



Development and validation of problematic mukbang watching scale and mukbang watching motives scale: A cross-sectional study with adult mukbang watchers

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ABSTRACT

Growing empirical evidence suggests that an emerging online activity (i.e., mukbang watching) may be associated with negative mental and physical health outcomes. However, a large gap in the psychology of mukbang watching still remains. Based on the extant literature, the present study developed and validated psychometric instruments to assess problematic (e.g., addictive) mukbang watching (PMW) and mukbang watching motivations. An online survey was administered to 604 adults (51% female; $M_{age}=24.29$ years; $SD=6.25$) who were mukbang watchers. Construct validity and convergent validity analyses indicated the Problematic Mukbang Watching Scale (PMWS) comprising three factors (i.e., denial, compulsion, and loss of control) and the Mukbang Watching Motives Scale (MWMS) comprising six factors (i.e., entertainment, sexual reasons, compensation, discovery, groupie reasons, and escape) had robust psychometric properties. Furthermore, PMW was positively associated with sexual, compensation, and escape motives for mukbang watching while controlling for daily time spent watching mukbang, daily number of different mukbang videos watched, and the total number of different mukbangers (i.e., the individuals in the broadcasts) regularly followed. Consequently, the present study contributes to the extant knowledge on the psychology of mukbang watching with two newly developed psychometrically robust assessment tools that can be used in future research.

1. Introduction

With the fast development and adoption of internet and smartphone technologies, increasing numbers of individuals worldwide engage in daily activities online (e.g., shopping, gambling, social networking). One such growing activity is watching *mukbang* (i.e., eating broadcasts) where mukbangers (i.e., individuals in the broadcasts) eat a large portion of food while interacting with the viewers (Kircaburun et al., 2021a). The origin of mukbang dates back to 2009 in South Korea and became widespread in Western countries by 2014 (Donnar, 2017), although the concept of mukbang has not been adequately studied academically. Nevertheless, mukbang is now one of the popular online activities that attracts hundreds of thousands of daily internet users worldwide (Kang et al., 2021; Kircaburun et al., 2021b; Nam and Jung, 2021; Stein and Yeo, 2021).

The growing popularity of mukbang watching has led researchers to investigate possible physical, psychological, and behavioural

consequences associated with mukbang watching among mukbang viewers. Various beneficial uses of watching mukbang have been described in different scientific fields, such as having a sense of communal eating and reducing feelings of loneliness and alienation, achieving virtual satiety for harmful food consumption without suffering physical health consequences, and obtaining entertainment and relaxation (Anjani et al., 2020; Bruno and Chung, 2017; Choe, 2019). Nevertheless, mukbang watching may be related to increased real-life food consumption, obesity, a variety of eating disorders, negative changes in eating and table manners, and harmful variation in the perception of the link between food consumption and thinness (Bruno and Chung, 2017; Donnar, 2017; Hong and Park, 2018; Kircaburun et al., 2021c; Spence et al., 2019).

Recently, a number of cross-sectional survey studies have drawn attention to the potential risk for transformation of recreational mukbang watching into a problematic (and possibly addictive) behaviour among emerging adult mukbang watchers (Kircaburun et al., 2021b,

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2021c, 2021d). In addition to the well-established mental, physical, and psychosocial impairments related to engagement in similar online problematic behaviours including problematic social media use and problematic binge-watching (Flayelle et al., 2019; Van den Eijnden et al., 2016), problematic mukbang watching (PMW) may further lead to stronger exposure to the aforementioned harmful effects of regular mukbang watching. Therefore, it is important to investigate the motivations that lead some individuals to losing control over their mukbang watching behaviour and becoming problematic mukbang watchers. However, to do so, reliable assessment tools are needed to carry out such research.

There is an ongoing debate in the behavioural addictions field on assessment criteria for problematic behaviours. Some scholars focus on the confirmatory approach while investigating problematic behaviours by applying the components model of addiction (e.g., Andreassen et al., 2012; Griffiths, 2005). Others claim that studies investigating problematic behaviours should focus on exploring the uniqueness of activities rather than aiming at identifying similarities with other addictions (Flayelle et al., 2019). Consequently, it might be better to mix a confirmatory approach while taking idiosyncrasies of behaviours into consideration. To date, and to the best of the authors' knowledge, there is only one psychometric scale that has been developed and validated to assess PMW (i.e., Mukbang Addiction Scale [MAS]; Kircaburun et al., 2021d). However, utilising the confirmatory approach, this scale was developed by replacing the Word 'Facebook' in the Bergen Facebook Addiction Scale (BFAS; Andreassen et al., 2012) with 'mukbang watching'. Moreover, the psychometric properties of MAS were only tested among a small number of Turkish university students. These limitations create a demand in the literature for newly developed scales to assess PMW by adopting different diagnostic criteria and using larger samples from different age groups and cultures.

Recently, some researchers have attempted to use different diagnostic criteria to assess problematic online behaviours. The Social Media Disorder Scale (SMDS; Van den Eijnden et al., 2016) was developed by adapting the official diagnostic criteria for internet gaming disorder in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association [APA], 2013) and applying them to social media use. The APA (2013) recommended that endorsing five of the nine criteria (i.e., preoccupation, tolerance, withdrawal, persistence, displacement, problems, deception, escape, conflict) over a one-year period is regarded as having risk for disordered use (Van den Eijnden et al., 2016). More recently, Flayelle et al. (2019) developed the Binge-Watching Engagement and Symptoms Questionnaire (BWESQ) based on the phenomenological study of television series watching in order to assess problematic binge-watching. Their scale comprised seven factors including loss of control, engagement, dependency, desire/savouring, positive emotions, binge-watching, and pleasure preservation (Flayelle et al., 2019).

According to the compensatory internet use model (Karddefelt-Winther, 2014), individuals use the internet to satisfy specific psychological, emotional, and physical needs. Therefore, in order to understand a specific online behaviour, underlying motivational factors should be examined (Karddefelt-Winther, 2014). The watching of mukbang videos can facilitate the (i) development of social connectedness with other viewers and mukbangers, (ii) vicarious satisfaction of eating without going through the negative consequences of consumption of desired high caloric food, (iii) sexual sensations of watching attractive individuals devour food, and (iv) sense of happiness and relief with auditory and visual stimuli (Anjani et al., 2020; Kircaburun et al., 2021a).

Research to date has indicated that virtual compensation of real-life eating, gaining social connectedness, and diminishing the feeling of loneliness by becoming part of a social mukbang community were the main motivations for higher engagement in mukbang watching (Bruno and Chung, 2017; Choe, 2019; Kircaburun et al., 2022). Furthermore, mukbang watching can also be engaged in for escaping from unpleasant

reality, entertainment, relaxation, and obtaining sexual gratification (Donnar, 2017; Kircaburun et al., 2021a; Woo, 2018). However, besides these reports from content analysis and qualitative interviews carried out in different fields, the psychology literature lacks a validated assessment tool to properly assess mukbang watching motivations. To the best of the present authors' knowledge, there is only one recent South Korean study that has attempted to empirically identify viewers' motives for mukbang watching. Lee and Yoon (2023) surveyed 462 adults, asking participants to rate 24 questions regarding mukbang watching motivations. The authors found that individuals watched mukbang for the pursuit of (i) mental and physical stability, (ii) entertainment, (iii) social relations, (iv) information, (v) vicarious satisfaction, and (vi) avoidance and killing time.

Therefore, the aim of the present study was to develop and validate two scales to assess both problematic mukbang watching and mukbang watching motives. Consequently, construct validity, reliability, and convergent validity for two newly developed scales were examined. These aforementioned properties were examined because they are some of the most important indicators to test and determine psychometric soundness of newly developed scales (Andreassen et al., 2012). More specifically, in terms of construct validity, exploratory and confirmatory factor analyses were used to examine factor structures; reliability tests were applied to investigate internal consistencies. Moreover, the relationships between the Mukbang Addiction Scale (MAS; Kircaburun et al., 2021d), PMW, and mukbang watching motivations were examined in order to determine convergent validity of the newly developed assessment tools, while taking mukbang watching behaviours into account (i.e., daily mukbang watching duration, daily average number of different mukbang videos watched, the number of mukbangers regularly followed). In terms of good convergent validity, significant positive correlations were expected between the MAS, PMW, mukbang watching motivations, and mukbang watching behaviours.

2. Methods

2.1. Participants and procedure

An online survey was conducted via *Prolific.co*, a crowdsourcing platform (similar to *Amazon Mechanical Turk*) where participants complete tasks assigned by researchers. Crowdsourced participant recruitment systems have been reported to be reliable and rapid sources for collecting cross-sectional data (Mortensen and Hughes, 2018). Participants were informed about the details of the study and it took approximately 10 minutes to complete the survey.

Participants were asked to indicate whether they were familiar with mukbang at the beginning of the survey. Those who answered 'no' to that question were eliminated from the study and were not compensated for their participation ($N = 78$). The final sample comprised 604 participants (51% female; $M_{age} = 24.29$ years; $SD = 6.25$) whose ages ranged between 18 and 64 years (see Table 1 for participant demographics). The sample was randomly divided into two independent subsamples via using SPSS software (following the steps: Analyze – Select cases – Random sample of cases – Approximately 50% of all cases) in order to conduct both exploratory factor analysis ($N = 325$, 54%) and confirmatory factor analysis ($N = 279$, 46%). Ethical approval for the study was provided by the research team's university's ethics committee and complied with the Helsinki declaration.

2.2. Measures

Demographic variables and mukbang watching: Questions relating to demographic characteristics of participants (i.e., gender, age and ethnicity), as well as the amount of daily time spent watching mukbang, daily number of different mukbang videos watched, and number of different mukbangers regularly followed were asked (see Table 1 for a detailed statistics). The number of female participants ($N = 307$, 50.8%)

Table 1
Participants' demographic characteristics and mukbang watching behaviour.

Variable	N	%
Gender		
Females	307	50.8
Males	291	48.2
Other	6	1.0
Ethnicity		
Caucasian	263	43.5
Black/African	167	27.6
Hispanic/Latino	135	22.4
Asian	22	3.6
Mixed	14	2.3
Daily time		
Rarely watch mukbang	300	49.7
Between 1 and 60 min	234	38.7
Between 61 and 120 min	43	7.1
Between 121 and 180 min	19	3.1
Between 181 and 240 min	6	1.0
Daily number of videos		
Rarely watch mukbang	309	51.2
1–2	221	36.6
3–5	57	9.4
6–8	10	1.7
More than 8	7	1.2
Number of mukbangers followed		
0	256	42.4
1–2	231	38.2
3–5	98	16.2
6–8	10	1.7
More than 8	9	1.5

was slightly higher than the males (N= 291, 48.2%). The majority of the participants were Caucasian (43.5%), following them Black/African (27.6%), Hispanic/Latino (22.4%), and Asian (3.6%). 38.7% of the participants spent between 1 and 60 min daily watching mukbang, whereas 7.1% spent between 61 and 120, and 3.1% between 121 and 180.

Problematic Mukbang Watching Scale (PMWS): The PMWS was developed for the present study to assess problematic mukbang watching (see Appendix A). The items were generated and formulated by the research team by adapting items from the Binge-watching Engagement and Symptoms Questionnaire (BWESQ; Flayelle et al., 2019) and Social Media Disorder Scale (SMDS; Van den Eijnden et al., 2016). The detailed statistics regarding the scale's psychometric properties are provided in the Results section.

Mukbang Watching Motives Scale (MWMS): The MWMS was developed for the present study to assess motivational factors of mukbang watching (see Appendix B). The items were generated and formulated by the research team by reviewing the existing evidence found in the literature (e.g., Kircaburun et al., 2021a). The detailed statistics regarding the scale's psychometric properties are provided in the Results section.

Mukbang Addiction Scale (MAS): The six-item MAS (Kircaburun et al., 2021d) was used to assess mukbang addiction (e.g., "How often in the last year have you felt an urge to watch mukbang more and more?") in order to test the convergent validity of MWMS and PMWS. The MAS was developed utilising the components model of addiction (Griffiths, 2005), which is a widely accepted and used model in the behavioural addictions field. Items were scored on a 5-point Likert scale (1=very rarely, 5=very often). Higher scores indicate greater risk of mukbang addiction (Cronbach's alpha [α]=.87; omega coefficient [Ω]=.88).

2.3. Statistical analysis

All statistical analyses were carried out using SPSS 23 and AMOS 24 software. First, demographic characteristics of participants (i.e., gender, age, ethnicity), and mukbang behaviour (i.e., daily time spent watching mukbang, daily number of different mukbang videos watched, and

number of different mukbangers regularly followed) were analysed using frequency and descriptive statistics. Second, EFA and CFA were used to assess the construct validity of MWMS and PMWS. Root mean square residuals (RMSEA), standardised root mean square residuals (SRMR), comparative fit index (CFI), and goodness of fit index (GFI) were checked to determine goodness of fit in CFA. RMSEA and SRMR lower than 0.05 and CFI and GFI higher than 0.95 indicate good fit whereas RMSEA and SRMR lower than 0.08 and CFI and GFI higher than 0.90 suggest adequate fit to the data (Hu and Bentler, 1999). Third, reliability was tested using Cronbach's alpha and omega coefficient (Hayes and Coutts, 2020). Fourth, Pearson's correlation and hierarchical regression analysis were used to assess convergent validity of MWMS and PMWS with other study variables.

3. Results

3.1. Problematic Mukbang Watching Scale (PMWS)

Exploratory factor analysis (N=325): EFA was utilised on the initially generated 18 items in order to determine the factor structure of the PMWS. Item 12 ("I occasionally fail to accomplish my daily tasks so I can watch mukbang more"), Item 17 ("I jeopardised my school or work performance due to watching mukbang"), and Item 10 ("I started losing interest and spending less time on watching TV series or movies because of my preference for watching mukbang") were excluded from the scale due to their high loadings on more than one factor. Consequently, the final PMWS comprised 15 items and three factors (i.e., compulsion, denial, loss of control) explaining 67.76% of the total variance.

Confirmatory factor analysis (N=279): In the first order CFA, the three-factor structure had an adequate fit to the data ($\chi^2 = 255.39$, $df = 85$, $p < .001$, RMSEA = 0.08 CI 90% [0.07, 0.10], SRMR = 0.05, CFI = 0.93, GFI = 0.90). Second order CFA showed that the scale can be used as a single construct ($\chi^2 = 213.35$, $df = 85$, $p < .001$, RMSEA = 0.07 CI 90% [0.06, 0.09], SRMR = 0.04, CFI = 0.95, GFI = 0.91). Mean scores, standard deviations, communalities produced in EFA, and standardised regression weights produced in CFA are shown in Table 2. The results indicated that the unidimensional PMWS had good construct validity and can be used to assess individuals' PMW.

Reliability analysis (N=604): The alpha coefficient of the 15-item PMWS was high ($\alpha = .93$). The omega coefficient was also high ($\Omega = .94$). As a result of EFA, CFA, and reliability tests, the PMWS was found to be valid and reliable for assessing individuals' PMW.

3.2. Mukbang Watching Motives Scale (MWMS)

Exploratory factor analysis (N=325): EFA was utilised on the initially generated 32 items in order to determine the factor structure of the MWMS. In the first attempt, three items (i.e., "I watch mukbang to see young attractive men/women", "I watch mukbang to have an eating companion", and "I watch mukbang because I love food") had high loadings on more than one factor. Therefore, these items were removed from further analysis. In the second and third attempts, two more items (i.e., "I watch mukbang to interact with other viewers" and "I watch mukbang to interact with the mukbangers") were removed for having high loadings on different factors. Consequently, 27 items comprising six factors (i.e. entertainment, sexual reasons, compensation, discovery, groupie reasons [i.e., watching mukbang only because their favorite YouTubers do it], escape), explaining 67.38% of the total variance, were obtained for further analysis.

Confirmatory factor analysis (N=279): In CFA, the six-factor solution produced an adequate fit to the data ($\chi^2 = 653.59$, $df = 309$, $p < .001$, RMSEA = 0.06 CI 90% [0.06, 0.07], SRMR = 0.06, CFI = 0.92, GFI = 0.85). Standardised factor loadings ranged between 0.58 and 0.92, and indicated all items had a significant role in the scale. Mean scores, standard deviations, communalities produced in EFA, and standardised regression weights produced in CFA are shown in Table 3. The results

Table 2

Mean scores, standard deviations, communalities, and standardised factor loadings of the PMWS items.

	Mean (Standard Deviation) (N = 604)	Exploratory factor analysis (N = 325)	Confirmatory factor analysis (N = 279)
		Communalities	Standardised factor loadings
<i>Loss of control</i>			
Item 6- I feel the need to watch mukbang for longer periods in order to feel satisfied.	1.53 (.91)	.69	.84
Item 8- I occasionally decide not to watch mukbang but eventually begin watching them again.	1.74 (1.02)	.59	.79
Item 5- I often spend more time on watching mukbang than I initially planned.	2.11 (1.22)	.67	.79
Item 7- I sometimes try to reduce the time I spend on watching mukbang but fail.	1.64 (1.01)	.58	.79
Item 11- I sometimes go to bed later than I should because I cannot stop watching mukbang.	1.70 (.97)	.68	.77
Item 2- I look forward to the time I will be able to watch a newly uploaded mukbang video.	1.89 (1.11)	.68	.75
Item 16- I try to forget about real life problems by watching mukbang.	1.75 (1.00)	.68	.71
Item 1- I sometimes think about mukbang videos I previously watched and/or plan the next time I will watch mukbang again.	1.84 (1.06)	.64	.69
Item 15- I sometimes watch mukbang to relieve a negative mood.	2.08 (1.11)	.65	.63
	Mean (Standard Deviation) (N = 604)	Exploratory factor analysis (N = 325)	Confirmatory factor analysis (N = 279)
		Communalities	Standardised factor loadings
<i>Compulsion</i>			
Item 9: I sometimes prefer watching mukbang rather than meeting friends or participate in hobbies that I used to enjoy before.	1.37 (.80)	.65	.78
Item 3: I am usually depressed or annoyed when I can't watch mukbang, and I feel better when I start watching mukbang.	1.30 (.69)	.69	.71
Item 4: I feel bad if I, for different reasons, cannot watch mukbang for a long period of time.	1.32 (.70)	.73	.68
Item 18: I risked losing a significant relationship due to watching mukbang.	1.06 (.28)	.52	.40
<i>Denial</i>			
Item 13: I tried to hide the time I spent on watching mukbang from my family.	1.40 (.90)	.86	.94
Item 14: I do not want my friends or other important people to know how much I watch mukbang.	1.52 (.99)	.86	.74

indicated that the MWMS had good construct validity and can be used to determine individuals' motivations for watching mukbang.

Reliability analysis (N=604): The alpha coefficients of mukbang watching motivations including entertainment (seven items; $\alpha=.91$), sexual reasons (four items; $\alpha=.76$), compensation (four items; $\alpha=.82$) discovery (three items; $\alpha=.86$), groupie reasons (four items; $\alpha=.85$), and escape (five items; $\alpha=.82$) were high. The omega coefficients of mukbang watching motivations including entertainment (seven items; $\Omega=.91$), sexual reasons (four items; $\Omega=.77$), compensation (four items; $\Omega=.83$) discovery (three items; $\Omega=.86$), groupie reasons (four items; $\Omega=.86$), and escape (five items; $\Omega=.82$) were high. As a result of EFA, CFA, and reliability tests, the 27-item MWMS was found to be valid and reliable for assessing individuals' mukbang watching motivations.

3.3. Convergent validity

Convergent validity of the PMWS and MWMS was assessed by testing their correlations with MAS and demographic variables (see Table 4). There were moderate and strong correlations among all subscales of PMWS and MWMS and the total mean score of PMWS with MAS. More specifically, global PMWS score was strongly correlated with the MAS ($r=.85$; $p<.001$), and loss of control ($r=.97$; $p<.001$) and compulsion ($r=.81$; $p<.001$) subfactors of PMWS, and moderately with all mukbang watching motivations assessed with MWMS including entertainment ($r=.64$; $p<.001$), sexual reasons ($r=.35$; $p<.001$), compensation ($r=.60$; $p<.001$), discovery ($r=.44$; $p<.001$), groupie reasons ($r=.43$; $p<.001$), escape ($r=.75$; $p<.001$), PMWS denial subfactor ($r=.68$; $p<.001$), daily time spent watching mukbang ($r=.56$; $p<.001$), daily number of mukbang videos watched ($r=.56$; $p<.001$), and number of mukbangers regularly followed ($r=.56$; $p<.001$). Being male was negatively weakly correlated with PMWS ($r=-.20$; $p<.001$) whereas age was not ($r=.03$; $p=.60$).

Furthermore, hierarchical regression analysis was also used to test convergent validity of the newly developed scales by including variables into a model that were significantly correlated with each other in the correlation analysis (see Table 5). In the first block, demographic variables were included into the model while mukbang watching motivations were regressed in the second block. Daily time spent watching mukbang ($\beta=.10$; $p<.01$), daily number of different mukbang videos watched ($\beta=.12$; $p<.01$), and number of mukbangers followed ($\beta=.09$; $p<.01$) were weakly positively associated with PMW assessed with PMWS. Moreover, while adjusting for the demographics, watching mukbang with motivations of escape (moderately [$\beta=.45$; $p<.001$]), real life eating compensation (weakly [$\beta=.16$; $p<.001$]), and sexual reasons (weakly [$\beta=.13$; $p<.001$]) were positively related to PMW. Entertainment ($\beta=.10$; $p=.07$), discovery ($\beta=.10$; $p=.15$), and groupie reason motives ($\beta=.10$; $p=.24$) of mukbang watching and being male ($\beta=.10$; $p=.52$) were not significantly associated with PMW.

4. Discussion

The purpose of the present study was to contribute to the extant knowledge on the psychology of mukbang watching by developing and validating two new scales – the Problematic Mukbang Watching Scale (PMWS) and the Mukbang Watching Motivation Scale MWMS – using construct validity and convergent validity. After reviewing the existing empirical evidence concerning problematic online behaviours and motives of mukbang watching, the present study examined the construct validity of the PMWS and MWMS by applying EFA and CFA using two independent sub-samples. Furthermore, convergent validity was also investigated by testing correlations between PMW, the MAS, dimensions of the MWMS, and mukbang watching behaviours. The results indicated that the PMWS and MWMS were valid and reliable instruments for assessing individuals' PMW and mukbang watching motivations

Table 3
Mean scores, standard deviations, communalities, and standardised factor loadings of the MWMS items.

	Mean (Standard Deviation) (N = 604)	Exploratory factor analysis (N = 325)	Confirmatory factor analysis (N = 279)
		Communalities	Standardised factor loadings
<i>Entertainment</i>			
Item 25: I watch mukbang because I enjoy it.	3.15 (1.37)	.78	.89
Item 18: I watch mukbang because it is entertaining.	3.11 (1.30)	.76	.89
Item 11: I watch mukbang to have fun.	2.98 (1.26)	.71	.85
Item 30: I watch mukbang because it relaxes me.	2.52 (1.28)	.69	.77
Item 3: I watch mukbang to escape from boredom.	2.84 (1.24)	.64	.73
Item 32: I watch mukbang when I have nothing better to do.	2.90 (1.22)	.66	.62
Item 4: I watch mukbang for recreation.	2.34 (1.17)	.39	.58
<i>Sexual reasons</i>			
Item 12: I watch mukbang as a sexual fantasy.	1.09 (.44)	.75	.79
Item 19: I watch mukbang because watching someone eat is sexually arousing.	1.11 (.46)	.71	.67
Item 26: I watch mukbang to fantasize that I am feeding someone.	1.14 (.50)	.53	.65
Item 31: I watch mukbang videos of people that I feel sexually attracted to.	1.22 (.63)	.56	.59
<i>Compensation</i>			
Item 8: I watch mukbang to compensate for my hunger.	1.77 (1.10)	.77	.85
Item 15: I watch mukbang to satisfy my cravings for different food that I am not allowed to eat.	1.90 (1.21)	.68	.78
Item 1: I watch mukbang to have a virtual satisfaction of eating.	2.22 (1.15)	.62	.76
Item 28: I watch mukbang to avoid actual eating.	1.41 (.86)	.67	.55
	Mean (Standard Deviation) (N = 604)	Exploratory factor analysis (N = 325)	Confirmatory factor analysis (N = 279)
		Communalities	Standardised factor loadings
<i>Discovery</i>			
Item 20: I watch mukbang to find out about new food products.	2.63 (1.24)	.78	.87
Item 13: I watch mukbang to discover novel foods from different cultures.	2.82 (1.27)	.77	.81
Item 6: I watch mukbang to learn about new recipes.	2.46 (1.22)	.73	.77
<i>Groupie reasons</i>			
Item 14: I watch mukbang so that I can see and listen to my favorite <i>YouTubers</i> .	2.23 (1.26)	.86	.92
Item 7: I watch mukbang only because my favorite <i>YouTubers</i> make them.	2.14 (1.24)	.81	.86
Item 27: I watch mukbang so that I can listen to what mukbangers have to tell.	2.36 (1.29)	.64	.76
Item 21: I watch mukbang but I am more focused on the mukbanger than the food.	1.99 (1.11)	.50	.64
<i>Escape</i>			
Item 17: I watch mukbang to get away from the daily hassles.	1.96 (1.07)	.67	.77
Item 10: I watch mukbang to forget about my problems.	1.82 (1.03)	.72	.73
Item 24: I watch mukbang to avoid my unpleasant reality.	1.57 (.91)	.72	.70
Item 23: I watch mukbang to be part of an online social community.	1.57 (.89)	.54	.60
Item 2: I watch mukbang to feel less lonely.	1.76 (1.02)	.54	.58

Table 4
Mean scores, standard deviations, and Pearson's correlations of the study variables (N=604).

	1	2	3	4	5	6	7	8	9	10	11
1. MAS	-										
2. PMWS-Total	.85**	-									
3. PMWS-Denial	.54**	.68**	-								
4. PMWS-Compulsion	.75**	.81**	.52**	-							
5. PMWS-Loss of control	.82**	.97**	.54**	.70**	-						
6. MWMS-Entertainment	.48**	.64**	.31**	.37**	.69**	-					
7. MWMS-Sexual	.33**	.35**	.30**	.35**	.31**	.17**	-				
8. MWMS-Compensation	.48**	.60**	.38**	.44**	.60**	.53**	.21**	-			
9. MWMS-Discovery	.33**	.44**	.19**	.31**	.47**	.58**	.11*	.38**	-		
10. MWMS-Groupie	.37**	.43**	.22**	.31**	.44**	.56**	.14*	.24**	.34**	-	
11. MWMS-Escape	.66**	.75**	.47**	.57**	.74**	.64**	.28**	.54**	.38**	.50**	-
12. Age	-.05	-.03	.00	-.02	-.03	-.01	-.07	.02	-.02	-.09	-.00
13. Being male	-.17**	-.20**	-.03	-.14*	-.22**	-.24**	.08	-.24**	-.19**	-.25**	-.23**
14. Daily time spent	.49**	.56**	.28**	.40**	.59**	.53**	.14*	.41**	.41**	.43**	.47**
15. Daily number of videos	.47**	.56**	.26**	.37**	.60**	.58**	.14**	.41**	.42**	.39**	.42**
16. Mukbangers followed	.48**	.56**	.25**	.38**	.59**	.59**	.16**	.40**	.44**	.49**	.45**
Mean	1.42	1.62	1.46	1.26	1.81	2.83	1.14	1.83	2.64	2.18	1.73
Standard deviation	.63	.67	.88	.49	.83	1.01	.39	.87	1.10	1.02	.75

Note. MAS=Mukbang Addiction Scale; PMWS=Problematic Mukbang Watching Scale; MWMS=Mukbang Watching Motives Scale.

* $p < .01$, ** $p < .001$.

Table 5
Hierarchical regression analysis predicting problematic mukbang watching (N = 604).

Model	B	SE	β	t	ΔR^2
Block 1 ($R^2_{\text{adjusted}} = .41$; $F_{(4,599)} = 103.79$; $p < .001$)					.41
Being male	.02	.03	.02	.62	
Daily time spent	.07	.03	.10	2.81*	
Daily number of videos watched	.10	.03	.12	3.31*	
Mukbangers followed	.07	.03	.09	2.75*	
Block 2 ($R^2_{\text{adjusted}} = .69$; $F_{(10,593)} = 132.26$; $p < .001$)					.28
MWMS-Entertainment	.04	.03	.07	1.68	
MWMS-Sexual	.23	.04	.13	5.42**	
MWMS-Compensation	.12	.02	.16	5.43**	
MWMS-Discovery	.03	.02	.04	1.45	
MWMS-Groupie	-.02	.02	-.04	-1.16	
MWMS-Escape	.40	.03	.45	13.35**	

Note. B = unstandardized regression coefficient; SE = Standard error; β = standardised regression coefficient; MWMS = Mukbang Watching Motives Scale; * $p < .01$, ** $p < .001$.

respectively.

CFA indicated PMW symptoms included denial, compulsion, and loss of control related to mukbang watchers' engagement in mukbang watching behaviour. However, second order CFA showed the PMWS could be used as a unidimensional construct to assess global PMW by presenting good fit and solid construct validity. It appears problematic users of mukbang watching experienced problems in controlling their mukbang watching behaviour due to the increased compulsive urges that lead them to excessive engagement. Two items represented the denial component which indicated those with greater PMW tried to hide their mukbang watching from their friends, families, and/or loved ones. Consequently, the PMWS shared common constructs and symptoms with the (i) MAS which used the components model of addiction to develop its scale items (Griffiths, 2005), (ii) SMDS which was developed by adapting the official diagnostic criteria of gaming disorder (Van den Eijnden et al., 2016), and (iii) BWESQ which comprised symptoms including engagement, positive emotions, desire/savouring, pleasure preservation, binge-watching, dependency, and loss of control (Flayelle et al., 2019). However, it should be noted that the mean scores of items were relatively at average and low levels. Also, the lack of components associated with having real life problems due to PMW may indicate that the present sample's PMW may not be indicative of addiction *per se* (Griffiths, 2005), but more of a problematic and risky use that may become an addiction in the future.

Construct validity analyses indicated a six-factor model for the MWMS with robust psychometric results and fit scores. CFA confirmed the MWMS comprised six motives including compensation (e.g., real life eating and satiation), entertainment, sexual reasons, escape (e.g., from mental and real life problems), discovery (e.g., different foods and recipes), and groupie reasons (e.g., watching and listening to their favourite *YouTubers*). Only the social motive was eliminated from the initial theorised group of mukbang watching motivations after analyses. However, it should be noted that this elimination was only because of the analytic results (i.e., social motives loading on more than one factor), and that social motives remain important. The extant literature suggested that one of the most important motivations for watching mukbang was to interact with mukbangers and other viewers in order to feel less lonely, to have an eating companion, and to feel part of an online social community (Kircaburun et al., 2021a). However, this may be because items relating to watching mukbang to feel less lonely and part of an online social community were included into the escape motive after construct validity analyses. It appears that participants used mukbang watching as an avoidance activity that helps them ignore unpleasant psychosocial feelings (e.g., loneliness) rather than a recreational social activity that enables social interaction.

The present study's findings regarding the motivations for mukbang watching were mostly in line with a recent study that was conducted

with South Korean adults (i.e., Lee and Yoon, 2023). More specifically, entertainment, eating compensation, escape, and discovery motives found in the present study were similar to the pursuit of (i) entertainment, (ii) vicarious satisfaction, (iii) avoidance and killing time, and (iv) information identified in the South Korean study. However, there were slight differences between the present study and the aforementioned study. For instance, the present study included sexual reasons for watching mukbang whereas Lee and Yoon (2023) identified that some viewers watched mukbang for the pursuit of mental and physical stability. Therefore, there may be some cultural differences in terms of mukbang watching motivations that should be further examined and identified in future studies including the further cultural testing of the psychometric scales developed in the present study.

Convergent validity was tested for the newly developed assessment instruments by examining the correlational relationships between variables. In line with study expectations and the notion that the usage behaviours of specific online activities are highly consistent predictors of problematic use of those activities (Griffiths et al., 2014), mukbang watching behaviours were positively related to PMW in both correlation analysis and the regression model. Moreover, all mukbang watching behaviours were positively associated with mukbang watching motives ranging from weak to moderate. Consequently, PMW was positively related to mukbang watching motives of escape, compensation, and sexual reasons, while controlling for mukbang watching behaviours including daily mukbang watching duration, daily number of different mukbang videos watched, and the number of mukbangers regularly followed.

Escape motive being the strongest predictor of PMW was in line with previous studies in behavioural addictions literature reporting that individuals' motivation for escaping their reality and negative mental state was an important indicator of their elevated engagement in other online problematic behaviours including internet gaming disorder (Marino et al., 2020), internet addiction (Yang et al., 2021), and problematic binge-watching (Starosta et al., 2020). Watching mukbang with the motivation of compensating real life eating was the second strongest predictor of PMW after escape. This was consistent with the notion that the important part of PMW is the extension of real life eating and food consumption problems (e.g., food addiction, eating disorders) into online platforms (Kircaburun et al., 2022). It may be that those who successfully replace their real life eating with virtual eating by obtaining the vicarious satiation from watching mukbang (e.g., those with anorexia and/or binge-eating disorder) become uncontrolled, excessive, and compulsive mukbang watchers. Finally, the unexpected finding of sexual motives being a significant predictor of PMW may be explained by the fact that mukbangers who are young and sexually attractive have the highest numbers of regular followers and viewers (Kircaburun et al., 2021a). Some viewers (typically males) successfully obtain sexual pleasure from watching attractive young individuals (typically females) devour food in front of them appear to become problematic mukbang watchers (Kircaburun et al., 2021a). Given that there are a very high number of sexual sensations and online sexual stimuli are potentially addictive (Hermand et al., 2020), some viewers may have perceived them as mukbang sexual videos rather than watching them for fulfilling their eating and social needs.

4.1. Limitations

Several limitations to the present study should be emphasised while interpreting the present study's results. First, Caucasian, Hispanic/Latino, and Black/African participants comprised the large majority of the present sample. Existing cross-cultural studies suggest that mukbang watching attitudes and motives may vary across cultures (Pereira et al., 2019). Future studies should try to recruit more equally distributed samples from different ethnicities around the world so that the findings can be replicated with more representative study groups. Existing cross-cultural studies suggest that mukbang watching attitudes and

motives may vary across cultures (Pereira et al., 2019). Second, the cross-sectional survey used in the present study prevents examination of the directions of the relationships reported here. Future studies should adopt more in-depth methods to investigate PMW and mukbang watching motives by using longitudinal designs to investigate any causal associations. Third, self-report online surveys used in the present study are prone to having specific biases including memory recall, random responses, and social desirability. Future studies should use more in-depth data collection techniques including qualitative interviews.

4.2. Conclusion

Despite the aforementioned limitations, the present study contributes to the existing online behavioural addictions literature by developing and validating two new psychometric assessment instruments that are valid and reliable for assessing problematic mukbang watching and mukbang watching motives among adult mukbang watchers. Furthermore, the present study also makes an important contribution in understanding the underlying motivational factors associated with elevated PMW. The psychometric properties of the newly developed scales in the present study and the aforementioned associations between

the study constructs should be tested by translating these scales into different languages and cultures before developing any intervention strategies for PMW.

Author statement

The authors confirm contribution to the paper as follows: study conception and design: KK, MG, AH, FC; data collection: KK; analysis and interpretation of results: KK, MG, AH, FC; draft manuscript preparation: KK, MG, AH, FC. All authors reviewed the results and approved the final version of the manuscript.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Problematic Mukbang Watching Scale (PMWS)

	1= Never	2= Rarely	3= Sometimes	4= Often	5= Always
1. I sometimes think about mukbang videos I previously watched and/or plan the next time I will watch mukbang again.	1	2	3	4	5
2. I look forward to the time I will be able to watch a newly uploaded mukbang video.	1	2	3	4	5
3. I am usually depressed or annoyed when I can't watch mukbang, and I feel better when I start watching mukbang.	1	2	3	4	5
4. I feel bad if I, for different reasons, cannot watch mukbang for a long period of time.	1	2	3	4	5
5. I often spend more time on watching mukbang than I initially planned.	1	2	3	4	5
6. I feel the need to watch mukbang for longer periods in order to feel satisfied.	1	2	3	4	5
7. I sometimes try to reduce the time I spend on watching mukbang but fail.	1	2	3	4	5
8. I occasionally decide not to watch mukbang but eventually begin watching them again.	1	2	3	4	5
9. I sometimes prefer watching mukbang rather than meeting friends or participate in hobbies that I used to enjoy before.	1	2	3	4	5
10. I sometimes go to bed later than I should because I cannot stop watching mukbang.	1	2	3	4	5
11. I tried to hide the time I spent on watching mukbang from my family.	1	2	3	4	5
12. I do not want my friends or other important people to know how much I watch mukbang.	1	2	3	4	5
13. I sometimes watch mukbang to relieve a negative mood.	1	2	3	4	5
14. I try to forget about real life problems by watching mukbang.	1	2	3	4	5
15. I risked losing a significant relationship due to watching mukbang.	1	2	3	4	5

Denial: 11,12; Compulsion: 3,4,9,15; Loss of control: 1,2,5,6,7,8,10,13,14.

Appendix B. Motives For Watching Mukbang Scale (MWMS)

	1= Never	2= Rarely	3= Sometimes	4= Often	5= Always
1. I watch mukbang to have a virtual satisfaction of eating.	1	2	3	4	5
2. I watch mukbang to feel less lonely.	1	2	3	4	5
3. I watch mukbang to escape from boredom.	1	2	3	4	5
4. I watch mukbang for recreation.	1	2	3	4	5
5. I watch mukbang to learn about new recipes.	1	2	3	4	5
6. I watch mukbang only because my favorite <i>YouTubers</i> make them.	1	2	3	4	5
7. I watch mukbang to compensate for my hunger.	1	2	3	4	5
8. I watch mukbang to forget about my problems.	1	2	3	4	5
9. I watch mukbang to have fun.	1	2	3	4	5
10. I watch mukbang as a sexual fantasy.	1	2	3	4	5
11. I watch mukbang to discover novel foods from different cultures.	1	2	3	4	5
12. I watch mukbang so that I can see and listen to my favorite <i>YouTubers</i> .	1	2	3	4	5
13. I watch mukbang to satisfy my cravings for different food that I am not allowed to eat.	1	2	3	4	5
14. I watch mukbang to get away from the daily hassles.	1	2	3	4	5
15. I watch mukbang because it is entertaining.	1	2	3	4	5
16. I watch mukbang because watching someone eat is sexually arousing.	1	2	3	4	5
17. I watch mukbang to find out about new food products.	1	2	3	4	5
18. I watch mukbang but I am more focused on the mukbanger than the food.	1	2	3	4	5
19. I watch mukbang to be part of an online social community.	1	2	3	4	5
20. I watch mukbang to avoid my unpleasant reality.	1	2	3	4	5
21. I watch mukbang because I enjoy it.	1	2	3	4	5
22. I watch mukbang to fantasize that I am feeding someone.	1	2	3	4	5
23. I watch mukbang so that I can listen to what mukbangers have to tell.	1	2	3	4	5

(continued on next page)

(continued)

	1= Never	2= Rarely	3= Sometimes	4= Often	5= Always
24. I watch mukbang to avoid actual eating.	1	2	3	4	5
25. I watch mukbang because it relaxes me.	1	2	3	4	5
26. I watch mukbang videos of people that I feel sexually attracted to.	1	2	3	4	5
27. I watch mukbang when I have nothing better to do.	1	2	3	4	5

Entertainment: 3,4,9,15,21,25,27; Sexual reasons: 10,16,22,26; Compensation: 1,7,13,24; Discovery: 5,11,17; Groupie reasons: 6,12,18,23; Escape: 2,8,14,19,20.

References

- American Psychiatric Association, A., 2013. *Diagnostic and Statistical Manual of Mental Disorders, fifth ed.* American Psychiatric Association, Arlington, VA.
- Andreassen, C.S., Torsheim, T., Brunborg, G.S., Pallesen, S., 2012. Development of a Facebook addiction scale. *Psychol. Rep.* 110 (2), 501–517. <https://doi.org/10.2466/02.09.18.PR0.110.2.501-517>.
- Anjani, L., Mok, T., Tang, A., Oehlberg, L., Boon, G.W., 2020. Why do people watch others eat? An empirical study on the motivations and practices of mukbang viewers. In: CHI 2020: Proceedings of the 2020 SIGCHI Conference on Human Factors in Computing Systems from: <http://hicitang.org/papers/2020-chi2020-mukbang.pdf>. (Accessed 14 December 2021).
- Bruno, A.L., Chung, S., 2017. Mōk pang: pay me and I'll show you how much I can eat for your pleasure. *Journal of Japanese and Korean Cinema* 9 (2), 155–171. <https://doi.org/10.1080/17564905.2017.1368150>.
- Choe, H., 2019. Eating together multimodally: collaborative eating in mukbang, a Korean livestream of eating. *Lang. Soc.* 48 (2), 171–208. <https://doi.org/10.1017/S0047404518001355>.
- Donnar, G., 2017. 'Food porn' or intimate sociality: committed celebrity and cultural performances of overeating in meokbang. *Celebr. Stud.* 8, 122–127. <https://doi.org/10.1080/19392397.2016.1272857>.
- Flayelle, M., Canale, N., Vögele, C., Karila, L., Maurage, P., Billieux, J., 2019. Assessing binge-watching behaviors: development and validation of the "watching TV series motives" and "binge-watching engagement and symptoms" questionnaires. *Comput. Hum. Behav.* 90, 26–36. <https://doi.org/10.1016/j.chb.2018.08.022>.
- Griffiths, M., 2005. A 'components' model of addiction within a biopsychosocial framework. *J. Subst. Use* 10, 191–197. <https://doi.org/10.1080/1465980500114359>.
- Griffiths, M.D., Kuss, D.J., Demetrovics, Z., 2014. Social networking addiction: an overview of preliminary findings. In: Rosenberg, K., Feder, L. (Eds.), *Behavioral Addictions: Criteria, Evidence and Treatment*. Elsevier, New York, pp. 119–141.
- Hayes, A.F., Coutts, J.J., 2020. Use omega rather than Cronbach's alpha for estimating reliability. *But. Commun. Methods Meas.* 14 (1), 1–24. <https://doi.org/10.1080/19312458.2020.1718629>.
- Hermand, M., Benyamina, A., Donnadieu-Rigole, H., Petillion, A., Amirouche, A., Roméo, B., Karila, L., 2020. Addictive use of online sexual activities and its comorbidities: a systematic review. *Current Addiction Reports* 7 (2), 194–209. <https://doi.org/10.1007/s40429-020-00301-3>.
- Hong, S.K., Park, S., 2018. Internet mukbang (foodcasting) in South Korea. In: Elea, L., Mikos, L. (Eds.), *Young and Creative: Digital Technologies Empowering Children in Everyday Life*. Nordicom, Göteborg, pp. 111–125.
- Hu, L.T., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.* 6 (1), 1–55. <https://doi.org/10.1080/10705519909540118>.
- Kang, H., Yun, S., Lee, H., 2021. Dietary life and mukbang-and cookbang-watching status of university students majoring in food and nutrition before and after COVID-19 outbreak. *J. Nutr. Health* 54 (1), 104–115. <https://doi.org/10.4163/jnh.2021.54.1.104>.
- Kardefelt-Winther, D., 2014. A conceptual and methodological critique of internet addiction research: towards a model of compensatory internet use. *Comput. Hum. Behav.* 31, 351–354. <https://doi.org/10.1016/j.chb.2013.10.059>.
- Kircaburun, K., Harris, A., Calado, F., Griffiths, M.D., 2021a. The psychology of mukbang watching: a scoping review of the academic and non-academic literature. *Int. J. Ment. Health Addiction* 19, 1190–1213. <https://doi.org/10.1007/s11469-019-00211-0>.
- Kircaburun, K., Balta, S., Emirtekin, E., Tosuntas, Ş.B., Demetrovics, Z., Griffiths, M.D., 2021b. Compensatory usage of the internet: the case of mukbang watching on YouTube. *Psychiatry Investigation* 18, 269–276. <https://doi.org/10.30773/pi.2019.0340>.
- Kircaburun, K., Savci, M., Emirtekin, E., Griffiths, M.D., 2022. Uses and gratifications of problematic mukbang watching – the role of eating and social gratification: a pilot study. *J. Psychiatr. Res.* 146, 28–30. <https://doi.org/10.1016/j.jpsychires.2021.12.036>.
- Kircaburun, K., Yurdağül, C., Kuss, D., Emirtekin, E., Griffiths, M.D., 2021c. Problematic mukbang watching and its relationship to disordered eating and internet addiction: a pilot study among emerging adult mukbang watchers. *Int. J. Ment. Health Addiction* 19, 2160–2169. <https://doi.org/10.1007/s11469-020-00309-w>.
- Kircaburun, K., Stavropoulos, V., Harris, A., Calado, F., Emirtekin, E., Griffiths, M.D., 2021d. Development and validation of the mukbang addiction scale. *Int. J. Ment. Health Addiction* 19, 1031–1044. <https://doi.org/10.1007/s11469-019-00210-1>.
- Lee, J., Yoon, H., 2023. Development and validation of the mukbang watching motivation scale. *Journal of the Korean Psychological Association: Consumer and Advertising* 24 (1), 25–55. <https://doi.org/10.21074/kjcap.2023.24.1.25>.
- Marino, C., Canale, N., Vieno, A., Caselli, G., Scacchi, L., Spada, M.M., 2020. Social anxiety and internet gaming disorder: the role of motives and metacognitions. *Journal of Behavioral Addictions* 9 (3), 617–628. <https://doi.org/10.1556/2006.2020.00044>.
- Mortensen, K., Hughes, T.L., 2018. Comparing Amazon's Mechanical Turk platform to conventional data collection methods in the health and medical research literature. *J. Gen. Intern. Med.* 33, 533–538. <https://doi.org/10.1007/s11606-017-4246-0>.
- Nam, H.Y., Jung, B.M., 2021. A comparative study of the dietary behavior of adults aged 20 and over according to the mukbang viewing time. *Korean Journal of Community Nutrition* 26 (2), 93–102. <https://doi.org/10.5720/kjcn.2021.26.2.93>.
- Pereira, B., Sung, B., Lee, S., 2019. I like watching other people eat: a cross-cultural analysis of the antecedents of attitudes towards Mukbang. *Australas. Market J.* 27 (2), 78–90. <https://doi.org/10.1016/j.ausmj.2019.03.001>.
- Spence, C., Mancini, M., Huisman, G., 2019. Digital commensality: eating and drinking in the company of technology. *Front. Psychol.* 10, 2252. <https://doi.org/10.3389/fpsyg.2019.02252>.
- Starosta, J., Izydorczyk, B., Dobrowolska, M., 2020. Personality traits and motivation as factors associated with symptoms of problematic binge-watching. *Sustainability* 12 (14), 5810. <https://doi.org/10.3390/su12145810>.
- Stein, J.P., Yeo, J., 2021. Investigating Meal-concurrent Media Use: Social and Dispositional Predictors, Intercultural Differences, and the Novel Media Phenomenon of "Mukbang" Eating Broadcasts. *Human Behavior And Emerging Technologies*. Advance online publication. <https://doi.org/10.1002/hbe2.306>.
- Van den Eijnden, R.J., Lemmens, J.S., Valkenburg, P.M., 2016. The social media disorder scale. *Comput. Hum. Behav.* 61, 478–487. <https://doi.org/10.1016/j.chb.2016.03.038>.
- Woo, S., 2018. Mukbang is changing digital communications. *Anthropol. News* 59 (6), e90–e94. <https://doi.org/10.1111/AN.1048>.
- Yang, W., Morita, N., Ogai, Y., Saito, T., Hu, W., 2021. Associations between sense of coherence, psychological distress, escape motivation of internet use, and internet addiction among Chinese college students: a structural equation model. *Curr. Psychol.* <https://doi.org/10.1007/s12144-021-02257-7>. Advance online publication.