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Development of public stigma scales on alcohol use disorder and substance use disorder

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ABSTRACT

Different attitudes toward alcohol use disorder (AUD) and substance use disorders (SUD) require different evaluation. We aimed to develop and validate two measurement tools that evaluate the public stigma in terms of the stigma model: Public Stigma toward Alcohol Use Disorder Scale (PS-AUDS) and Public Stigma toward Substance Use Disorder Scale (PS-SUDS). The study was conducted with 503 individuals from Turkey. The 20 item- PS-AUDS explained 67.6% of the total variance. The 23 item -PS-SUDS explained 68.7% of the total variance. Cronbach alpha values of the scales were between .93 and .96. Results showed that the scales are valid and reliable.

Introduction

Stigma is a negative concept constructed on the basis of differences or deviation by society. Stigmatized elements focus on a trait, an attribute, a disability, or a disorder that distinguishes an individual from normal people in the society. Goffman (1963) defines stigma as "the behavior of valuing the stigmatized individual less desirable." Stigmatization has included the totality of behaviors that led to the society taking a stand against some patient groups and their exclusion from the society throughout the history. During the Middle Ages, mental illness was regarded as a punishment from God, and the affected were mistreated. Throughout the Enlightenment, institutions were established to help sufferers with mental illness (Rössler, 2016). Today, the stigmatization toward mental illnesses such as schizophrenia, depression, autism, anxiety disorders, and addiction is still a societal problem (Hamed, 2022; Hurley-Hanson et al., 2020; Rössler, 2016).

World Health Organization (WHO) draws attention that stigmatization of drug addiction ranked first among 18 different health problems

(Crapanzano et al., 2019). People with alcohol use disorder (PWAUD) and people with substance use disorder (PWSUD) are considered to be more responsible for their personal choice, behavior and more severely stigmatized than other mental illnesses (Lloyd, 2013; Schomerus et al., 2011). Individuals who use drugs are exposed to more severe stigmatization and drug use is considered as a moral failure (Adlaf et al., 2009; Atlam & Coskunol, 2022). It is thought that illicit drug users are weak-willed and have a criminal tendency (Wilkens & Foote, 2019), and considered as more dangerous than alcohol use disorder (AUD) and other mental disorders (Adlaf et al., 2009; Parcesepe & Cabassa, 2013). The humiliating social language ("alcoholic," "drunk," "drug addict," "addicted," "substance abuser") toward PWAUD and PWSUD leads to the construction of misinformation and different perceptions in the society (Wakemann, 2019).

The socio-cognitive model of stigma consists of basic elements: cognitive, emotional and behavioral elements that refer to stereotypes, prejudice and discrimination. Stereotype means negative beliefs about a person or a group (dangerousness, inadequacy, weakness of character, etc.). The stereotypes such as "weak-willed," "dangerous," "fraudulent" are used toward PWAUD (Yılmaz & Cüceler, 2019). Extremist stereotypes such as "drug users are criminals" are also common (Arboleda-Flórez & Sartorius, 2008). Prejudice refers to beliefs that lead to negative emotional reactions toward a person or a group (fear, anger, pity, etc.). Discrimination defines the behaviors toward prejudiced groups (avoidance, segregation, coercion, not employing etc.) (Corrigan & Watson, 2002; Rössler, 2016). The stigmatization process starts with labeling, and ends with discrimination and exclusion. When labeling occurs, the identity and characteristics of the labeled person lose their importance, the society perceives the labeled individual independent of the real identity, and regulates the attitudes accordingly. So it is the construction process of a new identity that the society focuses on disease-specific character flaws, leaving aside individual personality traits (Kasapoğlu & Kuş, 2008; Mahendra et al., 2007; Taşkın, 2004).

Present study

Different attitudes toward AUD and SUD require different evaluative approaches. In this context, we aimed to develop and validate two measurement tools that evaluate the public stigma toward AUD and SUD. Public Stigma toward Alcohol Use Disorder Scale (PS-AUDS) and Public Stigma toward Substance Use Disorder Scale (PS-SUDS) were developed and applied to a community-based population. We focused on the underlying theoretical structure of the scale for this study. So our research question was "Is it possible to measure public stigma for AUD and SUD

in different perspectives, and instead of beliefs about mental illnesses? Firstly, we hypothesized that the scales developed by the researchers were valid measurement tools. Secondly, both scales would have high internal consistency reliability. Thirdly, we expected that the PS-AUDS and the PS-SUDS would correlate highly with the Beliefs toward Mental Illness Scale (BMI). So instead of beliefs about mental illnesses, stigmatization of AUD/SUD would be evaluated in a structure that is compatible with the stigmatization model. The stigma-focused structuring of the scale based on cognitive, emotional and behavioral factors is a strength of this study, which will contribute to the literature. Such a scale would enable a deeper understanding of the society's stereotypes, feelings and discriminatory behaviors. In addition, with the two scales, it could be possible to evaluate public stigma of individuals of AUD and SUD in different perspectives. Especially in some countries where alcohol use is a problem, there may be a different attitude and measuring this attitude with a unique scale will be another contribution of this study to the field.

Materials and method

Procedure

Ethical approval was obtained from …. University Research Ethics Committee on 12 June 2019 with the decision number 19-6T75. The study was conducted between November 2018 and May 2022 due to the COVID-19 process in Turkey. The study was composed of several consecutive steps. In Study 1, a large, comprehensive item pool was created. Firstly previous tests/scales on beliefs and attitude toward addiction/mental health and stigma were reviewed. Then, 60 items were evaluated from the literature: Drug Knowledge Attitude Beliefs (Bryan et al., 2000), Addiction Belief Inventory (Luke et al., 2002), Substance Abuse Attitude Survey (Chappel et al., 1985), Gambling Perceived Stigma Scale (Donaldson et al., 2015), Scale of the Community Attitudes toward the Mentally Ill (Bag & Ekinci, 2006), Addictive Substances Attitude Scale (Tansel, 2006), Internalized Stigma of Mental Illness Scale (Ritsher et al., 2003), Beliefs Toward Mental Illness Scale (Bilge & Çam, 2008). From the scales, 60 items were selected, translated, transformed and adapted according to the stigma model by the researchers of this study who have an expertise on addiction and stigma. Moreover, the items of self-stigmatization scales were transformed according to the social point of view. All the items in these scales were transformed to public stigma toward AUD and SUD.

In Study 1, the researchers also interviewed patients who applied for addiction treatment. We asked the patients for self evaluation and society's view about addiction. The researchers then interviewed local people to ask society's evaluation about addiction in a field study. We

asked: "What do you think about people with alcohol addiction and substance addiction?" So, 31 items were added by taking the opinions of the society, and patients' self evaluation. Finally 91 items for the PS-AUDS and 92 items for the PS-SUDS were formed. The same items were used for the two scales, with one more item added to the PS-SUDS (Even if substance use was legal, I wouldn't approve it). The items were sent to 10 experts on the field of stigma and/or addiction for content validity. After evaluation, the items were edited, it was decided to use 71 items for the PS-AUDS and PS-SUDS for the survey area (Figure 1).

Sample size was calculated according to the rule of at least five times the item number (Erkuş, 2012). Moreover, it is recommended to include more than 300 participants for a good scale development and as appropriate for factor analysis (Boateng et al., 2018). It was planned to reach at least 350 people from the society for the evaluation of the scales. Instructions clearly stated that (1) completing the survey was voluntary, (2) responses were confidential, and (3) anonymity was guaranteed. Participants were determined by distribution of gender, age and education in the survey area.

In Study 2, 426 people attended the survey *via* field study and online. After statistical analysis, the scales were revised for the process of test–retest. Then these forms of the scales were used in Study 3 and Study 4. 77 individuals representing the society attended for the field research for Study 3. After three weeks, 60 of them were retested in Study 4.

Participants

The total number of participants to all of the phases of the study was 503 people aimed to be representative of thought to represent the society in Turkey. Non-probability sampling method was used to reach the sample. We defined the population and set a framework (distribution of gender, age and education) for inclusion of the participant profile to ensure diversity and balance. With this method, we were able to continue the study during the COVID-19 period and reach the sample *via* online. Participants, whose ages ranged from 18 to 80, were from 29 provinces and all seven

Process of the study

Figure 1. Process of the study. This figure illustrates our process for item pool and stages of the survey areas.

geographical regions of Turkey. The regions and provinces covered were as follows; Aegean Region: İzmir, Manisa, Kütahya, Aydın, Muğla, Uşak provinces; Mediterranean Region: Adana, Antalya, Mersin, Hatay, Osmaniye, Kahramanmaraş provinces; Marmara Region: İstanbul, Bursa, Edirne, Kırklareli, Çanakkale, Balıkesir, Kocaeli provinces; Central Anatolia: Ankara, Eskişehir, Kayseri, Sivas provinces; Southeastern Anatolia Region: Diyarbakır, Mardin provinces; Eastern Anatolia Region: Malatya province, Black Sea Region; Zonguldak province. The inclusion of all these regions show the ethnic richness of the participant profile.

Study 2: The research was conducted with 426 participants, of whom 240 attended from the field study. 186 of them completed an online questionnaire during the COVID-19 quarantine period (May 2020–February 2021). Finally 396 of them who completed all the scales were evaluated. The participants' mean age was 32.7 years (range 18–80, $SD = 13.8$), 44.7% ($n = 177$) of them were male and 55.3% ($n = 219$) of them were females.

Study 3: After the scales were restructured following comprehensive evaluation, their final forms were applied to 77 participants attending for the phase of test for the field research. 35 male (45.5%) and 42 female (54.5%) participants were reached. The mean age of the participants was 27.8 (range 18–55, SD= 10.3).

Study 4: After three weeks, 60 of them were reached again and retested. In this phase, 28 male and 32 female participants were retested.

Data collection tools

Sociodemographical form
Socio-demographic information was requested including specific questions as age, gender, marital status, family structure, and characteristics of alcohol/drug use.

Beliefs toward Mental Illness Scale (BMI)
The BMI scale was developed by Hirai and Clum (2000) to measure the positive and negative beliefs of individuals toward mental illness. It is a six-point Likert scale, the items are rated from 0 (completely disagree) to 5 (completely agree). The BMI has 21 items and 3 factors as dangerousness, poor social and interpersonal skills, and incurability. A high score indicates negative beliefs about mental illness. Bilge and Çam (2008) adapted the BMI to Turkish. The Cronbach's alpha coefficient was found .82 for Turkish population.

Addictive Substances Attitudes Scale (ASAS)
The Addictive Substances Attitudes Scale was developed by Tansel and used in adult (2006) and high school populations (2017). The five-point

Likert scale is based on 23 items. Five factors explain 53.52% of the total variance. Cronbach alpha is .88. The scale has five sub-dimensions: bilateral relations, personality structures of users, social relations with users, social perspectives toward users, family, social and environmental relations of users. A high score indicates a more negative attitude (Sungu, 2015; Tansel, 2017).

Data analysis

The analyses of the scales were carried out using IBM SPSS 25 and AMOS 25 (Analysis of Moment Structures). The factor structure of the PS-AUDS and the PS-SUDS were investigated using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Kaiser-Meyer-Olkin (KMO) test for sampling adequacy and Bartlett's test of Sphericity were calculated for the EFA. Principal component analysis (PCA) and varimax rotation technique were used to examine the factor structure of the scales. The item removal strategy was (i) items cross-loaded in two factors was less than .10 (ii) factor loads were less than .40. CFA is used for determining to what extent a factorial model of factors (latent variables), consisting of many observable variables, conforms to the real data (Byrne, 2001). Concurrent validity was examined by the Pearson's correlation coefficient test. Correlation coefficient r values ranging from .50 to .75 were considered as moderate to good correlation, and r values from .75 to 1 were considered as very good to excellent correlation between the scales and subscales (Udovičić et al., 2007). Internal consistency of the scales was also calculated by Cronbach's alpha. Test–retest reliability was assessed by Pearson product–moment (PPM) correlations.

Results

Public Stigma toward Alcohol Use Disorder Scale (PS-AUDS)

Construct validity

According to EFA results, KMO test for sampling adequacy was found .934. Bartlett's test of Sphericity was highly significant (χ^2=4849.126, df = 190, p = .0001). PCA and varimax rotation technique was used. For the most appropriate factor structure, the analysis was repeated after each item was taken out of the test in terms of cross-loading or low loading. Finally, a four-factor 20-item structure explaining 67.6% of the total variance was created. The subscales were defined as social distance (1,2,3,4,5,6), distrust (7,8,9), insufficiency (10,11,12,13) and incompatibility (14,15,16,17,18,19,20). According to the factors, the explained variance ratio was 20.9% for incompatibility, 18.0% for social distance, 16.9% for insufficiency, 11.6% for distrust (Table 1).

Table 1. Exploratory factor analysis of PS-AUDS.

|	Factor loading			
Items	F1 incompatibility	F2 social distance	F3 insufficient	F4 distrust
16. Individuals with alcohol use disorder have a tendency to apply violence. *(Alkol kullanım bozukluğu olan bireyler şiddete eğilimlidir.)*	.812			
19. Individuals with alcohol use disorder can't control themselves. *(Alkol kullanım bozukluğu olan bireyler kendini kontrol edemez.)*	.808			
18. Individuals with alcohol use disorder are prone to commit crime. *(Alkol kullanım bozukluğu olan bireyler suç işlemeye yatkındır.)*	.715			
20. Individuals with alcohol use disorder may pose a danger to the society. *(Alkol bağımlısı bireyler toplum için tehlike oluşturabilir.)*	.707			
14. Individuals with alcohol use disorder have difficulty to control their anger. *(Alkol kullanım bozukluğu olan bireyler öfkelerini kontrol etmekte zorlanır.)*	.669			
17. Individuals with alcohol use disorder don't obey social rules. *(Alkol kullanım bozukluğu olan bireyler toplumsal kurallara uymaz.)*	.578			
15. Individuals with alcohol use disorder don't care about moral rules. *(Alkol kullanım bozukluğu olan bireyler ahlak kurallarına önem vermez.)*	.575			
2. Being in the same social environment with someone with alcohol use disorder makes me uncomfortable. *(Alkol kullanım bozukluğu olan biriyle aynı sosyal ortamda bulunmak beni rahatsız eder.)*		.820		
1. I prefer to stay away from people with alcohol use disorder. *(Alkol kullanım bozukluğu olan kişilerden uzak durmayı tercih ederim.)*		.791		
3. I get nervous around individuals with alcohol use disorder. *(Alkol kullanım bozukluğu olan bireylerin yanında gergin olurum.)*		.703		
4. I don't want to be neighbors with someone with alcohol use disorder. *(Alkol kullanım bozukluğu olan biriyle komşu olmak istemem.)*		.652		
6. I am afraid of individuals with alcohol use disorder. *(Alkol kullanım bozukluğu olan bireylerden korkarım.)*		.609		
5. Being in the same workplace with someone with alcohol use disorder makes me uncomfortable. *(Alkol kullanım bozukluğu olan biriyle aynı işyerinde olmak beni rahatsız eder.)*		.589		
11. Individuals with alcohol use disorder cannot be successful. *(Alkol kullanım bozukluğu olan bireyler başarılı olamaz.)*			.837	

Table 1. Continued.

| | Factor loading | | | |
| | F1 | F2 | F3 | F4 |
Items	incompatibility	social distance	insufficient	distrust
13. Individuals with alcohol use disorder cannot take care of themselves. *(Alkol kullanım bozukluğu olan bireyler kendine bakamaz.)*			.811	
10. Someone with alcohol use disorder cannot handle a job. *(Alkol kullanım bozukluğu olan bir kişi kendi başına bir işin üstesinden gelemez.)*			.806	
12. Individuals with alcohol use disorder are weak-character. *(Alkol kullanım bozukluğu olan bireylerin karakteri zayıftır.)*			.685	
7. I don't want to lend money to individuals with alcohol use disorder. *(Alkol kullanım bozukluğu olan bireylere borç vermek istemem.)*				.812
8. I don't want to live with someone with alcohol use disorder. *(Alkol kullanım bozukluğu olan biriyle aynı evde yaşamak istemem.)*				.678
9. I have difficulty in trusting individuals with alcohol use disorder. *(Alkol kullanım bozukluğu olan bireylere güvenmekte zorlanırım.)*				.664
Variance (%)	20.943	18.068	16.980	11.630
Total variance (%)				67.622

Table 2. DFA fit indexes of the scales.

	PS-AUDS	Fit level	PS-SUDS	Fit level
(χ2/df)	2.505**	Good fit	2.298**	Good fit
RMSEA	.062**	Acceptable fit	.057**	Good fit
NFI	.91*	Acceptable fit	.93*	Acceptable fit
CFI	.94*	Acceptable fit	.96**	Good fit
GFI	.90*	Acceptable fit	.90*	Acceptable fit

CFA was performed for structural validity. Acceptable fit values and good fit values of χ^2/df, Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Normed Fit Index (NFI), and Comparative Fit Index (CFI) are shown in Table 2 (İlhan & Cetin, 2014). The modification indices (MI) in AMOS suggested some modifications that the model would be improved if item 1 and item 2 were covariated. Finally, model fit indices of PS-AUDS were as follows: χ^2 = 408.31, χ^2/df = 2.505, CFI = .94, NFI = .91, GFI = .90, RMSEA = .062. Referring to Table 2, χ^2/df, RMSEA showed an acceptable fit; GFI, NFI, and CFI showed an acceptable model for PS-AUDS. Standardized regression weights for the subscales ranged from .48 to .84 and were significant ($p < .001$) (Figure 2).

Pearson Correlation Coefficients were moderately correlated from .45 to .73 between the subscales; highly correlated from .75 to .88 between the PS-AUDS and the subscales (Table 3).
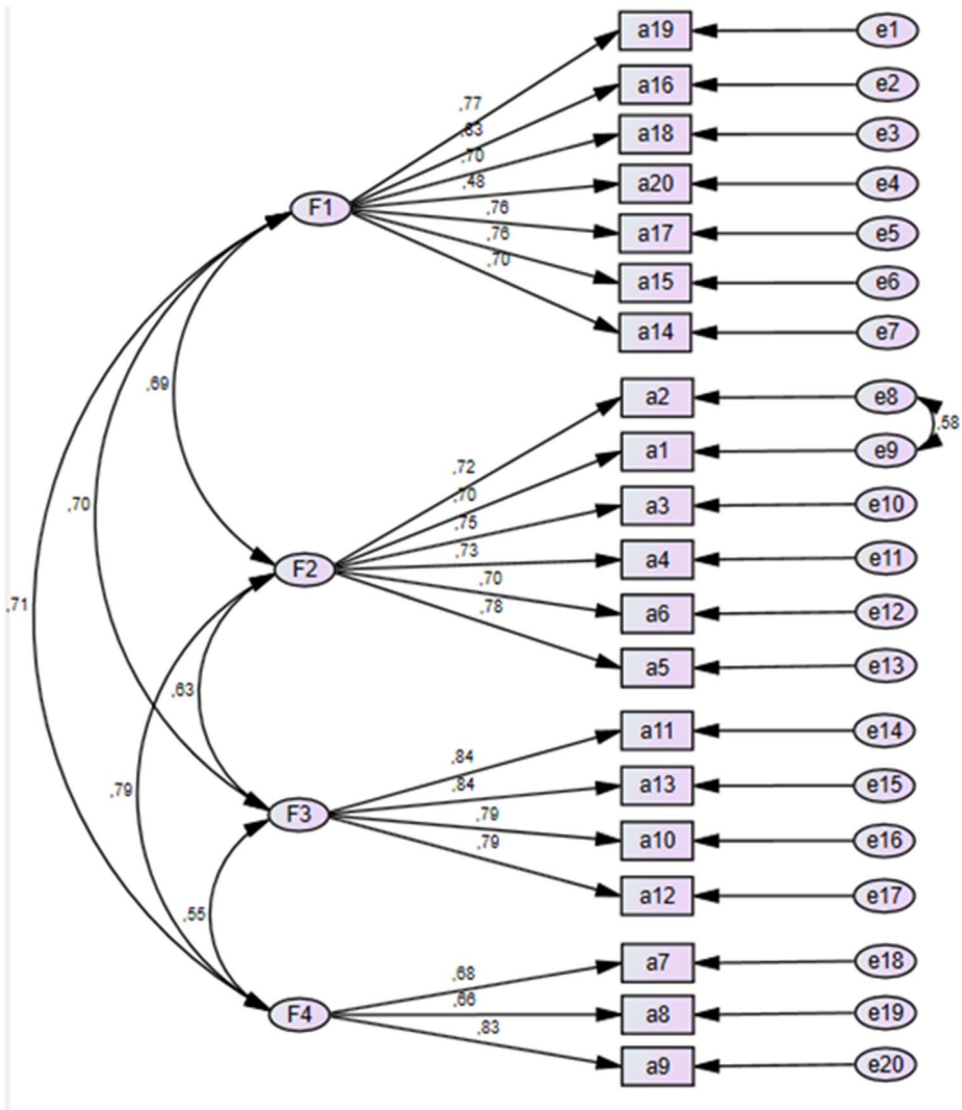
PS-AUDS Path diagram

Figure 2. Path diagram of CFA for Public Stigma toward Alcohol Use Disorder Scale.

Concurrent validity was evaluated by correlation analysis between the PS-AUDS, the PS-SUDS and the scales which were used for external validity. The PS-AUDS and the PS-SUDS were found positively high correlated with the BMI and the ASAS (Table 3).

Reliability
The internal consistency of the PS-AUDS showed great reliability (Cronbach's α = .93). The internal validity of the subscales showed high reliability

Table 3. Correlations between PS-AUDS, PS-SUDS, BMI, ASAS.

	1	2	3	4	5	6	7	8	9	10
1.PS-AUDS incompatibility	–									
2.PS-AUDS social distance	.62**	–								
3.PS-AUDS insufficiency	.63**	.55**	–							
4.PS-AUDS distrust	.59**	.62**	.45**	–						
5.PS-AUDS total	.88**	.86**	.78**	.75**	–					
6.PS-SUDS social distance	.62**	.70**	.52**	.61**	.74**	–				
7.PS-SUDS negative traits	.70**	.50**	.64**	.51**	.72**	.70**	–			
8.PS-SUDS incompatibility	.72**	.54**	.51**	.52**	.71**	.72**	.80**	–		
9.PS-SUDS total	.74**	.65**	.62**	.61**	.80**	.90**	.91**	.91**	–	
10.BMI	.57**	.53**	.49**	.48**	.63**	.61**	.64**	.64**	.69**	–
11.ASAS	.58**	.59**	.56**	.50**	.68**	.73**	.74**	.67**	.79**	.63**

$**p < .01$.

(Cronbach's α= .90 for Factor 1- incompatibility; α= .88 for Factor 2-social distance; α= .88 for Factor 3-insufficiency; α= .76 for Factor 4-distrust).

Test–retest phase was used in the field study. The scales were applied three weeks apart to study time-based invariance, and the test–retest reliability coefficient was found as .75 for the PS-AUDS.

Public Stigma toward Substance Use Disorder Scale (PS-SUDS)

Construct validity

KMO test (KMO= .964) showed that the sample size was great for factor analysis. Bartlett's test of Sphericity (χ^2=7329.478, df = 253, p= .0001) showed high significance. EFA was conducted with PCA and the varimax rotation technique. Finally, a three-factor 23-item structure of the PS-SUDS emerged. The scale explained 68.7% of the total variance. The three factors were defined as social distance (1,2,3,4,5,6,7,8), negative traits (9,10,12,15,17,18,20,22) and incompatibility (11,13,14,16,19,21,23). The explained variance ratio was 24.6% for F1-social distance, 24.4% for F2-negative traits, 19.6% for F3- incompatibility (Table 4).

According to CFA, MI suggested three modifications that the model would be improved if item 9 and item 10; item 1 and 2; item 6 and 8 covariated. Model fit indices of the PS-SUDS were as follows: $\chi^{2/}$df = 2.29, CFI = .96, NFI = .93, GFI = .90, RMSEA = .057. The values had acceptable fit rates for GFI, and NFI; good fit rates for $\chi^{2/}$df, RMSEA and CFI (Table 2). Standardized regression weights ranged from .63 to .86 and were significant ($p < .001$) (Figure 3)

Pearson Correlation Coefficients were moderately correlated from .45 to .73 between the subscales; highly correlated from .75 to .88 between the PS-AUDS and the subscales (Table 3).

Table 4. Exploratory factor analysis of PS-SUDS.

| Items | Factor loading | | |
	F1 social distance	F2 negative traits	F3 incompatibility
2. Being in the same social environment with someone with substance use disorder makes me uncomfortable. *(Madde kullanım bozukluğu olan biriyle aynı sosyal ortamda bulunmak beni rahatsız eder.)*	.806		
1. I prefer to stay away from people with substance use disorder. *(Madde kullanım bozukluğu olan kişilerden uzak durmayı tercih ederim.)*	.792		
6. I am afraid of individuals with substance use disorder. *(Madde kullanım bozukluğu olan bireylerden korkarım.)*	.760		
3. I get nervous around individuals with substance use disorder. *(Madde kullanım bozukluğu olan bireylerin yanında gergin olurum.)*	.726		
7. I don't want to have a friend with substance use disorder. *(Madde kullanım bozukluğu olan bir arkadaşım olmasını istemem.)*	.720		
4. I don't want to be neighbors with someone with substance use disorder. *(Madde kullanım bozukluğu olan biriyle komşu olmak istemem.)*	.716		
5. Being in the same workplace with someone with alcohol use disorder makes me uncomfortable. *(Madde kullanım bozukluğu olan biriyle aynı işyerinde olmak beni rahatsız eder.)*	.693		
8. I avoid talking to someone with substance use disorder. *(Madde kullanım bozukluğu olan biriyle konuşmaktan kaçınırım.)*	.679		
17. Individuals with substance use disorder only think about themselves. *(Madde kullanım bozukluğu olan bireyler sadece kendilerini düşünür.)*		.756	
10. Individuals with substance use disorder cannot take care of themselves. *(Madde kullanım bozukluğu olan bireyler kendine bakamaz.)*		.753	
18. Individuals with substance use disorder don't obey social rules. *(Madde kullanım bozukluğu olan bireyler toplumsal kurallara uymaz.)*		.739	
12. Individuals with substance use disorder don't respect others. *(Madde kullanım bozukluğu olan bireylerin diğer insanlara saygıları yoktur.)*		.711	
15. Individuals with substance use disorder don't care about moral rules. *(Madde kullanım bozukluğu olan bireyler ahlak kurallarına önem vermez.)*		.687	
22. Individuals with substance use disorder don't take any responsibility *(Madde kullanım bozukluğu olan bireyler sorumluluk almaz.)*		.682	
9. Individuals with substance use disorder cannot be successful. *(Madde kullanım bozukluğu olan bireyler başarılı olamaz.)*		.672	

(Continued)

Table 4. Continued.

|	Factor loading		
Items	F1 social distance	F2 negative traits	F3 incompatibility
20. Individuals with substance use disorder are liar. *(Madde kullanım bozukluğu olan bireyler yalancıdır.)*		.664	
13. Individuals with substance use disorder experience difficulties in their family life. *(Madde kullanım bozukluğu olan bireyler aile hayatında sıkıntı yaşarlar.)*			.779
23. Individuals with substance use disorder may pose a danger to the society. *(Madde kullanım bozukluğu olan bireyler toplum için tehlike oluşturabilir.)*			.687
19. Individuals with substance use disorder are prone to commit crime. *(Madde kullanım bozukluğu olan bireyler suç işlemeye yatkındır.)*			.678
14. Individuals with substance use disorder cause more problems in the work environment. *(Madde kullanım bozukluğu olan bireyler iş ortamında daha fazla sorun çıkarır.)*			.650
16. Individuals with substance use disorder have a tendency to apply violence. *(Madde kullanım bozukluğu olan olan bireyler şiddete eğilimlidir.)*			.639
11. Individuals with substance use disorder have difficulty in controlling their anger. *(Madde kullanım bozukluğu olan bireyler öfkelerini kontrol etmekte zorlanır.)*			.637
21. Individuals with substance use disorder can't control themselves. *(Madde kullanım bozukluğu olan bireyler kendini kontrol edemez.)*			.634
Variance (%)	24.675	24.403	19.675
Total variance (%)			68.753

Reliability

PS-SUDS showed high reliability in terms of internal consistency (Cronbach's α = .96). The subscales of the PS-SUDS also had high reliability (Cronbach's α= .93 for Factor 1-social distance; α= .93 for Factor 2-negative traits; α= .92 for Factor 3-incompatibility).

In applications made at intervals of three weeks, test–retest reliability coefficient was found as .81 for the PS-SUDS.

Discussion

The current study describes the development of two new instruments to assess public stigma toward AUD and SUD. Previous studies have developed scales on knowledge and beliefs about drugs or addiction to evaluate the risks for young people (Bryan et al., 2000; Chappel et al., 1985; Luke et al., 2002). In Turkey, most attitude studies have to use BMI for evaluating stigma toward AUD and SUD, due to the lack of a specific scale on addictions. So we focused on developing public stigma scales toward
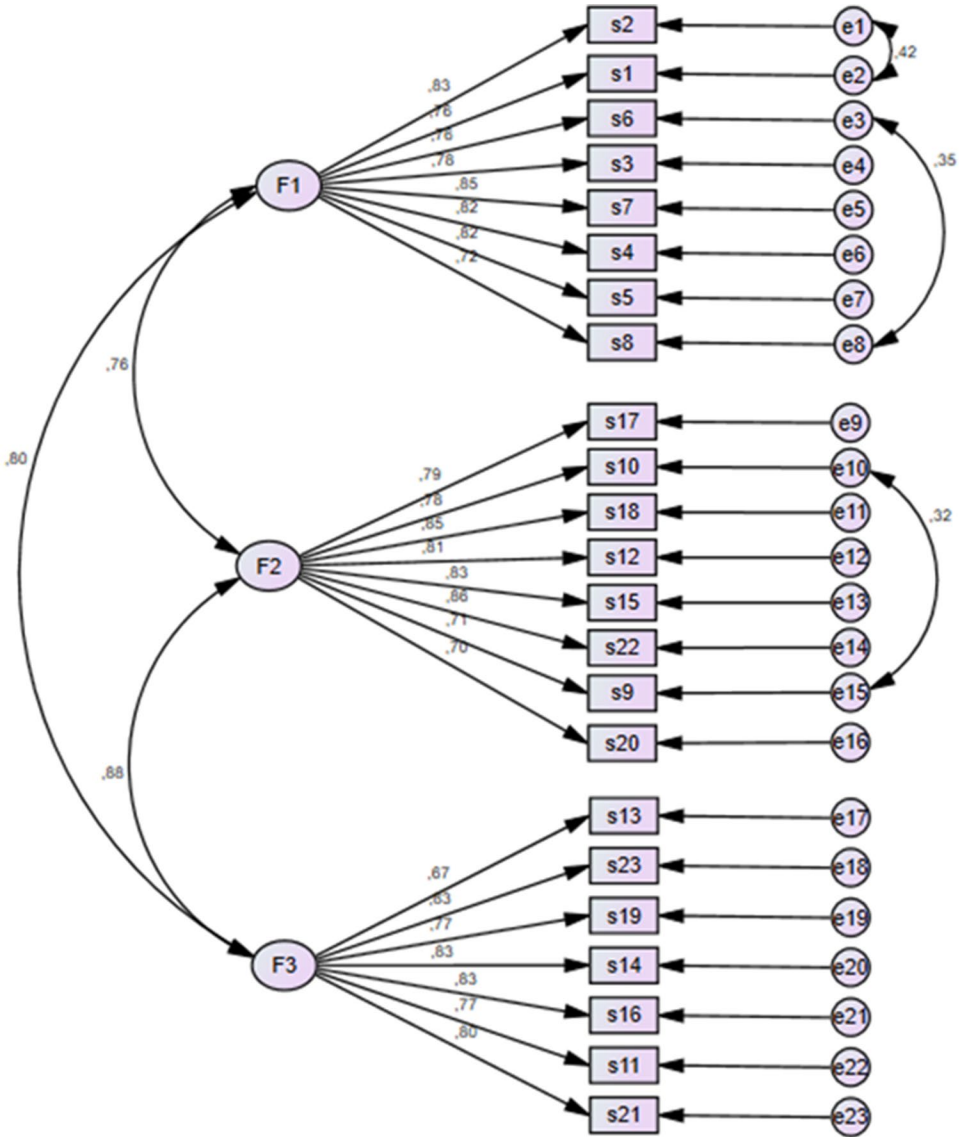
PS-SUDS Path diagram

Figure 3. Path diagram of CFA for Public Stigma toward Substance Use Disorder Scale.

AUD and SUD referring the stigma model. Since cannabis use is illegal in Turkey, substance use is associated with crime or deviance than a mental health problem which could bring about different views of the community toward alcohol and substance dependence. Moreover, the conflict between traditional values, religion and alcohol/substance use causes

more public stigma. So strong social norms draw strict boundaries against deviance (Wanke et al., 2022).

This study was conducted with exploratory and confirmatory factor analyses (EFA, CFA), reliability, and concurrent validity analyses. KMO values of the PS-AUDS (KMO= .934) and the PS-SUDS (KMO= .964) were found high for sample adequacy. Field (2013) points out that KMO greater than .80 is widely accepted. Bartlett's Tests of Sphericity were also satisfactory for both scales, meaning the correlation matrix were suitable for factor analysis (Taherdoost et al., 2022). The PS-AUDS and the PS-SUDS highly explained 67.6% and 68.7% of the total variance. Hair et al. (2007) stated that the explained variance is commonly 50–60% in the humanities (Taherdoost et al., 2022). The findings suggested a three-factor structure as "social distance," "negative traits," and "incompatibility" for the PS-SUDS and a four-factor structure as "social distance," "incompatibility," "insufficiency" and "distrust" for the PS-AUDS. Despite the same/parallel wording of the questions, different factor structures emerged for the two scales. These subscales were accepted as the most suitable structures in terms of their own logic. A different factor emerged representing "negative traits" in the PS-SUDS. As we know the society uses negative stereotypes more commonly and more cruelly toward PWSUD. Around 3/4 of the population have a negative attitude toward drug dependency and around 2/3 of the population is toward alcohol dependency (Rössler, 2016). In a community-based study conducted on 7000 people in Istanbul, it was revealed that the society stigmatized drug users more than people with alcohol addiction. Considering the use of illegal substances as committing a crime also leads to more stigmatization of drug users (Ögel, 2007). Nieweglowski et al. found stereotypes as four main factors as reckless, unreliable, inadequate, threat for PWSUD (Nieweglowski et al., 2019). In a systematic review about comparison of alcohol addiction and other mental illnesses, the stereotypes as unreliable, unpredictability and being dangerous, unstable toward people with alcohol addiction became also prominent (Schomerus et al. 2011). We defined the factor of "incompatibility" as stereotypes about behavioral problems (dangerousness, difficulty, violence) of PWAUD and PWSUD implied by the society. Additionally, there is a moral conceptualization of addiction causing to a misbelief that people with PWSUD have a lack of moral and social norms (Witte et al., 2019). Social distance is mostly preferred by the society as a discriminant behavior. The desire for social distance is considerably stronger toward people with addiction than other mental illnesses (Schomerus et al., 2011). As it is known "fear" leads to avoidance behavior (Corrigan & Watson, 2002; Nieweglowski et al., 2019). We noticed that the factor of social distance emerged as a combination of emotions (fear, nervousness) and avoidance behavior (ignoring, staying away, unwilling to stay together). The scales contained the

cognitive-behavioral model aspect of stigma. Perception of substance use disorder as dangerous, and with lack of accountability and willpower are effective in the isolation by the society (Witte et al., 2019).

A high correlation was found between the total score and the subscales. It means that the subscales contribute to the measurement of the same structure (Şencan, 2005). We can say both scales have a good model fit in terms of RMSEA and $\chi^{2/}$df. Values above .08 would indicate a poor model fit. In the early 2000s, some studies considered values below .06 were good, while in others .07 was considered a threshold value (McQuitty, 2004). If the number of participants is higher than 250 and the number of items is between 12 and 30, the threshold value for a good model is suggested as .07 (Byrne, 2001; Yaşlıoğlu, 2017). The PS-AUDS and PS-SUDS had acceptable fit rates with the values of CFI, GFI, NFI. İlhan and Cetin (2014) indicated the highest values for good and acceptable fit rates according to a combination of different suggestions. Values between .90 and .95 were suggested as acceptable fit rates for CFI, GFI and NFI. The most commonly used criterion for a superior fit is more than .95 (Byrne, 2001; Hu & Bentler, 1999). As a result, PS-AUDS and PS-SUDS had satisfactory model fit values.

Concurrent validity was investigated to confirm the relationships between the scales. PS-AUDS and PS-SUDS had a high correlation with BMI and ASAS. Hair et al. (2007) suggested $.6 \leq r \leq .79$ as a high correlation coefficient.

Test–retest reliability coefficients of the scales were .81 and .75, indicating that the PS-AUDS and PS-SUDS had good retest reliabilities and were reliable measures. Cicchetti (1994) defined values above .75 as excellent.

Although the results of our research showed both scales to be good instruments, the study has some limitations. Firstly the COVID-19 pandemic affected the process of our study, so we applied the scales both *via* online and public area. But our results indicated that there was no significant difference between the scores of both data collection methods. Furthermore, we had an opportunity to see the suitability of the scales both in the field and online. Secondly, the scales were developed by applying to Turkish participants. However, in the process of creating the scale, stereotypes and discriminatory behaviors that are frequently found in the international literature were taken into account. To increase the generalizability of the results, we recommend translation of the scales into different languages, so as to test the expression model in different countries.

Conclusively, it can be stated that the PS-AUDS and the PS-SUDS had the necessary characteristics to adequately assess public stigma toward AUD and SUD. The results of this study illustrate that the scales were valid and reliable measurement tools.

Informed consent

'Additional informed consent was obtained from all participants for which identifying information is included in this article.'

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