034$) scores. All drinking motives also significantly moderately to strongly correlated with each other. Lastly, Wellbeing scores significantly negatively correlated with Coping motives ($\rho=-0.38$, $p<0.001$) and positively correlated with the MHLS Information-Seeking subscale ($\rho=0.19$, $p=0.01$).

Parametric assumptions were tested in advance of a multivariate regression, with no significant violations noted.

AUDIT scores were entered as the outcome variable. The main study and control variables found to significantly correlate with AUDIT scores (Table 3) were entered as predictor variables. This included the four drinking motives, Wellbeing scores and Education level. Given the results of the Mann-Whitney U test detailed above, gender (Man/Woman) was also included as a predictor variable, with Woman as the reference variable. The regression statistics are detailed in Table 4. The model was statistically significant ($F(7,185)=16.56$, $p<0.001$) and the predictor variables accounted for 36% of the variation in AUDIT scores ($R^2_{adj}=0.36$). Coping ($\beta=0.38$, $p<0.001$), Enhancement ($\beta=0.19$, $p=0.035$) and Conformity ($\beta=0.16$, $p=0.017$) motives, as well as Gender ($\beta=0.25$, $p=0.043$), were found to significantly predict AUDIT scores.

Table 4. Summary of multivariate regression analysis for variables predicting AUDIT scores.

Variable	B	SE (B)	t	β	R	R ²	R ² _{adj}
–	–	–	–	–	.62	.39	.36
DMQ-R Conformity	.35	.14	2.56*	.17	–	–	–
DMQ-R Coping	.51	.11	4.59***	.38	–	–	–
DMQ-R Enhancement	.27	.11	2.43*	.22	–	–	–
DMQ-R Social	–.16	.10	–1.57	–.14	–	–	–
Wellbeing	–.05	.04	–1.21	–.08	–	–	–
Education	–.67	.35	–1.94	–.11	–	–	–
Gender: Man	1.50	.74	2.04*	.25	–	–	–
– Woman							
Reference Level: Woman							

Note. Bold indicates statistical significance; * $p<0.05$, *** $p<0.001$.

Aim 3. To examine whether drinking motives mediate the relationships between risky drinking and MHL and wellbeing, respectively, for UK-based, middle-aged adults.

Table 3. Spearman's correlations (two-tailed) of all variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. AUDIT (composite)	–															
2. DMQ-R – Conformity	.23**	–														
3. DMQ-R – Coping	.58***	.35***	–													
4. DMQ-R – Enhancement	.51***	.35***	.61***	–												
5. DMQ-R – Social	.35***	.49***	.57***	.72***	–											
6. MHLS (composite)	.09	–0.12	–0.01	.15*	.04	–										
7. MHLS – Disorder Recognition	.02	.06	.10	.06	.02	.38***	–									
8. MHLS – Information-Seeking	–0.04	–0.11	.02	.10	.13	.45***	.17*	–								
9. MHLS – Risk Factors & Causes	.08	–0.00	.03	.08	.00	.33***	–0.00	.12	–							
10. MHLS – Self-Help	.09	.04	.00	.18*	.09	.37***	.09	.02	.11	–						
11. MHLS – Professional Help	.00	.00	.01	.12	.07	.48***	.23**	.22**	.24***	.42***	–					
12. MHLS – Attitudes	.13	–0.13	–0.04	.10	–0.02	.89***	.12	.18*	.22**	.25***	.25***	–				
13. Wellbeing	–0.24***	–0.08	–0.38***	–0.13	–0.09	–0.08	–0.03	.19**	–0.05	–0.05	–0.09	–0.12	–			
14. Age	.00	.01	–0.00	–0.00	.02	–0.12	–0.03	–0.03	.01	–0.12	–0.07	–0.11	.13	–		
15. Socioeconomic status	–0.02	–0.01	–0.13	–0.07	–0.13	.06	–0.05	–0.07	.04	.08	–0.03	.09	.16*	.08	–	
16. Education	–0.18*	.01	–0.16*	–0.14*	–0.17*	.01	.01	.03	.07	–0.01	.04	–0.02	.07	–0.11	.25***	–

Note. Bold indicates statistical significance; * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

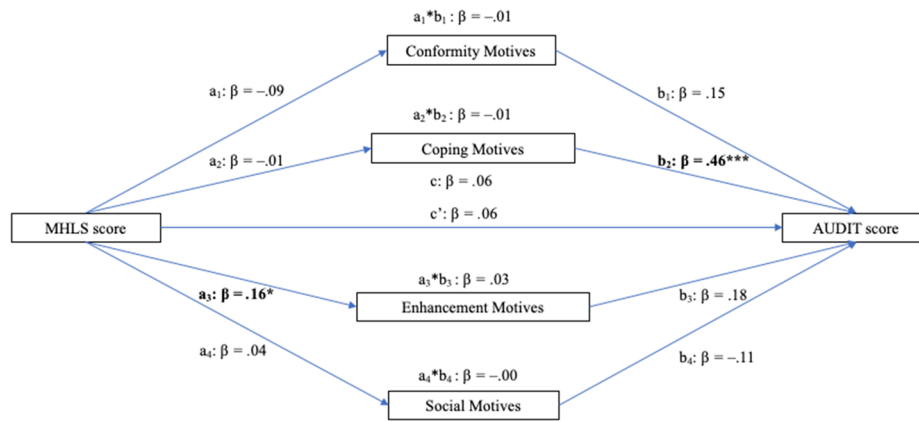


Figure 1. Standardised regression coefficients for the relationship between composite MHLS and AUDIT scores as mediated by drinking motives.

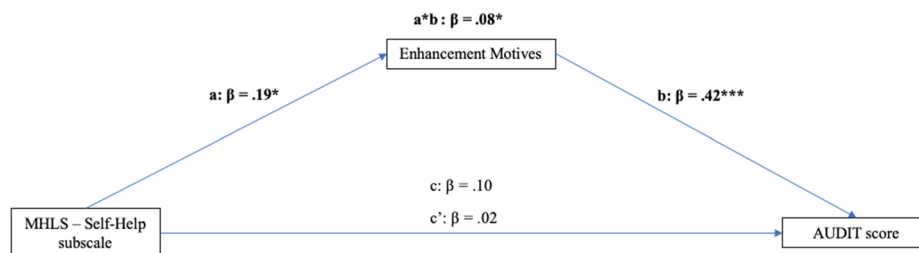


Figure 2. Standardised regression coefficients for the relationship between the MHLS Self-Help subscale and AUDIT scores as mediated by Enhancement motives.

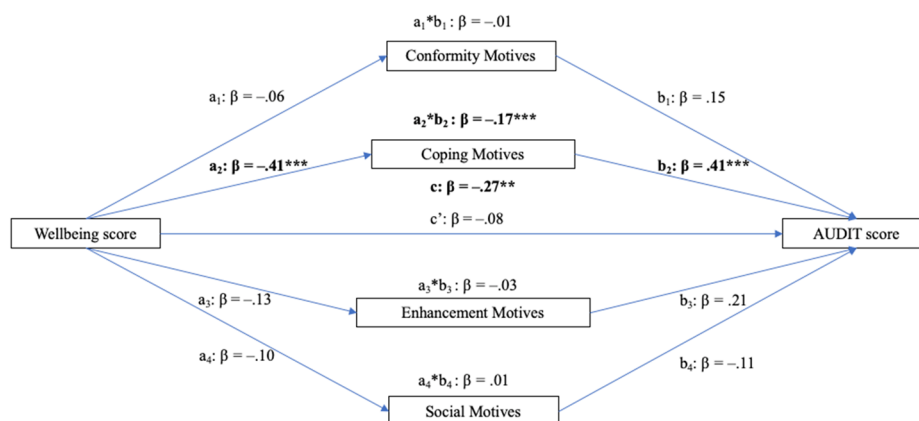


Figure 3. Standardised regression coefficients for the relationship between composite wellbeing and AUDIT scores as mediated by drinking motives.

Note (for all Figures). Bold indicates statistical significance; * $p < .05$, ** $p < .01$, *** $p < .001$; a = effect of predictor variable on mediator variable; b = effect of mediator variable on outcome variable; a^*b = indirect effect of predictor variable on outcome variable through mediator variable; c = total effect of predictor variable on outcome variable, including effect of mediators; c' = direct effect of predictor variable on outcome variable, excluding effect of mediators.

Three mediation analyses were conducted using the GLM Mediation Analysis package in Jamovi, using 1000 bootstrapped samples.

In the first analysis, the data were analysed to explore whether the relationship between the composite MHLS score and AUDIT score was mediated by the four drinking motives. The analysis found no significant indirect or direct effects of MHLS on AUDIT scores ($p \geq 0.266$), indicating no mediation (Figure 1).

The second analysis explored whether the relationship between MHLS Self-Help subscale scores (which significantly correlated with Enhancement motives) and AUDIT scores was mediated by Enhancement motives. The analysis found a significant indirect effect of Self-Help subscale scores on AUDIT scores ($\beta = 0.08$, $p = 0.030$), suggesting mediation by Enhancement motives (Figure 2).

The third analysis examined whether the relationship between the composite Wellbeing score and AUDIT score was

mediated by drinking motives. A significant indirect effect of Wellbeing scores on AUDIT scores through Coping Motives was found, indicating mediation ($\beta = -0.17$, $p < 0.001$). The total effect of Wellbeing scores on AUDIT scores (including the effect of Coping Motives) was also significant ($\beta = -0.27$, $p = 0.003$) (Figure 3).

Discussion

The first aim of this study was to contribute to the research on wellbeing, MHL, drinking motives and risky drinking in a middle-aged, UK-based population. While the majority of participants reported drinking at low risk levels, 41% reported drinking at or above levels indicating increasing risk of alcohol dependence, despite the female skew of the sample and the finding that women reported significantly lower levels of risky drinking than men in the sample. A recent UK study with a slightly older

(aged 55–74), male-skewed sample reported the same proportion (41%) of participants drinking at these levels (Rao et al., 2022). This is markedly higher than the 28% of drinkers (aged 18–85) reporting drinking at or above increasing risk of dependence in a recent UK population survey (Pearson & Slater, 2021). These results align with findings indicating that middle-aged individuals drink at levels indicating a higher risk of dependence, when compared with other age groups (NHS, 2021).

Participants most strongly endorsed Social drinking motives, followed by Enhancement, Coping and Conformity motives, in line with drinking motives research across age groups (Bresin & Mekawi, 2021; Moran & Saliba, 2012). Mean participant wellbeing was also similar to previously found England-specific (Morris & Earl, 2017) and UK-wide (Tennant et al., 2007) population means. These results suggest that middle-aged adults endorse similar drinking motives and experience similar wellbeing levels as the general population.

Additionally, the mean MHLS score (125.5 out of 155) was quite high and comparable to mean scores reported by Australian adults (127.98) (White & Casey, 2017) and UK undergraduates (122.88–127.69) (Gorczyński et al., 2017; Marwood & Hearn, 2019), despite these studies using the full MHLS (out of 160). Interestingly, participants exhibited their highest MHL regarding knowledge about professional help (namely, cognitive behavioural therapy and the confidentiality obligations of mental health professionals). Conversely, they demonstrated their lowest MHL on knowledge and beliefs about risk factors and causes (focused on gender and mental health). Participants were also best at recognising Bipolar Disorder and worst at recognising Major Depressive Disorder (MDD), which was surprising given the comparatively high prevalence of depression (McManus et al., 2016). Possibly, this was due to unfamiliarity with the MDD diagnostic label or with symptomology besides low mood. Interventions to increase MHL among UK-based middle-aged adults may therefore benefit from focusing on mental health risk factors and causes (gender-associated and otherwise) and diagnostic labels and criteria for common conditions like MDD.

The second aim of this study was to examine the relationships between risky drinking, drinking motives, MHL, and wellbeing, and identify significant predictors of risky drinking in this sample. Coping motives, gender, Enhancement and Conformity motives (in reducing effect size) positively predicted risky drinking as measured by AUDIT scores. The predictive effect of gender, suggesting that levels of risky drinking were higher for men, was found despite this sample comprising nearly double the number of women than men. This aligns with previous research highlighting the prevalence of risky drinking among men (Bankiewicz & Robinson, 2020). The regression findings also support research suggesting that Coping motives and risky drinking were related in a slightly older (60 and over) Australian sample (Gilson et al., 2017), as well as meta-analyses indicating that Coping motives are associated with the most maladaptive drinking patterns (Bresin & Mekawi, 2021; Cooper et al., 2015).

Notably, no significant correlation between overall MHL and AUDIT scores was found. This may be because overall MHL and wellbeing (which did significantly correlate with AUDIT scores) were not significantly related in this sample. Previous studies have linked increased MHL with higher wellbeing in younger populations, however, these used depression-specific vignettes (Lam, 2014) or unvalidated non-MHLS questionnaires (Kurki et al., 2021). Other UK studies using the MHLS and WEMWBS

also failed to find a significant relationship between the two variables in younger samples (Gorczyński et al., 2017; Oftadeh-Moghadam & Gorczyński, 2022).

This study also found a significant negative correlation between wellbeing and AUDIT scores. Although this association was weak, it supports prior research suggesting that individuals with low wellbeing are more likely to drink at levels indicating a higher risk of dependence (Appleton et al., 2018; Parackal & Parackal, 2017). However, when wellbeing scores, education level and gender were added to the regression, only gender and the four drinking motives were identified as significant predictors of risky drinking. This is consistent with Cooper et al. (2015)'s predictions that drinking motives are the 'final common pathway' to alcohol use outcomes, including risk of dependence. Nevertheless, the amount of variance explained by the regression model was moderate.

The third aim of this study was to examine whether drinking motives mediate the relationship between AUDIT scores and MHL and wellbeing, respectively. The results of the first mediation analysis suggested that overall MHL and risky drinking were neither directly nor indirectly associated through drinking motives. The results did, however, suggest that MHL positively predicted Enhancement motives (albeit weakly). This mirrored the positive correlation found between these two variables, which appeared to result from the correlation between Enhancement motives and the MHLS Self-Help subscale. Accordingly, the second mediation analysis examined whether Enhancement motives mediated the relationship between Self-Help subscale scores and risky drinking. Enhancement motives very weakly mediated this association, suggesting that participants with improved knowledge of self-help strategies may be marginally more likely to drink to enhance their mood, and thus more likely to drink at higher risk levels. It is unclear how this would be explained. This finding may be a statistical artefact and should be treated cautiously, particularly as the Self-Help subscale contains only two items. The third mediation analysis focused on drinking motives as possible mediators of the association between wellbeing and AUDIT scores. Participants with lower wellbeing drank at higher risk levels, partly because of their propensity to drink to cope (albeit this indirect effect was relatively weak). This aligns with previous research on the influence of Coping motives on risky drinking (Bresin & Mekawi, 2021; O'Hare & Shen, 2012).

While this study is exploratory, its findings support prior research indicating that targeting drinking motives may help reduce risky drinking. Should these findings be replicated, interventions could support middle-aged individuals (particularly men) with low wellbeing to recognise their drinking motives, understand how they relate to low mood and increased levels of risky drinking, and learn adaptive coping strategies to manage negative emotions (Merrill et al., 2014), as well as identify and address the causes of their low wellbeing.

This study did, however, have several limitations. While this study was cross-sectional, the regression and mediation analyses assumed a directional order to the variables (in assigning predictor, mediator, and outcome variables). Future research should explore whether these findings can be replicated longitudinally. Moreover, all measures were self-report. While participants were reminded that responses were anonymous, social desirability bias (Paulhus, 1984) remains a concern. Recall bias is also a concern, particularly when participants report behaviour over a long time period (such as a year for the AUDIT).

Separately, Wadd et al. (2011) argued that, as physiological sensitivity to alcohol increases with age, measures which include drinking volume in determining risk of dependence (like the AUDIT) may be less accurate for middle-aged or older individuals. Additionally, the AUDIT scores in this study may have been different had the original scale items been used for questions 3–8. However, this seems unlikely as internal consistency was high. The broad approach of the MHLS may also explain the lack of relationship between overall MHL and drinking motives and risky drinking in this study. It may be that alcohol-specific, disorder-specific, or component-specific MHL (as these results suggest) may be related to risky drinking. This merits further investigation. The use of the MHLS subscales within this study's analyses also formed part of an exploratory approach. Given the relatively low reliability of some subscales and use of two-item subscales, MHL research may benefit from further examination of the psychometric properties of each MHLS subscale.

Furthermore, the sample was 84% ethnically White, 64% women, 85% educated to an undergraduate level or above, and reported a relatively high mean socioeconomic status (6.97 out of 10). This is contrasted against recent population averages in England and Wales, being 82% White, 51% female, and 34% educated to an undergraduate level or above (ONS, 2021). Consequently, the results may not generalise to more diverse, particularly less educated, populations. Lastly, the prevalence of risky drinking in this sample may have been higher than usual due to the COVID-19 pandemic. UK studies have found that levels of risky drinking for individuals aged 50 and above significantly increased in 2020, following the start of the pandemic (Daly & Robinson, 2021; Rao et al., 2022).

Conclusion

This study has contributed to the limited research examining the MHL, wellbeing, drinking motives and levels of risky drinking for middle-aged adults in the UK. The results suggest that this demographic report average levels of wellbeing and similar MHL and drinking motives to other populations, although they report drinking at levels indicating a relatively high risk of alcohol dependence. Coping, Enhancement, and Conformity motives and gender were found to significantly predict risky drinking, supporting prior research emphasising the importance of drinking motives in explaining drinking behaviour. This study also suggests that the interaction of low wellbeing and drinking to cope may drive risky drinking amongst middle-aged individuals, particularly men. Future studies may examine whether alcohol-specific, component-specific, or disorder-specific MHL is associated with risky drinking and wellbeing.

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The authors report there are no competing interests to declare.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, A.C., upon reasonable request.

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