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ORIGINAL PAPER

Development and Validation of a Near Miss Scale for Assessing Gambling Tendency

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Abstract
Although near-miss is an important tendency indicator for gambling addiction, no scale has been developed to evaluate these feelings. In this study, the aim is to develop a Near Miss Scale (NMS) to assess the tendency of gambling. In the first step, a 38-item measurement tool was prepared by the first author, which was examined by 8 experts. According to their comments and opinions, a 32-item 5-point Likert-type pre-form was created. The study was conducted with 600 gamblers in Northern Cyprus between December 2018-March 2019 and data from 563 of them were included in the statistical analysis. In the questionnaire, Socio-demographic form, Gambling Craving Scale (GCS), South Oaks Gambling Screening Test (SOGST) and NMS were used. With the SPSS 23 and R Studio statistical programs, after calculating the item-total correlations of the items in the NMS form, items with low item total-correlation values were excluded from the scale and 30 items were analysed statistically. In the study, it was seen that the factor loads of the relevant items in NMS were between .715 and .896. Confirmatory factor analysis (CFA) showed that a single factor model in the scale was valid. NMS had a positive correlation with SOGST (r = 0.601) and GCS (r = 0.752). The 2-week test–retest results of NMS with a Cronbach alpha of 0.981 were determined as 0.972. The validity and reliability results suggest that NMS is a valid and reliable as 30-item, one-dimensional measurement tool for assessing gambling tendency among gamblers.

Keywords Gambling addiction · Tendency · Near-miss · Scale development

Introduction

Near Miss (NM) is described as "a kind of special failure in a person close to being successful in achieving a goal" and is known to encourage and condition gamblers (Clark, 2014; Reid, 1986). The gambling industry adjusts some of the games according to the

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NM senses and this can motivate the players to gamble more (Wu et al., 2015; Zhang & Covey, 2014). NM creates part of the excitement of winning. As such, the player is not constantly losing, only continually returning to the threshold of winning (Catania, 2003; Parke & Griffiths, 2004). Although NM leads to a loss of money, it gives players a sensation of winning and ensures that they keep playing. As the NM sensation is created, the player is kept in the game (Parke & Griffiths, 2004). Despite losing a significant amount of money in the game, the player will continue to play the game even though he/she feels a sense of disappointment (Stange et al., 2016). The results of NM losses are reported to produce more frustrating outcomes compared to other losses without the NM feature (Stange et al., 2017). Compared to complete loss, the increase in physiological stimulation, despite its frustration, affects the desire to continue gambling, which leads to an increase in gambling behaviour (Clark et al., 2012). When the NM emotions are combined with the games played that the player could control and the interpretative bias (Amazue et al., 2021), it is reported that there is a tendency to gamble more intensely as supported by neurobiological findings (Clark et al., 2009). These psychological and neurobiological linkages are found to be between gambling addiction and substance abuse disorders (Li et al., 2020; Potenza, 2006).

Classically, it is reported that NM outcomes are related to an increase in the drive to play and insistent gambling and that these behaviours increase the tendency to gamble (Clark et al., 2009; Côte´ et al., 2003). Individuals with gambling disorders have greater sensitivity to NM outcomes (Chase & Clark, 2010; Habib & Dixon, 2010; Sescousse et al., 2016). NM emotions lead to an 'almost winning' excitement when the player loses (Sharman et al., 2015). The person who loses during a game feels that he/she is close to winning, which causes disappointment and cognitive regret (Griffiths, 1990). These feelings of frustration and regret combined with the feeling of NM allow the game to be played again (Dixon et al., 2013). The feeling of regret is eliminated by re-playing and this encourages the individual to play the next game. The more NM content is added in a game, the more gambling is played (Griffiths, 1990; Sundali et al., 2012; Stange & Dixon, 2020).

It can be said that gambling behaviour is a function of past reinforcements (Catania, 2003). The reason why the gambler is addicted is because of the prizes given to him/her during the game. These reinforcements can be financial such as gaining money, physiological such as a feeling of excitement precipitated by adrenaline, psychological reasons such as increased self-esteem and prestige, and psychosocial factors such as the social meaning of the event (Griffiths, 1999;). Every step and environmental stimulus during the game increases the tension and excitement. The basis of gambling behaviour is the continuation of win or loss experiences in a transactional conditioning paradigm (Parke & Griffiths, 2004). With respect to NM, positive and hedonic values emerge, and despite the monetary losses, the brain reward circuit operates. It has been reported that the functioning of the brain reward circuit increases gambling behaviour despite monetary loss (Clark et al., 2009). All these characteristics of NM emotions enables the gambler to maintain his/her gambling behaviour and structurally increase his/her addiction to the game (Parke & Griffiths, 2004).

NM features seem to be an important risk factor in the development of gambling addiction (Meyer et al., 2011). In the formation of gambling addiction, Near Misses fuel the continuation of gambling behaviour and lead to more intensive play (Chase & Clark, 2010). It is even more motivating when compared to the feelings of big winners (Kassinove & Schare, 2001). Physiological excitement, the brain reward system, and motivation enhance the tendency to gamble (Clark et al., 2009). NM feelings are reported to be associated with

gambling severity for both non-problem gamblers and gambling addicts (Chase & Clark, 2010). It has also been observed that problem gamblers are more reactive towards NM (Billieux et al., 2012; Dymond et al., 2014). NM emotions for gambling addicts can be regarded as encouraging signs that their strategy has been approved and leads to increased hopes for their future success (Parke & Griffiths, 2004).

Statement of the Problem

It is possible to monitor the development of individuals who gamble and also to determine the severity of the addiction of pathological gamblers by examining their tendency to gamble. Although the NM outcomes are the most important determinant of the tendency to gamble, there is no known measurement tool that is aimed to evaluate the NM feelings for gamblers. In this study, it is aimed to develop a tool to define the level of gambling tendency in individuals by developing an NM scale.

Method

Participants

Participants (n = 563) who gamble one or more times a week at the Casino and Betting Offices in North Cyprus (78.9% male and 21.1% female) were determined by convenience sampling and were invited to participate on a voluntary basis. The age of participants were between 18 and 83 years and 60.9% of the participants were single. The mean age was 31.8 years (SD = 10.3 years). Test–retest applications of the scale were administered to 75 gamblers at two-week intervals.

Procedure

Firstly, ethical permission was obtained from the ethics committee in The Near East University with the reference number of YDÜ/SB/2019/517. The study purpose was to develop items determining the level of gambling tendency in individuals. A scale development study was carried out at the Pembe Kosk Psychiatric Hospital, the only addiction centre in Northern Cyprus. In the process of writing the scale items and creating the trial form as a data collection tool, the literature related to the NMS was primarily examined. In the study, the concept of Near Miss is defined as a specific type of failure that creates the feeling of "I was just winning" in order to achieve a goal close to success. In the formation of the questionnaire, the participants' near-miss experiences in casinos, which increase their tendency to gamble both at the casino and outside the casino, were examined. Afterwards, in the clinic, the first author conducted one-on-one interviews with 50 gambling addicts in order to learn their thoughts, feelings, memories about NM, and a 38-item NMS form was subsequently prepared from 01 September 2019 to 30 November 2019.

The opinions of 8 experts, including 2 measurement and evaluation specialists, 2 from the field of Psychiatry and 4 from the discipline Clinical Psychology were sought to evaluate the clarity, necessity, and specificity of the questions of the trial form. Some items were removed from the scale according to the expert opinions while others were revised. A detailed expert opinion form was created for this purpose. After conducting qualitative

analysis in the trial form, the trial form was designed with a total of 30 items. Each question in the form took the form of a five-point Likert type, with possible answers including 'always (5)', 'most of the time (4)', 'sometimes (3)', 'exceedingly rare (2)' and 'never (1)'. No items in the scale were reverse scored. The total score was calculated by adding the values taken from the 30 items. As the total score gets higher, the gambling tendency will increase too.

Assessment Measures

To determine the criterion validity of the NMS, the Socio-demographic Form (SF), Gambling Craving Scale (GCS) and South Oaks Gambling Screen (SOGS) with the Near-Miss Scale (NMS) were used.

SF

The SF was created by the researchers to obtain information about the participants and the form consists of questions on personal information like gender, age, education level, ethnicity, employment status, marital status and gambling playing attitudes.

GCS

GCS was developed by Young and Wohl in 2009 and it is a valid and reliable scale in Turkish (Buran, Çakıcı, Çakır & Yılmaz, 2019). The scale is aimed at measuring the gambling-related craving of gamblers and consists of 8 items. The internal consistency of the scale was determined to be 0.959 in the Turkish validity study.

SOGS

SOGS is a 20-item scale which was developed by Lesieur and Blume (1987) and the Turkish validity and reliability study was performed by Duvarcı and Varan (2001). The aim of the scale is to identify pathological gamblers. The internal consistency of the scale was calculated as 0.8772.

This questionnaire was administered by a team of 3 clinical psychologists between December 2018 and March 2019. The researchers ensured that the responses remained confidential, and identification codes were used rather than names.

Data Analysis

SPSS 23 and R Studio software statistical package programs were used for the analysis. In the analysis of the data, univariate followed by multivariate data analyses were performed. In these analyses, observations that were not considered appropriate were excluded from the study. It was then analysed using Explanatory Factor Analysis (EFA) to explore the validity of construct validity of the characteristics of NMS applied to gamblers. Furthermore, Confirmatory Factor Analysis (CFA) was conducted to check the factor structure as well as to determine the adequacy of the factor structure established during EFA. Criterion-related validity (concurrent validity) was assessed by using bivariate correlations between NMS and SOGS as well as NMS and GCS. To assess the reliability of the NMS,

the Cronbach's alpha and Spearman-Brown coefficients were calculated as internal consistency coefficients. Moreover, Intraclass (ICC) and Pearson's (r) correlation coefficients were computed for test–retest reliability. Moreover, item analysis was performed with corrected item-total correlation and squared multiple correlations, and the t-test was performed to check whether the items of the NMS distinguished between the lower 27% and upper 27% groups.

Results

Pre-Analysis

First, missing data analysis was performed. Minor missing data (e.g., 1–2 unanswered item/s per questionnaire) were identified for approximately 2% of individuals and these were replaced with medians. Subsequently, univariate, and multivariate data analyses were performed. Univariate normality is suspected in cases where skewness > |2| and kurtosis > |7|. Therefore, when the kurtosis and skewness values were investigated for the NMS items, it was found that the skewness < |2| and kurtosis < |7| for all items. Multivariate extreme values were investigated by Mahalanobis distance ($p < 0.001$). Observations with the Mahalanobis distance above were evaluated as extreme values and were excluded from the data set. After excluding these extreme values, data from 539 participants were included in the evaluation. In this sample, the proportion of problematic and pathological gamblers was 48%.

The Validity of NMS

For the construct validity of the NMS, the obtained sample (n = 539) was randomly divided into two groups to perform EFA and CFA. The first group (n = 330) was used for the exploratory factor analysis (EFA), and the second group (n = 209) was used for the confirmatory factor analysis (CFA). The factor structure of NMS was determined by SPSS 23, and CFA was performed by R Studio.

EFA

We conducted EFA with the first group (n = 330) to provide the primary factor structure of the NMS. Factor analysis was performed using principal-components analysis with varimax rotation. The factors were subjected to varimax rotation because it was desirable to maximize the distribution of the loadings within the factors, thus achieving a more interpretable factor set by loading highly variable variables on each factor. In EFA, the factors were determined using eigenvalues > 1 and scree-plot.

Before performing factor extraction, Kaiser's Meyer Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were evaluated to verify that the characteristics of the data set were appropriate for the factor analysis. The KMO was calculated as 0.979, thus showing that the sample size was sufficient for exploratory factor analysis and that the analysis would provide reliable factors (Field, 2013). Bartlett's test of sphericity was significant ($\chi 2 = 11{,}830$; $p < 0.001$), showing that the data comes from a multivariate normal distribution and were therefore suitable for EFA.

In the analysis of the NMS, two factors with eigenvalues greater than 1 emerged. However, an important issue to be considered when deciding the number of factors is the importance of the contribution of each factor to the total variance. The first factor was found to make a significant contribution to the variance of 68.602% (eigenvalue = 20.581), while the second factor was found to make a small contribution to the variance of only 3.817% (eigenvalue = 1.145) relative to the first factor. In such a case, the scree plot graph can also be examined to determine the scale as one factor (Çokluk et al., 2012). As shown in Fig. 1, the slope after the second point makes a plateau. The contribution of the factors from this point to the variance is exceedingly small and approximately the same. In this respect, the number of factors was determined to be one. Therefore, the factor analysis and scree test showed that a one-factor structure explaining 68.602% of the total variance was most appropriate for NMS. Item factor loadings ranged from 0.715 to 0.896 and communalities ranged from 0.561 to 0.803. The item content, factor loadings, and commonalities of the 30-item NMS are presented in Table 1.

CFA

The model-fit of the item-factor structure obtained in EFA was tested with CFA using the second group (n = 209). The maximum likelihood estimation method was used to determine whether the data fit the one-factor model. In CFA, many fit indices are used to reveal the adequacy of the model tested for compatibility. For the CFA conducted in this study, Normed Chi-Square (NC), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index

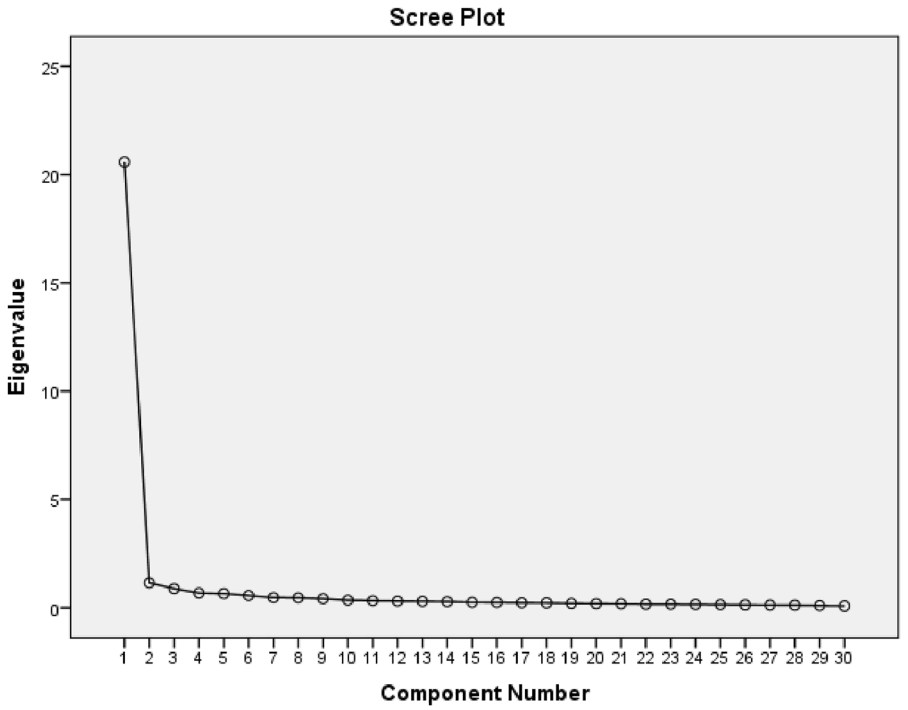

Fig. 1 NMS scree plot graph

Table 1 Item content, Factor loadings and Communalities for the Near Miss Scale

Items	Factor loading	Communality
1. I feel terribly close to winning while playing	0.760	0.577
2. Although I did not win while playing, I felt closer and closer to winning each time	0.792	0.627
3. I feel like I might have another chance when I lose	0.768	0.590
4. Because of my memories of being close to winning, I remember the days I earned more when I went to play	0.779	0.607
5. Although I have experienced great losses, I always remember my memories of being close to winning	0.796	0.633
6. Even though I have problems with my family (spouse), I cannot stop myself from going by thinking about the moments close to winning	0.715	0.511
7. I speak to my family, spouse, or those around me about the moments that I am close to winning	0.684	0.467
8. I dream of winning more by thinking about the moments that I am close to winning	0.814	0.662
9. Because of my memories of being close to winning, I feel like I can earn more even if I win while playing	0.834	0.695
10. I spend a long time when I am gambling with the feelings of being close to winning	0.842	0.708
11. The memory that "I was near to winning" motivates me to go to the casino	0.851	0.725
12. Although I lose a lot, I feel more interested in gambling because of my feelings of being close to winning	0.874	0.764
13. Due to my sense of being close to winning while playing, I see casino places as my favourite places	0.854	0.729
14. As I feel close to winning, I am going to gamble more to pay my debts	0.803	0.644
15. Because of my memories of being close to winning, I dream about winning before I go to the casino	0.797	0.635
16. While playing, I was losing control of myself because of my "I am near to wining" feelings	0.877	0.769
17. I do not realize that time is passing because of my "I am near to win" feelings while playing	0.835	0.698
18. I forget everything because of the thought that I will win and the feelings that I am close to winning while playing	0.863	0.745
19. I do not realize the losses until I run out of money because of my "near to win" feelings while playing	0.896	0.803
20. I cannot control myself in terms of going to the casino because of my "near to win" memories	0.887	0.786
21. Thinking about the moments that I have earned in the past and closed to winning motivates me to gamble again to replace the money I lost	0.877	0.769
22. I am going to make more money thinking about the moments I earned and closed to winning	0.889	0.791
23. I am going for gambling to relive my “being close to winning” feelings	0.850	0.722
24. I am going for gambling to relive my “winning” and “being close to winning” excitement	0.829	0.688
25. I keep playing for gambling to relive my “winning” and “being close to winning” excitement while playing	0.847	0.717

Table 1 (continued)

Items	Factor loading	Communality
26. Because of my memories of being close to winning, I cannot stop playing until I spend all the money in my pocket every time thinking about the probability of winning	0.878	0.770
27. Because of my memories of being close to winning, I cannot stop playing even when I win while playing	0.854	0.730
28. While playing, my "winning" and "close to winning" memories make me think I have figured out the logic of the game, making me feel like I am going to win	0.851	0.725
29. When I remember my memories of the excitement of the moment that I won or was close to winning, I feel the desire to experience the same excitement again	0.855	0.731
30. Even when I lost, the feeling of "I was just winning" makes me feel happy while playing	0.749	0.561

(AGFI), Comparative Fit Index (CFI), Bentler-Bonett Normed Fit Index (NFI), Bentler-Bonett Non-normed Fit Index (NNFI), Incremental Fit Index (IFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) were considered as criteria for the model fit indices. The values of GFI, AGFI CFI, NFI, NNFI and IFI approaching 1 is an indicator of a good fit, while RMSEA and SRMR values approaching 0 indicate good fit (Tabachnick & Fidell, 2007). The fit indices of the one-factor model are reported in Table 2.

It is stated that RMSEA values less than 0.05 are good, values between 0.05 and 0.08 are acceptable, values between 0.08 and 0.1 are marginal (but acceptable) and values higher than 0.1 are poor (not acceptable). Thus, the RMSEA value of 0.089 indicated a marginal but acceptable fit for the one-factor model. The SRMR value was 0.051, which was very close to the threshold value (0.05). A value of NC between 2 and 3 indicates acceptable fit and the NC value was determined as 2.911. Furthermore, it has been suggested that GFI, AGFI, NFI, NNFI, CFI and IFI values greater than 0.9 are good. The CFI and IFI values were both 0.903, which shows a relatively good fit. The values of GFI, AGFI, NFI did not exceed 0.9 (the threshold value), although they still met the requirement recommended Doll, Xia, and Torkzadeh (1994) that the value is acceptable if it is above 0.8. Therefore, since GFI, AGFI, NFI were 0.883, 0.831, 0.890, respectively, these values suggested an acceptable fit. NNFI was 0.895, which was very close to 0.9. When all the values of indices related to the data fit of the model are considered, it can be seen that the fit indices confirm the proposed one-factor model structure of the NMS and the one-factor model shows a sufficient level of fit with the dataset.

Criterion-Related Validity of NMS

The results of the correlation analysis for determining criterion-validity indicated that there was a significant high positive relationship between NMS and SOGS ($r = 0.601$, $p < 0.001$); and NMS and GCS ($r = 0.752$, $p < 0.001$).

Reliability of NMS

The Cronbach's alpha of the NMS showed that the internal consistency was very high (alpha = 0.981). The Spearman-Brown Split Half Reliability Coefficient was also high

Table 2 Confirmatory factor analysis of the Near Miss Scale

	Goodness-of-Fit Indices
NC	2.911
GFI	0.883
AGFI	0.831
CFI	0.903
NFI	0.890
NNFI	0.895
IFI	0.903
RMSEA	0.089
SRMR	0.051

(r = 0.961). Moreover, the test–retest reliability was calculated using intraclass correlation coefficients (ICC) and Pearson's r from the scale scores of 75 persons who completed the scale with a two-week interval. The ICC value of the total scores was 0.970 ($p < 0.001$) and Pearson's r was 0.972 ($p < 0.001$). This result showed that the NMS scores were stable over an approximately two-week interval.

Item Analysis

Item analysis of NMS was performed by corrected item-total correlation, squared multiple correlations, Cronbach's alpha if an item was deleted, and t-test for the comparison of the upper 27% and lower 27% groups on all items in the NMS to determine the total score prediction and distinctiveness of the items. Mean, standard deviation (SD), median, Interquartile range (IQR) and item analysis results are given in Table 3.

It was observed that the corrected item-total correlation varied between 0.657 and 0.858, and the squared multiple correlations ranged from 0.538 to 0.838 for all items in the scale. The corrected item-total correlation values of the items in the scale were found to be higher than the generally accepted value (expected to be higher than 0.500) (Özdamar, 2001). Additionally, the Cronbach's alpha obtained when the items in the scale were deleted separately were not higher than the general internal consistency coefficient of 0.981. Moreover, when conducting the t-test for the comparison of mean scores of the upper 27% (n = 145) and lower 27% (n = 145) groups for all items, the t values of all 30 items varied between 19.166 ($p < 0.001$) and 47.233 ($p < 0.001$) and there was a significant difference between the two groups. These results can be interpreted as the items in the scale distinguish gamblers in terms of near-miss and they are items intended to measure the same behaviour.

Discussion

The findings of the validity and reliability analysis results indicate that NMS is a valid and reliable measurement tool for assessing the severity of gambling tendency. The developed scale consists of 30 items. As a result of the EFA, a single factor structure was obtained by examining the item load values and the slope of the Scree Plot Graph. There is no item with a negative expression on the scale. The gambling tendency score is obtained by adding the values gained from each of the 30 items. The minimum score that can be obtained from the Near Miss Scale is 30 and the maximum score is 150. The higher the score, the greater the tendency to gamble. Considering all the index values related to the data fit of the model according to CFA results, it is seen that the suitability indexes confirm the single factor model structure of the NMS and that a factor model shows sufficient fit to the data set (DiStefano & Hess, 2005).

In adults, pathological gamblers may exhibit less self-regulatory behaviour and a lack of care than non-pathologic gamblers to deferment of gratification (Keough et al., 2018; Parke et al., 2004). Among other factors, poor decision making, cognitive distortions and emotional factors appear to be among the most important factors in the development and maintenance of problem gambling (Armstrong et al., 2020; Ciccarelli et al., 2017). For gamblers, NM is the most important determinant in the change of these cognitive and emotional structural characteristics of the individual (Bărboianu, 2019). Responsivity to NM outcomes both change the individual's emotional sensitivity and lead to the development of

Table 3 Item analysis results

Items	Mean(SD)	Median (IQR)	Corrected item-total corelation	Squared multiple correlation	Cronbach's Alpha if item deleted	t (lower 27%-upper 27%)
1.	3.523(1.238)	4(2)	0.657	0.637	0.981	19.279***
2.	3.214(1.338)	3(2)	0.724	0.667	0.980	22.746***
3.	3.344(1.236)	3(1)	0.719	0.634	0.980	21.861***
4.	3.273(1.272)	3(2)	0.709	0.604	0.981	21.622***
5.	2.952(1.375)	2(2)	0.751	0.645	0.980	26.445***
6.	2.336(1.391)	2(2)	0.702	0.608	0.981	24.948***
7.	2.489(1.376)	3(3)	0.660	0.548	0.981	19.166***
8.	2.872(1.404)	3(2)	0.782	0.686	0.980	30.256***
9.	3.181(1.315)	3(2)	0.786	0.699	0.980	27.091***
10.	3.061(1.338)	3(2)	0.809	0.745	0.980	29.808***
11.	2.877(1.429)	3(2)	0.823	0.734	0.980	39.690***
12.	2.782(1.420)	3(3)	0.841	0.760	0.980	38.443***
13.	2.914(1.362)	3(2)	0.804	0.700	0.980	30.407***
14.	2.605(1.437)	3(2)	0.781	0.741	0.980	30.989***
15.	3.024(1.395)	3(2)	0.755	0.628	0.980	25.884***
16.	2.873(1.429)	3(3)	0.843	0.778	0.980	39.511***
17.	3.186(1.361)	3(2)	0.795	0.712	0.980	29.753***
18.	2.957(1.409)	3(2)	0.828	0.737	0.980	37.419***
19.	2.879(1.437)	3(3)	0.845	0.778	0.980	40.650***
20.	2.650(1.412)	3(3)	0.858	0.799	0.980	45.317***
21.	2.728(1.408)	3(3)	0.851	0.793	0.980	47.233***
22.	2.895(1.338)	3(3)	0.855	0.783	0.980	40.709***
23.	3.011(1.392)	3(2)	0.812	0.776	0.980	32.854***
24.	3.123(1.351)	3(2)	0.795	0.838	0.980	28.867***
25.	3.104(1.354)	3(2)	0.808	0.794	0.980	32.403***
26.	2.773(1.475)	3(3)	0.847	0.777	0.980	44.207***
27.	2.895(1.388)	3(2)	0.825	0.738	0.980	35.691***
28.	3.028(1.341)	3(2)	0.815	0.733	0.980	30.679***
29.	2.893(1.369)	3(2)	0.806	0.745	0.980	32.995***
30.	2.831(1.407)	3(3)	0.681	0.538	0.980	20.504***

***$p < 0.001$

cognitive distortions (Wu et al., 2018). The lack of any measurement tool for NM, which is perhaps the most important determinant of the tendency to gamble, was a major deficiency.

As one of the screening tools for pathological gambling, SOGS has been shown to have robust features (Stinchfield et al., 2007), but is limited in identifying milder or lower threshold problem forms in the general population. To define problem gamblers, the Problem Gambling Severity Index (PGSI) has been specifically designed as a quantitative index of the severity of the gambling problem in the general population (Ferris & Wynne, 2001). PGSI evaluates 'soft' indicators of problem gambling (Miller et al., 2013), rather than focusing on diagnostic criteria such as SOGS. PGSI items mostly focus on both the

consequences of gambling behaviour and the financial, social, and health consequences of gambling. It remains unclear from the gambling psychometric scales whether increased scores reflect the tendency to use beliefs of cognitive distortions to justify excessive gambling (Michalczuk et al., 2011). Scales such as the Gambling Craving Scale (Young & Wohl, 2009) and Gambling Urge Scale (Raylu & Oei, 2004) related to cravings and urges are determinants of gambling symptoms and are used to determine the level of gambling severity. NM outcomes are the direct determinants of gambling tendency according to urges and cravings. Therefore, the NMS instrument can be used as a more direct measurement tool to determine the gambling tendency.

Another advantage of NMS is that each item has a five-point evaluation scale rather than the dichotomous (yes/no) format used in other scales for gambling behaviour. The total NMS score (30–150), which includes the continuity of the problematic gambling tendencies, constitutes an advantage over other scales. Thus, the NMS will enable us to monitor the non-problematic individual's development towards problem gambling as well as to determine the severity of the addiction of pathological gamblers. It is emphasized that the factors of gambling tendency should be investigated in societies where gambling addiction is intense (Çakıcı et al., 2019). NMS, as a measurement tool, more objectively can serve to determine the changes in gambling tendency for evaluation and monitoring purposes.

Despite its advantages, this study also has some limitations. Firstly, the scale is a self-report scale, so the participants may have minimized or maximized their feelings. The response options given on the scale is another limitation of the study because the answers given by the participants were limited to only choices and so the answer options were limited. The study is limited to participants who participated in the study and conducting the study with sample groups with different characteristics will enable us to better understand the gambling tendency to NM outcomes.

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