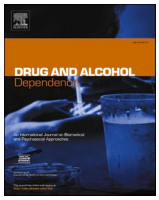
Drug and Alcohol Dependence 258 (2024) 111273

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep



I can't believe I missed that! How the fear of missing out impacts on alcohol behaviours

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ARTICLE INFO

Keywords:
Alcohol
Fear of missing out
FoMO
Ecological momentary assessment
Drinking intentions. COVID-19

ABSTRACT

Background: The Fear of Missing Out (FoMO), which is often experienced over missing opportunities for social gains associated with drinking, has been linked to heavy episodic drinking and experiencing negative consequences. The UK Coronavirus (COVID-19)-related lockdown provided a unique context to study FoMO's ability to predict of alcohol consumption. The aim of the current study was to test if FoMO predicted alcohol consumption during a time of social restrictions.

Methods: One hundred and five UK adults (aged 18–30, 61% female) participated in a study using an ecological momentary assessment design. Surveys were completed on smartphones and assessed FoMO and drinking intentions, three time a day (morning, afternoon, evening) over three consecutive weekends (Friday, Saturday, Sunday). Alcohol consumption was recorded once per day, based on previous day consumption.

Results: Repeated mixed model analyses found FoMO significantly predicted quantity of alcohol consumption (b =.05, p =.01) and drinking intentions (b =.47, p <.001), but did not predict frequency of consumption. Being male (b = 2.93, p =.02) and higher intentions (b = 0.5, p <.001) predicted higher quantity of consumption. Drinking intentions was the only variable to predict frequency of consumption (b =.004, p <.001).

Conclusions: The study showed FoMO can predict quantity of alcohol consumption and drinking intentions, which are linked to increased negative consequences. Future studies should assess FoMO against other predictive factors. Results provide an insight into how a social predictor influenced alcohol consumption during a time of restrictions.

1. Introduction

Twenty eight percent of UK adults regularly exceed the safe drinking recommendation of 14 units* of alcohol per week (NHS Digital, 2024; Chief Medical Officer, 2016). Exceeding this recommendation has been linked to negative short-term (blackouts, hangovers, violence) and longer-term (cancers, liver disease) consequences (NHS Digital, 2024; Jones et al., 2020; National Health Service, 2022). Young adults (aged 18–30) have been identified as the group most likely to exceed this recommendation (Office for National Statistics, 2018), and most likely to experience negative consequences (National Institute on Alcohol Abuse and Alcoholism, 2023). Consequently, health campaigns have been implemented to try and reduce young adults' consumption.

Health campaigns often link heavy episodic drinking (HED) (i.e., 60 g of pure alcohol or 6–8 drinks in a single session: (World Health Organisation, 2023) with experiencing regrettable consequences, e.g., unsafe sex, vomiting, injuries (Niland et al., 2013). This approach highlights the link between HED and regrettable activities to heighten risk appraisals that lead to reduced drinking (Pligt and De Vries, 1998). However, these campaigns have generally been shown to be ineffective (Babor et al., 2022) and one explanation is that young adults tend to downplay the impact of regrettable consequences (Crawford et al., 2020; de Visser and Smith, 2007). Instead, they focus more on the social gains perceived to follow drinking e.g., increased sociability, and bonding are reported as being more salient (Crawford et al., 2020). Furthermore, they often report experiencing regret over missing opportunities for social drinking (Crawford et al., 2020; Crawford, 2023). This experience is commonly referred to as the 'Fear of Missing Out'

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* 1 UK unit = 8 g of pure alcohol

https://doi.org/10.1016/j.drugalcdep.2024.111273
Received 9 November 2023; Received in revised form 1 March 2024; Accepted 19 March 2024
Available online 23 March 2024

(FoMO) and is defined as the apprehension that others are having a rewarding experience from which one is absent (Przybylski et al., 2013) or a social form of regret and rumination (Reagle, 2015).

Research investigating FoMO and young adults' alcohol consumption demonstrates positive associations with consumption in a single session and negative consequences (Riordan et al., 2015). Wolkowicz et al (Wolkowicz et al., 2023). highlight a positive relationship between trait-FoMO and alcohol craving, whilst Riordan et al (Riordan et al., 2023) report higher trait FoMO predicted greater alcohol consumption and Crawford et al (Crawford et al., 2020) suggest university students would rather experience regrettable consequences from HED than miss out on the social gains (e.g., in-jokes, shared experiences) obtained from attending drinking events. In addition, Crawford (Crawford, 2023) found that students report offsetting feelings of FoMO by attending more drinking events and by drinking more than usual amounts at these events. This suggests that experiencing FoMO may increase the frequency and quantity of alcohol consumption.

Currently, the relationship between FoMO and consumption has only been assessed using analyses where results are compared between participants based on a single measure of FoMO. Therefore, it's unknown if within-person fluctuations in FoMO affect consumption, e.g., if FoMO Is particularly high at one point does that make future consumption more likely? Wolkowicz et al (Wolkowicz et al., 2023) report the likelihood of engaging with consumption was increased when experiencing state-level cues for FoMO and alcohol. One way to assess fluctuations in FoMO is to use ecological momentary assessment (EMA), which involves repeated sampling of participants' present action and experiences (Jones et al., 2020; Shiffman, 2009), enabling researchers to measure experiences closer to performance of behaviour, often in ecologically valid settings.

A potential issue however, with EMA studies is that they are unable to assess or account for how changes in environmental conditions impact participants (e.g., settings, different groups of people) (Monk and Heim, 2014). The COVID-19 pandemic was a time of restriction which meant individuals in the UK were limited to socialising with smaller groups (e.g., housemates or a 'social bubble') and access to licenced premises was totally or partially restricted. This presented a unique socio-contextual environment in which to assess a potential predictor of alcohol consumption, as the impact of varying contextual factors was diminished. The restrictions meant that opportunities for social drinking in larger groups were limited, nonetheless Tovmasyan (Tovmasyan et al., 2023) report that during the pandemic individuals drank more when in a social context compared to non-social contexts. This suggests that even during a time of social restrictions, individuals are still motivated to consume alcohol for social reasons. The current study aimed to investigate if FoMO was experienced during this period and if these experiences influenced alcohol consumption.

In addition, the study aimed to assess if FoMO experienced during this time influenced drinking intentions. Intentions have been shown to predict alcohol consumption in studies using prospective and EMA designs (Cooke et al., 2016; Labhart et al., 2017). Past research has also shown that anticipated regret, a form of *action* regret (i.e., regret about things you did), can predict drinking intentions (Ajzen and Sheikh, 2013; Barratt and Cooke, 2018; Cooke et al., 2007). FoMO can be thought of as a form of social *inaction* regret, (i.e., regret about things you did not do), e.g., over missing opportunities for social gains (Crawford et al., 2020; Reagle, 2015). Several lines of reasoning support the idea that FoMO (inaction regret) may predict drinking intentions. First, Brewer et al.'s (Brewer et al., 2016) meta-analysis of health behaviour studies found that inaction regret had a larger association with intention than action regret, across all health behaviours.[†] Second, the temporal theory of regret suggests temporal changes in regret are driven by the nature of the regretted choice, with regrets from inaction increasing over time (Gilovich and Medvec, 1994). This suggests that FoMO may vary in intensity during different periods of the day, or as time passes following the missed drinking event. In contrast, the negative consequences experienced following action (e.g., hangovers, nausea) are likely to fade as time passes, leaving behind the sense of a missed opportunity for social gains (e.g., shared experiences and in-jokes).

The aims of the study were to test the possibility that FoMO predicts quantity and frequency of future alcohol consumption and drinking intentions. The following hypotheses were tested:

H1. : Experiencing higher levels of FoMO will result in greater quantity of alcohol consumption.

H2. : Experiencing higher levels of FoMO will result in greater frequency of alcohol consumption.

H3. : Experiencing higher levels of FoMO will result in higher drinking intentions.

2. Method

2.1. Participants

One hundred and thirty-eight young adults, aged 18–30, were recruited via social media and recruitment websites. Inclusion criteria were drinking alcohol at least once a week and scoring between 8 and 19 on the Alcohol Use Disorders Identification Test (AUDIT; (Saunders et al., 1993)), indicating drinking at hazardous or harmful levels. Twenty-five participants were excluded as they scored <8 on the AUDIT. Eight were excluded as they scored >19 and were advised to contact support services if they experienced worry. The final sample comprised 105 participants (61% female (n = 64); Mean age = 20.1 years (SD = 3.69); Mean AUDIT score = 13.65 (SD = 3.94).

2.2. Materials

2.2.1. Screening Measure

The AUDIT is a 10-item screening tool from the World Health Organisation (Selin, 2003) to identify potentially dependent alcohol use. The items assess drinking patterns and alcohol-related harm/consequences. The AUDIT has excellent reliability (Selin, 2003; Campo-Arias et al., 2013).

2.2.2. Baseline Measures

Timeline follow back (TLFB; (Sobell and Sobell, 1992)) assessed past alcohol consumption, and hence was used as the past behaviour factor in the analyses. Individuals provided retrospective estimates of their daily drinking over the previous two weeks using a calendar. The measure was adapted to include images of UK drink measures. The TLFB has been shown to have excellent reliability (Sobell et al., 1996).

Self-control was assessed using the Brief Self-Control Scale (BSCS; 34). The BSCS is a 13-item Likert scale measuring trait self-control, ranging from 1 to 5 (1 – not like me at all, to 5 – very much like me), and has been shown to have good reliability (Tangney et al., 2004).

COVID-19 risk perceptions were assessed using items from Yildirim et al (Yıldırım and Güler, 2020). The scale was adapted from a 5-point to a 0–100 Likert scale (0 – Not at all, 100 – Great extent) to capture a wider range of perceptions. The measure assessed individuals' perceived fear of COVID-19 using three items and perceived threat of COVID-19 using two items. The scale has been shown to have acceptable reliability (Yıldırım and Güler, 2020).

2.2.3. Daily measures

FoMO was assessed using an item from Riordan et al (Riordan et al.,

[†] Brewer et al. only found one paper that measured inaction regret for alcohol and because this paper sampled pregnant women, it is uncertain that results would generalise to young adults.

2021)., which provided a definition of FoMO and then asked participants to report how much FoMO they were currently experiencing. The item's scale was adapted from a 5-point (1 – no, not true of me, 5, yes, extremely true of me) to 0–100 (0 – No FoMO, 100 – Extreme FoMO) to record a greater range of FoMO intensity.

Drinking intentions were measured using a single item, which asked participants to record on a scale of 0–100 (0 – low intention, 100 – high intention) how strong their intention to drink was (French and Cooke, 2012).

Alcohol consumption was measured using an image of standard UK drink sizes and an item asking to note the number and types of drinks consumed the previous day. These recordings were later converted to UK alcohol units to reflect quantity of consumption. For frequency of consumption a binary variable was created, "Drank yesterday, 0 = no, 1 = yes".

2.3. Procedure

The host university's ethics committee approved the study. Data collection ran during the UK COVID-19 lockdowns (November 2020 to April 2021). Participants provided informed consent before completing the screening measure. Data collection took place online using surveys administered via Qualtrics. After screening, participants completed the baseline measures. Next, participants were sent a link to a survey containing the daily measures via automated email, at three times (at 10:00, 14:00 and 19:00) for three consecutive Fridays, Saturdays, and Sundays. Participants reported their current levels of FoMO and drinking intentions, with alcohol consumption being reported each morning and was based on consumption during the previous day (i.e., Thursday, Friday, Saturday). Evidence suggests young adults drink most during these days (Davis et al., 2010; Lac et al., 2016). In total, a maximum of 27 measures of FoMO and intentions, and a maximum of nine consumption surveys were completed. Participants were fully debriefed post data collection.

2.4. Data analysis

Repeated measures mixed models were used to account for the nested data, i.e., time points nested within participants. We estimated fixed effects according to the focal independent variables (FoMO and drinking intention) and covariates (time of day, day of the week and week of study), whilst accounting for the control variables (gender, past behaviour, self-control, fear of COVID-19 and threat of COVID-19). For quantity and frequency of consumption models, 'time of day' was not included as a covariate as alcohol consumption was recorded once per day. In addition, these models only include consumption scores for Fridays and Saturdays, as recorded scores on Fridays represent consumption from the preceding Thursday. Furthermore, alcohol consumption measurements were lagged, meaning assessment of how the focal variables influence behaviour could be made. Measurements of FoMO were contemporaneous with drinking intentions, meaning assessment of how the focal variable influenced the outcome in real-time could be made. Random intercepts between participants were factored in and included a random effect of time, which enabled us to model variability in intercepts and slopes within participants. We examined interactions to assess and account for any changes in the outcome variables (frequency and quantity of alcohol consumption and drinking intentions) over time. We used restricted maximum likelihood estimation method and an unstructured covariance structure. To model residual within-subjects variance, due to the lag-effect, we added a final step in the models to account for any nuisance variance (i.e., the correlation between time points), using an autoregressive covariance structure. To assess for bias in missing data points, we used Little's missing completely at random (MCAR) test and completed multiple imputations using the automatic function in SPSS 29.

3. Results

3.1. Descriptive analyses

Compliance rates ranged from 11.1% to 100%, overall compliance was 45.4% and 1288 individual responses were recorded. To account for potential bias a Little's MCAR was ran, which indicated that the missing data was random $\chi^2 = (7, N = 105) = 10.65$, $p = .155$, hence multiple imputation was performed.

Average alcohol consumption in the two weeks prior to the study was 38.50 units (SD = 26.16), suggesting hazardous weekly alcohol use (NHS Digital, 2024; Chief Medical Officer, 2016). The average score for self-control was 34.49 (SD = 7.71), for perceived fear of COVID-19 it was 79.75 (SD = 67.23), and perceived threat of COVID-19 was 90.26 (SD = 53.42). These scores were on the lower end of the scales, indicating participants viewed the risks of COVID-19 as relatively minimal.

The average FoMO score was 28.68 (SD = 27.13; Median = 20.00, Mode = 0.00, IQR = 42.00) indicating lower levels of FoMO. The average intention score was 45.20 (SD = 35.84; Median = 41.00, IQR = 70) just below the mid-point of the scale. The average amount of alcohol consumed was 9.06 units (SD = 6.72) per day, suggesting heavy episodic patterns of alcohol use, although, consumption did vary by day; on Thursdays, participants recorded drinking on average 7.65 (SD = 5.97) units, on Fridays 10.64 (SD =7.76) units and Saturdays 8.50 (SD = 5.76) units. Drinking intentions were higher on Fridays (M = 50.72, SD = 35.14) and Saturdays (M = 48.51, SD = 36.46) than Sundays (M = 36.12, SD = 34.20). FoMO scores peaked on Fridays (M = 31.77; SD = 27.63) before declining on Saturdays (M = 28.75, SD = 26.36) and Sundays (M = 25.74, SD = 27.17). Table 1 summarises results for FoMO and Table 2 results for intentions for week of study; there was little evidence of differences due to week of study.

3.1.1. Repeated measures mixed model for quantity of alcohol consumption

There was no difference in the imputed results compared to the available data, hence these results are presented (see appendix for imputed results). None of the time trends significantly described the pattern of quantity of alcohol consumption over time: linear, $p = .81$, quadratic, $p = .35$ and cubic, $p = .31$. The relationship between time and quantity of alcohol showed non-significant variance in intercepts across participants, Var(u0j) = 27.22, χ^2 (1) = +4.04, $p > .05$. However, slopes varied across participants, Var(u1j) =.14, χ^2 (1) = 17.59, p <.01, and intercepts and slopes negatively and significantly covaried, Cov(u0j,u1j) = −1.36, χ^2 (1) = 17.59, $p < .01$, suggesting those who decreased the quantity of consumed alcohol during the study, reporting drinking most towards the start. In addition, there was a significant and positive relationship between participants' consumption at adjacent time points, with a covariance of.70, $p < .001$.

Table 3 provides the results for the repeated measures mixed model for quantity of alcohol consumption. Gender, $b = 3.00$, $p = .020$, 95% CI [.57, 5.42], drinking intentions, $b = .05$, $p < .001$, 95% CI [.03,.07], and FoMO, $b = .05$, $p = .01$, 95% CI [.01,.09] all significantly predicted consumption. Being male, reporting higher intentions (see Figure 1) and higher FoMO (see Figure 2) were all associated with higher consumption. There was also significant interaction between FoMO and time, $F(1, 23.02) = 7.30$, $p = .01$, with FoMO having a greater effect on quantity consumed towards the start of the study, $b = -.01$, $p = .01$, 95% CI [-.01, −.002]. As time progressed, the effect of FoMO on quantity consumed reduced.

3.1.2. Repeated measures mixed model for frequency of alcohol consumption

The imputed data produced a different result than the available data, hence these results are reported here (see appendix for the available data results). None of the time trends significantly described the pattern of frequency of alcohol consumption over time: linear, $p = .16$, quadratic, $p = .35$ and cubic, $p = .35$. The relationship between time and frequency of

alcohol consumption showed non-significant variance in intercepts across participants, Var(u0j) =.09, χ^2 (1) = +6.34, p >.05. However, slopes varied across participants, Var(u1j) =.03, χ^2 (1) = 20.40, p <.01, and intercepts and slopes negatively and significantly covaried, Cov(u0j, u1j) = −.05, χ^2 (1) = 20.40, p <.01, suggesting those who decreased their frequency of drinking episodes over the course of the study, reported higher episodes towards the start of the study. In addition, there was a significant, positive, relationship between participants' consumption at adjacent time points, with a covariance of.70, p <.001. Table 4 provides the results for the repeated measures mixed model for frequency of alcohol consumption. Intentions was the only significant predictor for frequency of consumption, b =.004, p <.001, 95% CI [.003,.005].

3.1.3. Repeated measures mixed model for drinking intentions

There was no difference in the imputed results compared to the available data, hence these results are presented (see appendix for imputed results table). Time had a significant effect on drinking intention; a cubic trend significantly described the pattern of data over time, F (1, 1095.60) = 22.65, p <.001, with intentions decreasing over time, b = −.01, p <.001. The effect of time resulted in an overall decrease of 0.27 units over the course of the study. The relationship between time and intentions showed significant variance in intercepts across participants Var(u0j) = 384.07, χ^2 (1) = 13.56, p <.01. In addition, the slopes varied across participants, Var(u0j) = 3.28, χ^2 (1) = 37.51, p =.002, and the intercepts slopes negatively and significantly covaried, Cov(u0j,u1j) = −02, χ^2 (1) = 37.51, p =.01, suggesting those that decreased their drinking intentions over the study, reported higher intentions at the start. Further to this, there was a significant and positive relationship between intentions at adjacent time points, with a covariance of.47, p <.001.

Table 5 provides results for the repeated measures mixed model for drinking intentions. Day of the Week predicted intentions: Participants recorded significantly higher drinking intentions on Fridays, b = 12.34, p =.001, 95% CI [5.11, 19.26] and Saturdays, b = 10.11, p <.001, 95% CI [4.89, 14.97] compared to Sundays, but there was no significant difference between Fridays and Saturdays, p =.39. Past Behaviour, b =.22, p =.02, 95% CI [.04,.41], and FoMO, b =.47, p <.001, 95% CI [.35,.51], both had positive effects on intentions (see Figures 3 and 4). There were no other significant effects.

4. Discussion

The current EMA study assessed if FoMO experienced during the COVID-19 lockdown influenced alcohol consumption and drinking intentions. As predicted, experiencing higher levels of FoMO was associated with increased quantity of alcohol consumption and higher drinking intentions, however, FoMO failed to predict frequency of consumption. Higher drinking intentions were associated with both greater quantity and frequency of consumption.

To our knowledge, this is the first study to show within-person fluctuations in FoMO are associated with quantity of alcohol consumed. This is important as evidence indicates that higher levels of consumption are associated with higher risk for injury and harm (Chikritzhs and Livingston, 2021). The results support the suggestion that even in a period of restrictions, individuals are influenced by social reasons for drinking (Tovmasyan et al., 2023). Furthermore, the results add to the literature by highlighting that state-like FoMO predicts consumption, in addition to trait-like FoMO (Riordan et al., 2023). This finding also supports the suggestion experiencing state-like FoMO is associated with a greater likelihood to consume alcohol (Wolkowicz et al., 2023), and qualitative accounts that suggest experiencing FoMO can drive alcohol consumption (Crawford et al., 2020; Crawford, 2023).

Extant literature highlights that anticipated action regret (regret from future actions) fails to predict consumption (Cooke and Crawford, 2021), whilst the current study highlights an association between inaction regret (FoMO) and quantity of consumption. This is consistent with Brewer et al (Brewer et al., 2016). who highlight significant correlations between inaction regret and health behaviour. Albarracin and Hart (Albarracin and Hart, 2011) highlight inaction and negative mood have a greater impact on decision-making and performance than action and negative mood. This offers an explanation as to why anti-drinking campaigns that highlight negative affect (e.g., regret) experienced following HED have been shown to be ineffective at reducing alcohol consumption (Babor et al., 2022). The current results highlight a potential new avenue for intervention, targeting the negative emotion caused by inaction (i.e. FoMO following missing opportunities for social drinking).

In contrast to results linking FoMO to quantity of consumption, FoMO failed to predict frequency of consumption, suggesting experiencing FoMO may not influence the decision to drink. The restrictions in place during the pandemic will have limited opportunities to engage with alcohol consumption, nonetheless we must also consider the wide range of individual-level and population-level factors that interact to shape alcohol use, (e.g., cultural, environmental and policy) (Sudhinaraset et al., 2016), hence the effect of a single social factor will be limited. It may be that different factors are needed to predict quantity and consumption because drinking higher quantity of alcohol is not always linked to drinking more frequently (Miller et al., 2005). In addition, those that drink less frequently but consume greater quantities of alcohol when they do decide to drink, are more likely to experience negative consequences, compared to those who drink more frequently, albeit in smaller quantities (Miller et al., 2005). This is an important distinction for preventive efforts, as understanding what predicts higher quantities of consumption can help identify targets to reduce harm.

FoMO also predicted drinking intentions. According to Ajzen's (Ajzen, 1991) Theory of Planned Behaviour, intentions are based on salient beliefs about behavioural performance. Thus, FoMO's impact on drinking intentions could be explained by considering how the experience of missing out impacts salient beliefs regarding consumption (see French & Cooke (French and Cooke, 2012)). For example, when hearing about or viewing social media posts of a missed event, individuals are reminded of the social gains of attending drinking events (e.g., having fun, making new friends, 11). In addition, the notifications of missed events reinforce the approval of engaging with consumption; positive alcohol-related images are ubiquitous online (Hendriks et al., 2018; Lyons et al., 2016). The activation of salient behavioural and normative beliefs via notification of missed events gives rise to the sense of missing out, and in turn motivates greater intention for future drinking. Positive posts viewed by individuals who missed an event could serve to amplify feelings of FoMO because those individuals are seeing the social gains without experiencing the negative consequences (Crawford et al., 2020).

While the current study highlights links between FoMO, quantity of consumption and intentions, future studies should assess the validity of FoMO against other predictive factors, for example other related social constructs such as descriptive or injunctive norms (Cooke and Crawford, 2021). Furthermore, studies should investigate what factors drive the FoMO-alcohol relationship, assessing potential mediating/moderating factors. For example, dimensions of personality such as sensation-seeking, neuroticism, and extraversion (Rozgonjuk et al., 2021), or other factors related to our basic need for relatedness such as the 'need to belong' (Beyens et al., 2016). Additionally, analysis of how FoMO interacts with other factors such as culture should be completed, which would increase the generalisability of the results.

The study has several strengths. FoMO and intentions were collected in real-time, providing a smaller measurement gap between these variables and consumption than is typically found in survey research. As noted by Ajzen (Ajzen, 1996) the shorter the gap between measurement of intentions and behaviour the more likely intentions are to predict behaviour, because intentions are less likely to have changed. More stable intentions better predict behaviour compared with less stable intentions (Cooke and Sheeran, 2004, 2013). Alcohol consumption was

measured on three separate weekends, increasing confidence in findings. Furthermore, using an EMA design enabled a test on how changes in FoMO impacted consumption and intentions. In addition, the results provide an insight into how a social factor influences alcohol use during a unique period of restrictions, however we recommend replicating the study in a less restrictive timeframe.

The study has limitations. Whilst EMA can overcome limitations of traditional survey methods, it nevertheless relies on self-reports that assume an individual is able to accurately gauge how they feel at any given time, which cannot always be guaranteed (Robins et al., 2009). Furthermore, we cannot be certain what was driving the effect of FoMO, as restrictions meant opportunities for attending social events were limited. It might be that those experiencing FoMO drank more alcohol to alleviate negative affect; qualitative data suggests young adults increase their consumption to cope with associated negative affect from FoMO (Crawford, 2023). Finally, compliance was an issue, nonetheless the current study used more assessments and a longer assessment period than average (Wrzus and Neubauer, 2023). Future studies may consider using fewer assessments to reduce the load on participants.

To conclude the current study demonstrated that during a time of social restrictions, FoMO was experienced, and it significantly predicted quantity of consumption and intentions. These results highlight how an imagined sense of missing out has a real effect on individuals' perceptions and behaviour.

Role of Funding Source

The study was funded by the School of Psychology at Liverpool University, United Kingdom. The funders had no role in the design, analysis or writing of the study.

CRediT authorship contribution statement

Joel Crawford: Conceptualization, Data curation, Formal analysis, Investigation, Project administration, Software, Writing – original draft, Writing – review & editing. **Andrew Jones:** Writing – review & editing. **Abigail Rose:** Writing – review & editing. **Richard Cooke:** Supervision, Writing – review & editing.

Declaration of Competing Interest

None to report.

Acknowledgements

None

APPENDICIES A.

FIGURES

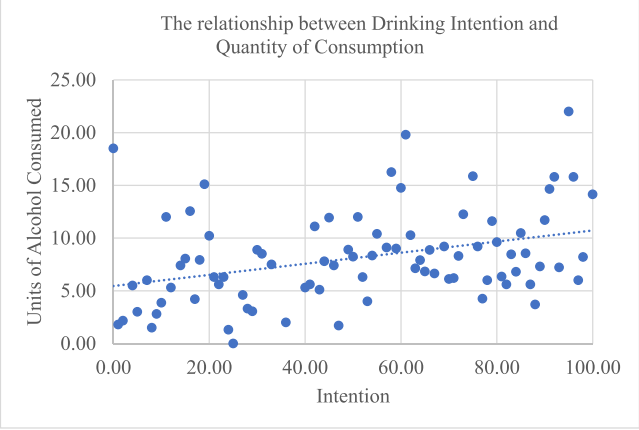

Figure 1. The relationship between Drinking Intention and Quantity of Consumption.

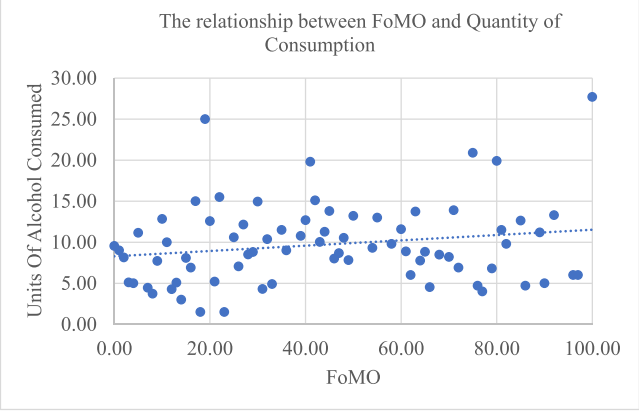

Figure 2. The relationship between FoMO and Quantity of Consumption.

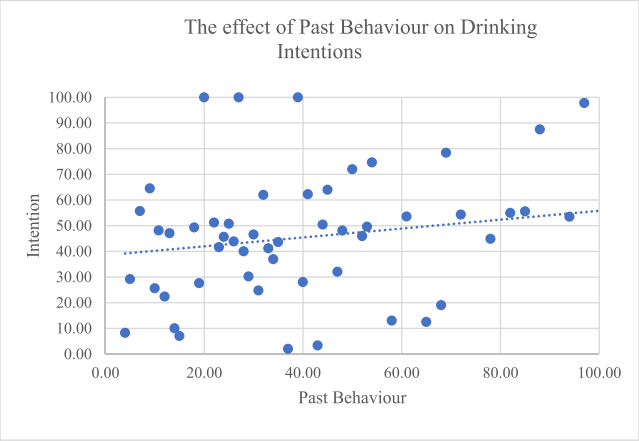

Figure 3. The effect of Past Behaviour on Drinking Intentions.

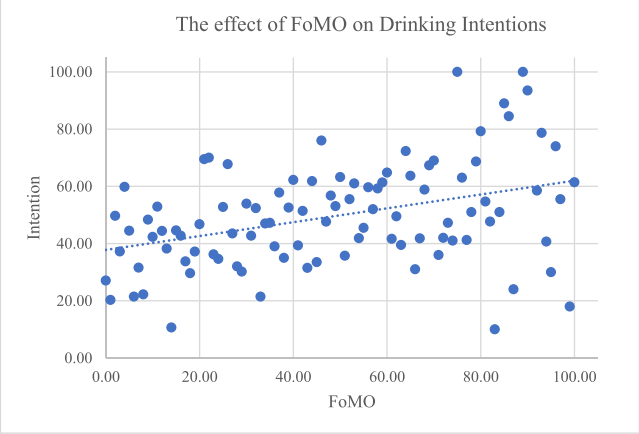

Figure 4. The effect of FoMO on Drinking Intentions.

TABLES

Table 1
FoMO scores for Time of Day and Day of the Week.

	Morning	Afternoon	Evening	Total
	(n = 362)	(n = 426)	(n = 353)	(n = 1141)
Friday (n = 363)	28.95 (28.12)	32.99 (26.91)	33.27 (27.97)	31.77 (27.63)
Saturday (n = 388)	26.95 (26.91)	28.25 (25.67)	31.40 (26.67)	28.75 (26.36)
Sunday (n = 390)	25.58 (26.61)	27.11 (28.75)	24.32 (25.95)	25.74 (27.17)
Total (n = 1141)	27.15 (27.18)	29.34 (27.18)	29.45 (27.05)	

Table 2
Intention scores for Time of Dat and Day of the Week.

	Morning	Afternoon	Evening	Total
	(n = 369)	(n = 427)	(n = 357)	(n = 1153)
Friday (n = 373)	50.78 (33.10)	50.73 (35.12)	50.64 (37.47)	50.72 (35.14)
Saturday (n = 396)	47.06 (35.64)	47.58 (35.23)	51.20 (38.89)	48.51 (36.46)
Sunday (n = 384)	31.78 (30.33)	36.44 (33.68)	40.11 (37.99)	36.12 (34.20)
Total (n = 1153)	43.17 (34.04)	45.01 (35.15)	47.20 (38.37)	

Table 3
Mixed Model for Quantity of Alcohol Consumption.

Parameter	I	II	III	IV	V	VI	VII	VIII
Fixed Intercept	9.21 (.73)***	9.22 (.83)***	7.56 (4.84)	14.29 (6.23)*	9.67 (6.73)	7.55 (7.00)	7.56 (6.93)	13.24 (5.60)*
Day of the week			2.03 (1.04)	1.78 (1.05)	.80 (1.17)	1.51 (1.24)	1.02 (1.24)	.54 (.89)
Week One			.32 (3.63)	-.24 (3.68)	-3.42 (4.19)	-1.10 (4.40)	-2.64 (4.39)	-6.14 (3.10)
Week Two			.15 (1.91)	-.20 (1.94)	-1.36 (2.21)	-.19 (2.31)	-.93 (2.31)	-3.05 (1.85)
Gender				1.44 (1.13)	3.22 (1.19)*	3.28 (1.21)*	3.10 (1.19)*	3.00 (1.20)*
Past behaviour				.01 (.02)	-.002 (.02)	-.002 (.02)	-.002 (.02)	.01 (.02)
Self-control				-.22 (.08)*	-.15 (.09)	-.16 (.09)	-.14 (.09)	-.15 (.09)
Fear of COVID				-.02 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)
Threat of COVID				.01 (.01)	.004 (.01)	.002 (.01)	.003 (.01)	-.002 (.01)
Intention					.07 (.01)***	.06 (.01)***	.06 (.01)***	.05 (.01)***
FoMO						.003 (.01)	.06 (.03)*	.05 (.02)*
FoMO*Time							-.01 (.003)*	-.01 (.002)*
Random								
Time		-1.15 (.58)	-1.11 (.57)	-.98 (.36)	-.95 (.36)	-1.08 (.59)	-.95 (.56)	.03 (.28)
Within-subjects autocorrelation								.70 (.05)***
Deviance (-2LL)	2907.56	2895.00	2876.28	2774.93	2129.13	1953.71	1956.02	1840.15

I = Unconditional Model, II = I + Linear Time, III = II + Day of Week + Week of Study, IV = III + Control Variables, V = IV + Intention, VI = V + FoMO, VII = VI + Interaction, VIII = VII + Residual within-subjects variance. * = p <.05, ** = p <.01, *** = p <.00

Table 4
Mixed Model for Frequency of Alcohol Consumption.

Parameter	I	II	III	IV	V	VI	VII	VIII
Fixed Intercept	1.54 (.04)***	1.51(.05)***	1.56 (.44)***	1.30 (.45)*	1.40 (.47)*	1.39 (.47)*	1.39 (.47)*	1.48 (.38)*
Day of the week			.21 (.83)	.01 (.06)	-.06 (.06)	-.06 (.06)	-.0.6 (.06)	-.04 (.04)
Week One			-.11 (.91)	-.04 (.31)	-.41 (.33)	-.40 (.33)	-.40 (.33)	-.39 (.21)
Week Two			-.04 (1.56)	-.05 (.16)	-.20 (.17)	-.20 (.17)	-.19 (.17)	-.21 (.11)
Gender				-.02 (.08)	-01 (.07)	-.01 (.07)	-.001 (.07)	.002 (.07)
Past behaviour				.004 (.001)*	.002 (.001)	.002 (.001)	.002 (.01)	.002 (.001)
Self-control				.001 (.001)	.001 (.01)	.001 (.01)	.001 (.01)	-.001 (.01)
Fear of COVID				.001 (.001)	.001 (.001)	.001 (.001)	.001 (.001)	.001 (.001)
Threat of COVID				<.001 (<.001)	.001 (.001)	.001 (.001)	.001 (.001)	.001 (.001)
Intention					.01 (.001)***	.01 (.001)***	.01 (.01)***	.004 (.001)***
FoMO						<-.001 (.001)	-.001 (.001)	<-.001 (.001)
FoMO*Time							<-.001 (<.001)	<-.001 (.001)
Random								
Time		-.004 (.002)*	-.004 (.002)*	-.003 (.002)*	-.002 (.001)	-.002 (.001)	-.002 (.002)	.003 (.03)
Within-subjects autocorrelation								.70 (.04)***
Deviance (-2LL)	1037.62	1017.22	1027.14	1033.66	673.16	685.71	702.98	464.71

I = Unconditional Model, II = I + Linear Time, III = II + Day of Week + Week of Study, IV = III + Control Variables, V = IV + Intention, VI = V + FoMO, VII = VI + Interaction, VIII = VII + Residual within-subjects variance. * = p <.05, ** = p <.01, *** = p <.001

Table 5
Mixed Model for Drinking Intentions.

Parameter	I	II	III	IV	V	VI	VII
Fixed Intercept	43.41 (2.31)***	57.53 (3.56)***	38.18 (9.80)***	43.65 (17.23)*	38.67 (17.95)*	44.50 (12.82)***	34.04 (19.32)
Morning			-4.65 (2.29)	-5.02 (2.35)	-3.84 (2.29)	-.48 (3.24)	-4.63 (2.66)
Afternoon			-2.88 (2.10)	-2.94 (2.16)	-1.45 (2.09)	-1.13 (3.11)	-3.25 (2.40)
Friday			14.96 (3.2)***	14.74 (3.27)***	11.77 (2.28)***	11.47 (3.25)***	12.34 (3.61)***
Saturday			13.11 (2.31)***	12.86 (2.38)***	9.34 (2.31)***	9.26 (2.35)***	10.11 (2.58)***
Week One			4.88 (5.24)	5.07 (5.39)	3.49 (5.23)	3.53 (5.32)	4.89 (6.26)
Gender				3.67 (4.23)	.49 (4.59)	.-94 (2.50)	1.32 (4.65)
Past behaviour				.26 (.09)*	.22 (.10)*	.29 (.05)***	.22 (.09)*
Self-control				-.53 (.30)	-.63 (.32)	-.69 (.17)***	-.59 (.33)
Fear of COVID				.02 (.04)	.03 (.04)	.03 (.02)	.02 (.04)
Threat of COVID				-.04 (.04)	-.26 (.04)	-.06 (.03)	-.02 (.05)
FoMO					.47 (.04)***	.47 (.08)***	.47 (.08)***
FoMO*Time						-.01 (.08)	-.004 (.01)
FoMO*Morning						-.11 (.08)	.001 (.07)
FoMO*Afternoon						-.01 (.08)	.03 (.06)
Random							
Time		-.02 (.01)*	-.02 (.01)*	-.02 (.01)*	-.01 (.01)*	.02 (.001)	-.01 (.01)

(*continued on next page*)

Table 5 (*continued*)

Parameter	I	II	III	IV	V	VI	VII
Within-subjects autocorrelation							.47 (.04)***
Deviance (-2LL)	11292.52	11241.10	11175.40	10764.63	9909.91	10045.33	9779.09

I = Unconditional Model
II = I + Cubic Time
III = II + Time of Day + Day of Week + Week of Study
IV = III + Control variables
V = IV + FoMO
VI = V + Interactions
VII = VI + residual within-subjects variance
* = p <.05, ** = p <.01, *** = p <.001

References

Ajzen, I., 1991. The theory of planned behavior. Organ. Behav. Hum. Decis. Process. 50 (2), 179–211.

Ajzen, I., 1996. The social psychology of decision making. Soc. Psychol.: Handb. Basic Princ. 297–325.

Ajzen, I., Sheikh, S., 2013. Action versus inaction: anticipated affect in the theory of planned behavior (Available from:). J. Appl. Soc. Psychol. 43 (1), 155–162. https://doi.org/10.1111/j.1559-1816.2012.00989.x.

Albarracin, D., Hart, W., 2011. Positive mood+ action= negative mood+ inaction: effects of general action and inaction concepts on decisions and performance as a function of affect (Available from:). Emotion 11 (4), 951. https://doi.org/10.1037/a0024130.

Babor, T.F., Casswell, S., Graham, K., Huckle, T., Livingstone, M., Österberg, E., et al., 2022. Alcohol: No ordinary commodity, third edition. Oxford University Press.

Barratt, J.M., Cooke, R., 2018. Do gender and year of study affect the ability of the theory of planned behaviour to predict binge-drinking intentions and episodes? (Available from:). Drug.: Educ., Prev. Policy 25 (2), 181–188. https://doi.org/10.1080/09687637.2016.1257564.

Beyens, I., Frison, E., Eggermont, S., 2016. I don't want to miss a thing": adolescents' fear of missing out and its relationship to adolescents' social needs, facebook use, and Facebook related stress (Available from:). Comput. Hum. Behav. 64, 1–8. https://doi.org/10.1016/j.chb.2016.05.083.

Brewer, N.T., DeFrank, J.T., Gilkey, M.B., 2016. Anticipated regret and health behavior: a meta-analysis (Available from:). Health Psychol. 35 (11), 1264. https://doi.org/10.1037/hea0000294.

Campo-Arias, A., Villamil-Vargas, M., Herazo, E., 2013. Reliability and dimensionality of the AUDIT in medical students. Psicol. ía desde el Caribe 30 (1)), 21–35.

Chief Medical Officer. The UK Chief Medical Officers' Low Risk Drinking Guidelines 2016; 2016 Sep 2. Available from: ⟨https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/545937/UK_CMOs_report.pdf⟩

Chikritzhs, T., Livingston, M., 2021. Alcohol and the Risk of Injury. Nutrients 13, 2777. The Impact of Alcoholic Beverages on Human Health. 2021;147. Available from: https://doi.org/10.3390%2Fnu13082777.

Cooke, R., Crawford, J., 2021. Psychological Predictors of Alcohol Consumption. In: Cooke, R., Conroy, D., Davies, E.L., Hagger, M.S., de Visser, R.O. (Eds.), The Palgrave Handbook of Psychological Perspectives on Alcohol Consumption. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-66941-6_4.

Cooke, R., Sheeran, P., 2004. Moderation of cognition-intention and cognition-behaviour relations: a meta-analysis of properties of variables from the theory of planned behaviour (Available from:). Br. J. Soc. Psychol. 43 (2), 159–186. https://doi.org/10.1348/0144666041501688.

Cooke, R., Sheeran, P., 2013. Properties of intention: component structure and consequences for behavior, information processing, and resistance (Available from:). J. Appl. Soc. Psychol. 43 (4), 749–760. https://doi.org/10.1111/jasp.12003.

Cooke, R., Sniehotta, F., Schüz, B., 2007. Predicting binge-drinking behaviour using an extended TPB: examining the impact of anticipated regret and descriptive norms (Available from:). Alcohol. Alcohol. 42 (2), 84–91. https://doi.org/10.1093/alcalc/agl115.

Cooke, R., Dahdah, M., Norman, P., French, D.P., 2016. How well does the theory of planned behaviour predict alcohol consumption? A systematic review and meta-analysis (Available from:). Health Psychol. Rev. 10 (2), 148–167. https://doi.org/10.1080/17437199.2014.947547.

Crawford J. That could have been the best night ever-Developing knowledge on how regret influences alcohol beliefs and behaviour (Doctoral dissertation, The University of Liverpool (United Kingdom)). 2023. Available from: ⟨https://livrepository.liverpool.ac.uk/id/eprint/3169411⟩

Crawford, J., Jones, A., Rose, A., Cooke, R., 2020. You see the pictures the morning after and you're like I wish I was in them": an interpretative phenomenological analysis of university student's alcohol-related regrets (Available from:). Psychol. Health. https://doi.org/10.1080/08870446.2020.1867728.

Davis, C.G., Thake, J., Vilhena, N., 2010. Social desirability biases in self-reported alcohol consumption and harms. Addict. Behav. 35 (4), 302–311.

French, D.P., Cooke, R., 2012. Using the theory of planned behaviour to understand binge drinking: the importance of beliefs for developing interventions (Available from:). Br. J. Health Psychol. 17 (1), 1–17. https://doi.org/10.1111/j.2044-8287.2010.02010.x.

Gilovich, T., Medvec, V.H., 1994. The temporal pattern to the experience of regret (Available from:). J. Personal. Soc. Psychol. 67 (3), 357. https://doi.org/10.1037/0022-3514.67.3.357.

Hendriks, H., Van den Putte, B., Gebhardt, W.A., Moreno, M.A., 2018. Social drinking on social media: content analysis of the social aspects of alcohol-related posts on Facebook and Instagram (Available from:). J. Med. Internet Res. 20 (6), e9355. https://doi.org/10.2196/jmir.9355.

Jones, A., Crawford, J., Rose, A., Christensen, P., Cooke, R., 2020. Regret me not: Examining the relationship between alcohol consumption and regrettable experiences. Subst. Use Misuse. Available from: ⟨https://doi.org/10.1080/10826084.2020.1817084⟩ National Health Service. Alcohol Misuse: Risks; 2022 Oct 04. Available from: ⟨https://www.nhs.uk/conditions/alcohol-misuse/risks/⟩.

Labhart, F., Anderson, K.G., Kuntsche, E., 2017. The spirit is willing, but the flesh is weak: Why young people drink more than intended on weekend nights—An event-level study (Available from:). Alcohol.: Clin. Exp. Res. 41 (11), 1961–1969. https://doi.org/10.1111/acer.13490.

Lac, A., Handren, L., Crano, W.D., 2016. Conceptualizing and measuring weekend versus weekday alcohol use: item response theory and confirmatory factor analysis (Available from:). Prev. Sci. 17 (7), 872–881. https://doi.org/10.1007/s11121-016-0685-9.

Lyons, A., Goodwin, I., Griffin, C., McCreanor, T., Moewaka Barnes, H., 2016. Facebook and the fun of drinking photos: reproducing gendered regimes of power. Soc. Media + Soc. 2 (4), 2056305116672888. Available from: https://doi.org/10.1177%2F2056305116672888.

Miller, P., Plant, M., Plant, M., 2005. Spreading out or concentrating weekly consumption: alcohol problems and other consequences within a UK population sample (Available from:). Alcohol. Alcohol. 40 (5), 461–468. https://doi.org/10.1093/alcalc/agh169.

Monk, R.L., Heim, D., 2014. A real-time examination of context effects on alcohol cognitions (Sep). Alcohol.: Clin. Exp. Res. 38 (9), 2454–2459. https://doi.org/10.1111/acer.12504.

National Health Service. Alcohol Misuse: Risks, 2022. Available from: ⟨https://www.nhs.uk/conditions/alcohol-misuse/risks/⟩

National Institute on Alcohol Abuse and Alcoholism. Alcohol and Young Adults Ages 18 to 25; 2023 Jan 11. Available from: ⟨https://www.niaaa.nih.gov/alcohols-effects-health/alcohol-topics/alcohol-facts-and-statistics/alcohol-and-young-adults-ages-18-25⟩

NHS Digital [Internet]. [cited 2024 Feb 13]. Part 3: Drinking alcohol. Available from: ⟨https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2021/part-3-drinking-alcohol⟩

Niland, P., Lyons, A., Goodwin, I., Hutton, F., 2013. Everyone can loosen up and get a bit of a buzz on": young adults, alcohol and friendship practices (Available from:). Int. J. Drug Policy 24 (6), 530–537. https://doi.org/10.1016/j.drugpo.2013.05.013.

Office for National Statistics. Adult drinking habits in Great Britain; 2018. Available from: ⟨https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/drugusealcoholandsmoking/datasets/adultdrinkinghabits⟩

Pligt, J.V., De Vries, N.K., 1998. Expectancy-value models of health behaviour: the role of salience and anticipated affect. Psychol. Health 13 (2), 289–305.

Przybylski, A.K., Murayama, K., DeHaan, C.R., Gladwell, V., 2013. Motivational, emotional, and behavioral correlates of fear of missing out (Available from:). Comput. Hum. Behav. 29 (4), 1841–1848. https://doi.org/10.1016/j.chb.2013.02.014.

Reagle, J., 2015. Following the Joneses: FOMO and conspicuous sociality (Available from:). First Monday 20 (10). https://doi.org/10.5210/fm.v20i10.6064.

Riordan, B.C., Flett, J.A., Hunter, J.A., Scarf, D., Conner, T.S., 2015. Fear of missing out (FoMO): the relationship between FoMO, alcohol use, and alcohol-related consequences in college students (Available from:). Ann. Neurosci. Psychol. 2 (7), 1–7. https://doi.org/10.7243/2055-3447-2-9.

Riordan, B.C., Cody, L., Flett, J.A., Conner, T.S., Hunter, J., Scarf, D., 2021. The development of a single item FoMO (fear of missing out) scale (Available from:). Curr. Psychol. 1–6. https://doi.org/10.1007/s12144-018-9824-8.

Riordan, B.C., Conner, T.S., Scarf, D., Winter, T., Mason, A., Anderson-Luxford, D., Kuntsche, E., 2023. FoMO predicts alcohol use and harms over and above the big five personality traits among university students (Available from:). J. Subst. Use 1–5. https://doi.org/10.1080/14659891.2023.2288846.

Robins, R.W., Fraley, R.C., Krueger, R.F., 2009. Handbook of research methods in personality psychology. Guilford Press.
Rozgonjuk, D., Sindermann, C., Elhai, J.D., Montag, C., 2021. Individual differences in Fear of Missing Out (FoMO): age, gender, and the Big Five personality trait domains, facets, and items (Available from:). Personal. Individ. Differ. 171, 110546. https://doi.org/10.1016/j.paid.2020.110546.
Saunders, J.B., Aasland, O.G., Babor, T.F., De la Fuente, J.R., Grant, M., 1993. Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II (Available from:). Addiction 88 (6), 791–804. https://doi.org/10.1111/j.1360-0443.1993.tb02093.x.
Selin, K.H., 2003. Test-retest reliability of the alcohol use disorder identification test in a general population sample (Available from:). Alcohol.: Clin. Exp. Res. 27 (9), 1428–1435. https://doi.org/10.1097/01.ALC.0000085633.23230.4A.
Shiffman, S., 2009. Ecological momentary assessment (EMA) in studies of substance use (Available from:). Psychol. Assess. 21 (4), 486. https://doi.org/10.1037/a0017074.
Sobell, L.C., Sobell, M.B., 1992. Timeline follow-back. In Measuring alcohol consumption. Humana Press, Totowa, NJ, pp. 41–72. https://doi.org/10.1007/978-1-4612-0357-5_3.
Sobell, L.C., Brown, J., Leo, G.I., Sobell, M.B., 1996. The reliability of the Alcohol Timeline Followback when administered by telephone and by computer (Available from:). Drug Alcohol Depend. 42 (1), 49–54. https://doi.org/10.1016/0376-8716(96)01263-X.
Sudhinaraset, M., Wigglesworth, C., Takeuchi, D.T., 2016. Social and cultural contexts of alcohol use: influences in a social–ecological framework. Alcohol Res.: Curr. Rev. 38 (1), 35–45 (Available from:).
Tangney, J.P., Baumeister, R.F., Boone, A.L., 2004. High self-control predicts good adjustment, less pathology, better grades, and interpersonal success (Available from:). J. Personal. 72 (2), 271–324. https://doi.org/10.1111/j.0022-3506.2004.00263.x.
Tovmasyan, A., Monk, R.L., Qureshi, A., Bunting, B., Heim, D., 2023. Affect and alcohol consumption: an ecological momentary assessment study during national lockdown. Exp. Clin. Psychopharmacol. 31 (1), 92. Available from: https://doi/10.1037/pha0000555.
de Visser, R.O., Smith, J.A., 2007. Young men's ambivalence toward alcohol. Soc. Sci. Med. 64 (2), 350–362.
Wolkowicz, N.R., Ham, L.S., Carrigan, M., Pazda, A.D., 2023. Trait-and State-Fear of Missing Out: influences on alcohol craving and drinking likelihood (Available from:). J. Stud. Alcohol Drugs 84 (2), 245–256. https://doi.org/10.15288/jsad.22-00079.
World Health Organisation, 2023. drinking (population) past 30 days. Glob. Health Obs.: Alcohol, Heavy episodic. Available from ⟨https://www.who.int/data/gho/indicator-metadata-registry/imr-details/459⟩.
Wrzus, C., Neubauer, A.B., 2023. Ecological momentary assessment: a meta-analysis on designs, samples, and compliance across research fields (Available from:). Assessment 30 (3), 825–846. https://doi.org/10.1177/10731911211067538.
Yıldırım, M., Güler, A., 2020. Factor analysis of the COVID-19 perceived risk scale: a preliminary study (Available from:). Death Stud. 1–8. https://doi.org/10.1080/07481187.2020.1784311.