



Stigmatization of people with alcohol and drug addiction among Turkish undergraduate students

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ABSTRACT

Introduction: Stigmatization of people with substance use problems have been reported to be high among young adults in Western countries. It is not clear if this finding could be replicated among emerging adults in non-Western countries. Thus, the aim of this study was to firstly explore stigmatizing attitudes of undergraduate students in Turkey towards people with alcohol, marijuana and heroin addiction, and then test a mediation model to explain stigmatizing attitudes among college students.

Method: A total of 513 undergraduate students participated in the study. They completed a set of questionnaires to measure perceived stigma towards substance use, perceived danger and feeling fearful towards people with substance addiction (i.e., alcohol, heroin, marijuana), and a willingness to engage in relationships with people who are addicted to these three substances.

Results: Females, compared to males, reported being more fearful of people who are addicted to alcohol, marijuana and heroin. Younger compared to older participants perceived people who are addicted to these substances as more dangerous. Younger participants also had higher social distance towards people who are addicted to alcohol and marijuana than older participants. Perceived dangerousness and fearfulness partially mediated the relationship between perceived stigma and social distance in alcohol, marijuana and heroin.

Conclusion: Research findings may help determine potential correlates of stigmatizing attitudes as well as developing models to explain stigmatizing attitudes among Turkish college students.

1. Introduction

Drug and alcohol addiction is a major public health concern because of its negative physical health, economic, and social consequences (Degenhardt et al., 2016). Physically, these addictions are associated with health issues such as hepatitis C, HIV/AIDS, and cardiovascular complications (Thakkar et al., 2019; Zibbell et al., 2018). Economically, drug and alcohol addiction has been reported to contribute to economic cost as a result of substance-related activities such as crime and to lost work productivity, and use of health care services (Degenhardt et al., 2016). Socially, people with alcohol and drug addiction are often socially isolated as their use of these substances tend to erode social ties with their family and friends (Christie, 2021; Daley et al., 2018).

Stigma is likely to exacerbate these negative effects because it is a significant barrier to accessing health care and drug treatment services (Kilian et al., 2021). Not seeking professional help may lead to drug addiction becoming chronic and lead to young people with this condition being socially excluded. In this respect, adolescents and emerging adults with drug addiction are considered as highly vulnerable. In particular accumulative number of studies have reported drug addiction as one of the most stigmatized conditions likely because it is considered as an act of personal choice (Sorsdahl et al., 2012).

Although there is no consensus among researchers regarding the exact definition of stigma to date, Dannatt et al. (2021) define stigma as “a mark of shame, disgrace, or disapproval which results in an individual being rejected, discriminated against, and excluded from society” (p. 1).

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Mental health professionals have identified various social and cognitive components that can lead to stigma in people with and without mental health problems. These include three common components: stereotypes, prejudice and discrimination (Corrigan, 2004; Corrigan et al., 2014). Stereotypes are negative beliefs about members of a particular social group and reflect a perceived difference between the “us” and “them” categories (Link & Stuart, 2017). They guide peoples’ attitudes and perceptions and promote the discrediting of individuals outside the perceived majority (Oxle & Corrigan, 2018). Stereotypes are specific beliefs about people with mental illness. Research suggests that stereotypes such as dangerous, incompetent, weak, and unpredictable are common among the general population in different societies (Corrigan, 2004; Corrigan et al., 2014). Prejudice is the adoption of negative stereotypes held by the general public about members of a social group and leads to negative emotional reactions. Finally, discrimination is the behavioral consequences of prejudice.

The negative impact of stigmatization towards individuals with mental illness have been reported in numerous studies (Kilian et al., 2021; Livingston & Boyd, 2010). For example, in a meta-analysis study among people with mental illness including samples of substance use disorders, Livingston and Boyd (2010) found stigma to be associated with lower empowerment, lower self-efficacy, lower social support, reduced adherence to treatment, diminished hope, and higher symptom severity. Research also suggests that people with drug addiction are often viewed as unpredictable and dangerous (Phelan & Link, 2004) and are being labelled as “junkies” (Muncan et al., 2020). These views often lead to avoidance by others (Phelan, 2005), difficulties in the job seeking and relationships (Khalid et al., 2020), and may lead to reduced access to care (Dannatt et al., 2021). Furthermore, people with drug addiction may develop self-stigma which in turn influence their behavior such as decreased utilization of health service, leading to poorer health outcomes (e.g., psychological distress and poorer quality of life) and more chronic condition (Cheng et al., 2019; Sarkar et al., 2019).

Given the negative consequences of stigma in different spheres of life for people with substance use problems, numerous studies have been conducted to determine the nature, causes, correlates and consequences of stigmatizing attitudes for people with substance use problems in clinical and nonclinical settings. For example, Muncan et al. (2020) showed that females with no experience in drugs consumption tend to hold more negative views and were less tolerant of drug misuse compared to males. Similarly, Brown (2011) reported that female undergraduate students tend to have higher social distance and experience more negative emotions against people with substance use problems than male undergraduate students. Krus and Choi (2020) found that perceived social distance negatively correlated with age among college students.

While informative, all the studies above were conducted in Western countries, and may not be generalizable to people living in non-Western countries due to differences in cultural values. For example, perceptions of family honor and shame have been found to correlate with formal help-seeking decision and to acceptance of using medical treatments to psychological disorders (Marrow & Luhrmann, 2012). The illnesses of family member also tend to be kept secret to save face in non-Western countries (Abdullah & Brown, 2011; Mak & Cheung, 2008; Topkaya, 2015). Furthermore, studies exploring stigma and drug addiction among undergraduate students in developing countries are scarce so that it is not fully clear if stigmatizing attitudes towards people with drug addiction reported in Western countries could be replicated among undergraduate students in non-Western countries such as in Turkey.

Stigmatizing attitudes toward people with alcohol and drug addiction could result in avoidance and social distancing, which could exclude those stigmatized individuals from meaningful social interactions (Adlaf et al., 2009; Link & Phelan, 2001). Stigmatizing attitudes towards people with drug addiction has been regarded as a key contributor to healthcare inequality (World Health Organization, 2019). However, studies on stigmatizing attitudes towards people with drug

addiction among undergraduate students in Turkey are lacking. To make up this gap, the aim of this study was to (a) explore sex and age differences in stigmatizing attitudes of undergraduate students in Turkey towards people with alcohol, marijuana and heroin addiction, and to (b) examine the association between these stigmatizing attitudes in a parallel mediation model (Fig. 1).

2. Method

2.1. Participants

The study participants consisted of 513 undergraduate students who were recruited from various faculties from a mid-sized public university located in the Central Black Sea Region of Turkey. Participants were recruited using convenience sampling method. Of the 513 participants, there were 371 (72.3%) female and 142 (27.7%) male undergraduate students. The age of participants ranged from 18 to 33 years old, with a mean age of 21.20 ($SD = 2.15$). Most of the participants were single (97.5%) and have indicated Islam (90.1%) as their religious affiliation.

2.2. Measures

All measures were adapted to Turkish in accordance with recommendations of the International Test Commission Guidelines for Translating and Adapting Tests (International Test Commission, 2017). First, the first two co-authors (NT and ES) independently translated the scales into the Turkish language. Second, the translated scales were compared, and any discrepancies were resolved through discussion. Third, three English native speakers completed the back-translation of the Turkish versions of the scales. The English translations of the scales were compared with the original scales, and any discrepancies were resolved through discussion. The newly translated scales were given to 10 undergraduate students to complete to identify any unclear or ambiguous items. Although no problems were reported in the perceived dangerousness, fear, and social distance scales, students reported difficulties in understanding negatively worded items of the Perceived Stigma of Addiction Scale. Thus, all reverse-scored items were rewritten as positive items which indicate greater levels of perceived stigma. Previous studies using different versions of this scale also found problems related to reverse-scored items of scale among people with and without mental health problems (Interian et al., 2010; Şahin & Topkaya, 2021). Items of perceived dangerousness, fear and social distance scales were reworded to make them specific to people who are addicted to alcohol, marijuana, and heroin. Other researchers have also modified these scales to measure perceived dangerousness, fear, or social distance against people with substance use problems (Brown, 2011, 2015; Janulis, 2010; Janulis et al., 2013).

2.2.1. Sociodemographics

A personal information form was used to collect information about sex, age, marital status, and religious affiliation of the participants.

2.2.2. Perceived stigma

Perceived Stigma of Addiction Scale (PSAS; Luoma et al., 2010) was used to measure perceived substance stigma among undergraduate students. This scale provides information about the extent to which participants believes the majority of people will discriminate against or devalue those who have suffered or are currently suffering from substance use problems. The scale consists of eight items which can be rated on a four-point Likert-type scale ranging from Strongly Disagree (1) to Strongly Agree (4), with total scores ranging from 8 to 32. Higher scores indicate greater levels of perceived stigma.

2.2.2.1. Construct validity and reliability of PSAS. Exploratory factor analysis and reliability analyses were performed to determine the

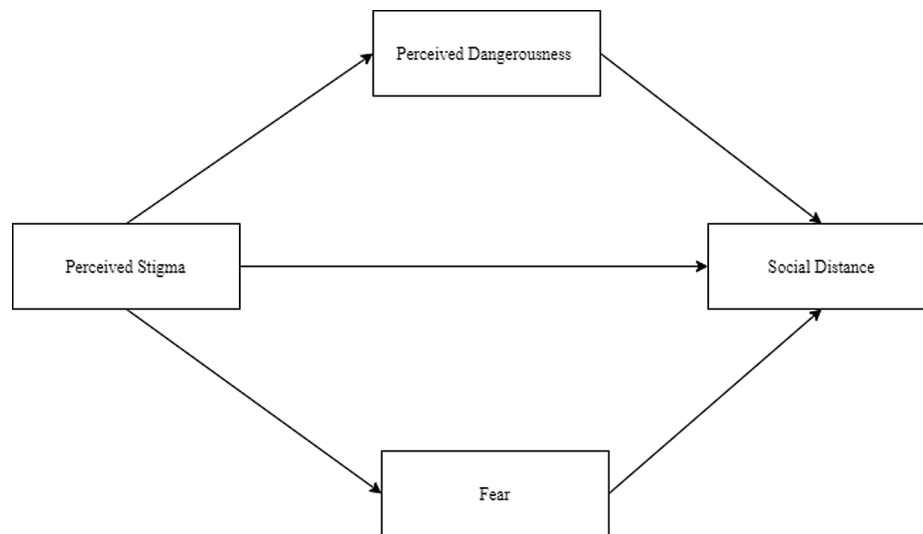


Fig. 1. Proposed mediation model.

underlying factor structure and reliability of the PSAS. Principal axis factoring extracting method was used in all exploratory factor analyses. Eigenvalue greater than one rule, parallel analysis, and scree plot method were also used to determine the number of factor to retain in all exploratory factor analyses. Preliminary analyses were performed to examine suitability of correlation matrices for exploratory factor analysis in all scales. Results of these analyses suggested the suitability for correlation matrices for exploratory factor analyses for all scales (Tabachnick & Fidell, 2012). All data required to reproduce the analyses in this study are available from Open Science Framework (osf.io/75nct).

All methods of number of factors to retain suggested to extract a single factor in exploratory factor analysis for PSAS items. Thus, exploratory factor analyses were conducted using forced single factor structure. Results of exploratory factor analysis and reliability analyses reported in Table S1. As seen in Table S1, all item factor loadings for single factor solution were above the recommend threshold and ranged from 0.63 to 0.78 in PSAS (Tabachnick & Fidell, 2012). Moreover, a single factor structure accounted for 55.93% of total variance. We also calculated generalized H-index to determine construct replicability of single factor structure for PSAS items (Ferrando & Lorenzo-Seva, 2017, 2018). The generalized H-index was 0.89, indicating a well-defined latent factor structure for PSAS items which is likely to be stable across studies (0.80 or above; Ferrando & Lorenzo-Seva, 2018).

Results of reliability analyses suggested that all PSAS items had adequate corrected item-total correlations ranging from 0.56 to 0.72. Moreover, mean interitem correlation was within the expected range. The coefficient alpha internal consistency reliability coefficient and McDonald's omega reliability coefficient were also good for PSAS (Boateng et al., 2018; Clark & Watson, 1995). Overall, results of construct validity and reliability analyses suggest that PSAS is a valid and reliable scale to measure perceived stigma among Turkish undergraduate students.

2.2.3. Perceived dangerousness

Perceived Dangerousness Scale (Link et al., 1987) was used to measure perceived dangerousness of people who are addicted to alcohol, heroin, and marijuana in various situations that capture the level of threat pose to them and others. In the present study, the term "mentally ill" in Link et al.'s (1987) scale were replaced with "people addicted to alcohol", "people addicted to heroin", "people addicted to marijuana". Moreover, two items were removed from the scale because they described symptoms of mental illness which were not related to substance abuse (Janulis, 2010; Janulis et al., 2013), resulting in the remaining five items. The participants were asked to rate each item on a

six-point Likert-type scale, ranging from Strongly Disagree (1) to Strongly Agree (6). The total scores of each subscale range from 5 to 30, with higher scores indicate higher perceived dangerousness.

2.2.3.1. Construct validity and reliability of perceived dangerousness scales. Different methods of number of factors to retain consistently suggested to extract a single factor in exploratory factor analysis for alcohol, marijuana and heroin perceived dangerousness items. Results of exploratory factor analyses and reliability analyses for perceived dangerousness items for each substance type are reported in Table S2.

As seen in Table S2, all item factor loadings were adequate for single factor structure and ranged from 0.36 to 0.78 for alcohol, 0.33 to 0.90 for marijuana, and 0.37 to 0.90 for heroin perceived dangerousness items. Single factor structure accounted for 51.25% of total variance in alcohol, 62.15% in marijuana, and 64.94% in heroin perceived dangerousness scale. Results of reliability analyses also indicated that all items had acceptable item-total correlations, ranging from 0.31 to 0.64 for alcohol, 0.31 to 0.77 for marijuana, and 0.35 to 0.78 for heroin. Different reliability coefficients were also acceptable and ranged from 0.74 to 0.82 across different substance types. Overall, these findings indicate that perceived dangerousness scales are valid and reliable instruments to measure perceived dangerousness against people with alcohol, marijuana and heroin among Turkish undergraduate students.

2.2.4. Fear reaction

Following Janulis and colleagues (Janulis et al., 2013), three items extracted from Corrigan et al.'s (2002) Attribution Questionnaire was used to measure fear reactions of individuals towards people who are addicted to alcohol, heroin, and marijuana (called Fear Scales). Respondents rate each item on a 10-point Likert-type scale, ranging from Not at all (1) to Very much (10). Possible scores range from 3 to 30 in each scale, with higher scores indicate greater fear of people who are addicted to alcohol, heroin, and marijuana respectively.

2.2.4.1. Construct validity and reliability of fear scales. Results of different tests for number of factors to retain consistently recommended to extract a single factor from alcohol, heroin, and marijuana fear items. Results of exploratory factor analyses and reliability analyses for fear items for each substance type reported in Table S3.

As seen in Table S3, results of exploratory factor analyses suggested that all item factor loading were good for single factor structure, with values ranging from 0.92 to 0.98 for alcohol, 0.96 to 0.99 for marijuana, and 0.95 to 0.98 for heroin. Single factor structure also explained

substantial amount of the total variance in alcohol (94.13%), marijuana (96.30%) and heroin (95.13%) fear scale. Reliability analyses of Fear Scales also indicated that all item-total correlations were high and different reliability indices were excellent in fear scales. Overall, these findings suggest that Fear Scales are valid and reliable instruments to measure fear reactions of undergraduate students against people with substance use problems.

2.2.5. Social distance

A modified version of the Social Distance Scale (Link et al., 1987) was used to measure participants' willingness to engage in relationships with a person who are addicted to alcohol, marijuana and heroin. The original scale (Link et al., 1987), which contained vignette character that was used to measure social distance against people with mental illness was replaced with "a person addicted to alcohol, marijuana, and heroin" in the alcohol, marijuana, and heroin scales, respectively. This scale consists of seven items and the respondents were to indicate their degree of willingness for each item on a four-point Likert-type scale ranging from Definitely willing (0) to Definitely unwilling (3). Possible scores range from 0 to 21 for each scale, with higher scores indicate greater social distance.

2.2.5.1. Construct validity and reliability of social distance scales. Different tests for number of factors to retain consistently recommended to extract a single factor from alcohol, marijuana, and heroin social distance items. Results of exploratory factor analyses and reliability analyses for social distance items for each substance type reported in Table S4.

As seen in Table S4, results of exploratory factor analyses suggested that all item factor loadings were adequate for single factor structure for alcohol, marijuana, and heroin items. Moreover, the proportion of explained total variance were also large: 58.66% in alcohol, 70.57% in marijuana, and 70.97% in heroin social distance scale. Reliability analyses of Social Distance Scales also indicated that all item-total correlations were high and different reliability indices were good to excellent in each of the scale. Overall, these findings suggest that the Social Distance Scales are valid and reliable instruments to measure social distance of undergraduate students against people with alcohol, marijuana and heroin problems.

2.3. Procedure

All study procedures were reviewed and approved by Ondokuz Mayıs University Social Sciences and Humanities Institutional Review Board. To test the feasibility and clarity of all the instruments and to identify possible ambiguous and unclear items, the questionnaires were pilot-tested on five undergraduate students using a paper and pencil survey. All students indicated that all questionnaire items are easy to read and understand.

The participants were recruited online through the university social media platforms. Data were collected through a web-based online survey using Google Forms, which is a free cloud-based data gathering platform. All participants first read and agreed an online informed consent form before answering the questionnaires. Participants were also informed about the purpose and nature of the study, possible risks and benefits and ethical rules. Specifically, researchers give information about the voluntary nature of the study, confidentiality, and their right to withdraw from the study.

2.4. Data analysis

Data were screened, processed, and analyzed using IBM SPSS Statistics 23 for Windows. Preliminary analyses were conducted to examine data accuracy, missing values, univariate and multivariate outliers as well as assumptions of statistical analyses used as suggested by

measurement and evaluation experts (Hair et al., 2018; Tabachnick & Fidell, 2012). Examination of minimum and maximum values and frequency distributions of each variable suggested that all values were within expected range indicating accuracy of data. However, age variable was recategorized using median score as younger students (20 years or below) and older students (21 years or above) for conducting statistical analysis. Data were collected from 550 participants, however, 13 univariate outliers and 24 multivariate outliers were found and removed from the dataset (Hair et al., 2018). Thus, all statistical analyses were based on 513 participants.

Descriptive statistics such as mean, standard deviation, frequencies and percentages were used to give information about sociodemographic characteristics of the undergraduate students. Preliminary analyses were also conducted to examine normality, homogeneity of variance, linearity, homoscedasticity, and multicollinearity assumptions in relevant statistical analyses. A series of independent samples *t*-tests were conducted to examine differences in perceived stigma, perceived dangerousness, fearfulness, and social distance scores with respect to sex and age. When homogeneity of variance assumption was violated, Welch's independent samples *t*-test result was reported. Pearson product moment-correlation analyses were used to examine the strength and direction of linear association between perceived stigma, perceived dangerousness, fearfulness, and social distance scores and to test mediation analyses assumptions in each substance type (Hayes, 2018). Parallel multiple mediation analyses were conducted to determine the strength of the relation among the independent (perceived stigma), mediators (perceived dangerousness, fearfulness), and dependent (social distance) variable using SPSS Process 3.5 macro developed by Hayes (2018). In order to test the significance of indirect effects in mediation models, 95% bias-corrected percentile confidence intervals (CIs) were calculated using 10,000 bootstrap samples (Hair et al., 2018). A significance level of $p < .05$ was used for all inferential statistics.

3. Results

3.1. Sex differences in perceived stigma, perceived dangerousness, fearfulness, and social distance

A series of independent samples *t*-tests were performed to compare sex differences in perceived stigma, perceived dangerousness, fearfulness, and social distance scores. As seen in Table 1, female undergraduate students experienced higher fear toward people who are addicted to alcohol, marijuana and heroin than male undergraduate students. The effect size for these differences were medium. No significant sex differences were found on perceived dangerousness and social distance.

3.2. Age differences in perceived stigma, perceived dangerousness, fearfulness, and social distance

A series of independent samples *t*-tests were performed to examine age differences in perceived stigma, perceived dangerousness, fearfulness, and social distance scores. Results of these analyses showed that younger undergraduate students compared to older undergraduate students perceived people who are addicted to alcohol, marijuana, and heroin as more dangerous and reported being more fearful of people who are addicted to these three substances. Younger undergraduate students also reported having higher social distance towards people who are addicted to alcohol and marijuana than older participants (Table 2). All effect sizes for these differences were small.

3.3. Pearson product-moment correlation analyses

Table 3 shows the means, standard deviations, skewness and kurtosis values and bivariate zero-order correlations between the study variables. Although the strength of association varies across different types of substances, perceived stigma scores were positively correlated with

Table 1
Sex differences in stigmatizing attitudes among undergraduate students.

Variable	Female		Male		df	t	p	d
	M	SD	M	SD				
Perceived stigma	21.59	4.49	21.56	4.38	511	0.08	0.934	0.01
Alcohol								
Perceived dangerousness	20.15	4.99	19.46	5.04	511	1.39	0.165	0.14
Fearfulness	20.14	7.23	15.25	7.78	511	6.70	0.001***	0.66
Social distance	16.83	3.60	16.49	3.51	511	0.95	0.344	0.09
Marijuana								
Perceived dangerousness	22.58	5.00	21.71	5.56	511	1.70	0.090	0.17
Fearfulness	24.39	6.37	19.34	8.27	208.25	6.57	0.001***	0.73
Social distance	18.71	3.20	18.07	3.62	230.02	1.85	0.065	0.19
Heroin								
Perceived dangerousness	22.74	4.93	22.44	5.63	511	0.60	0.548	0.06
Fearfulness	25.05	5.83	20.13	8.08	199.78	6.62	0.001***	0.75
Social distance	17.89	3.08	17.47	3.38	511	1.33	0.185	0.13

Note. d = Cohen's d effect size, ***p < .001.

Table 2
Age differences in stigmatizing attitudes among undergraduate students.

Variable	Younger		Older		df	t	p	d
	M	SD	M	SD				
Perceived stigma	21.95	4.59	21.29	4.32	511	1.68	0.093	0.15
Alcohol								
Dangerousness	20.68	4.86	19.39	5.06	511	2.91	0.004**	0.26
Fearfulness	19.89	7.42	17.91	7.80	511	2.92	0.004**	0.26
Social distance	17.10	3.32	16.45	3.75	511	2.04	0.040*	0.18
Marijuana								
Dangerousness	23.07	4.86	21.75	5.35	502.71	2.92	0.004**	0.26
Fearfulness	24.00	6.95	22.18	7.47	499.41	2.85	0.005**	0.25
Social distance	18.95	2.96	18.20	3.57	510.33	2.58	0.010*	0.22
Heroin								
Dangerousness	23.35	4.67	22.11	5.42	508.06	2.79	0.006**	0.24
Fearfulness	24.54	6.47	23.01	7.14	503.16	2.54	0.011*	0.22
Social distance	18.00	2.87	17.59	3.38	509.01	1.49	0.138	0.13

Note. d = Cohen's d effect size, *p < .05, **p < .01.

Table 3
Pearson product-moment correlations among the study variables.

	1	2	3	4	5	6	7	8	9	10
1. Perceived stigma										
Alcohol										
2. Dangerousness	0.31									
3. Fearfulness	0.19	0.56								
4. Social distance	0.26	0.62	0.56							
Marijuana										
5. Dangerousness	0.35	0.77	0.46	0.53						
6. Fearfulness	0.25	0.44	0.77	0.47	0.55					
7. Social distance	0.32	0.46	0.39	0.71	0.58	0.53				
Heroin										
8. Dangerousness	0.32	0.74	0.40	0.50	0.93	0.49	0.54			
9. Fearfulness	0.25	0.42	0.73	0.45	0.54	0.96	0.52	0.51		
10. Social distance	0.30	0.42	0.32	0.66	0.54	0.44	0.93	0.54	0.47	
M	21.58	19.96	18.79	16.73	22.34	22.99	18.53	22.66	23.69	17.77
SD	4.45	5.01	7.69	3.58	5.17	7.30	3.33	5.13	6.89	3.17
Skewness	-0.48	-0.10	-0.32	-0.70	-0.48	-1.06	-1.20	-0.42	-1.14	-1.31
Kurtosis	0.99	-0.04	-0.84	0.15	-0.20	0.32	0.55	-0.34	0.52	0.90

Note. All correlations are statistically significant at least at p < .001.

perceived dangerousness, fear and social distance. Thus, satisfying the first and the second conditions for mediation analyses. Perceived dangerousness scores strongly correlated with fear and social distance across different substance types. Fear scores were also strongly related to social distance scores with alcohol and marijuana, and moderately related to social distance scores in heroin. Thus, satisfying third condition for mediation analyses.

3.4. Mediation analyses

A series of parallel mediation analyses were performed to test the mediating role of perceived dangerousness and fearfulness between perceived stigma and social distance among different types of substances. As seen in Table 4, the total effect of perceived stigma on social distance was statistically significant for alcohol (B = 0.20, SE = 0.03, p < .001), marijuana (B = 0.24, SE = 0.03, p < .001), and heroin

Table 4
Results of mediation analyses.

	B	SE	t	95% CI		
				p	LB	UB
Alcohol ($R^2 = 0.45$)						
Components						
Perceived stigma → Dangerousness	0.34	0.05	7.23	0.001***	0.25	0.44
Perceived stigma → Fearfulness	0.33	0.08	4.33	0.001***	0.18	0.47
Dangerousness → Social distance	0.30	0.03	10.30	0.001***	0.24	0.36
Fearfulness → Social distance	0.15	0.01	7.84	0.001***	0.10	0.18
Total Effect						
Perceived stigma → Social distance	0.20	0.03	5.96	0.001***	0.14	0.27
Direct Effect						
Perceived stigma → Social distance	0.05	0.03	1.97	0.049*	0.00	0.11
Indirect effects						
Perceived stigma → Dangerousness → Social distance	0.10	0.02			0.07	0.14
Perceived stigma → Fearfulness → Social distance	0.05	0.01			0.02	0.08
Total Indirect effects						
Perceived stigma → Social distance	0.15	0.03			0.10	0.20
Marijuana ($R^2 = 0.41$)						
Components						
Perceived stigma → Dangerousness	0.40	0.05	8.35	0.001***	0.31	0.50
Perceived stigma → Fearfulness	0.42	0.07	5.95	0.001***	0.28	0.55
Dangerousness → Social distance	0.24	0.03	9.02	0.001***	0.19	0.30
Fearfulness → Social distance	0.14	0.02	7.28	0.001***	0.10	0.17
Total Effect						
Perceived stigma → Social distance	0.24	0.03	7.55	0.001***	0.18	0.30
Direct Effect						
Perceived stigma → Social distance	0.08	0.03	3.02	0.003**	0.03	0.14
Indirect effects						
Perceived stigma → Dangerousness → Social distance	0.10	0.02			0.07	0.13
Perceived stigma → Fearfulness → Social distance	0.06	0.01			0.03	0.09
Total Indirect effects						
Perceived stigma → Social distance	0.16	0.02			0.11	0.20
Heroin ($R^2 = 0.35$)						
Components						
Perceived stigma → Dangerousness	0.37	0.05	7.71	0.001***	0.28	0.47
Perceived stigma → Fearfulness	0.39	0.07	5.81	0.001***	0.26	0.52
Dangerousness → Social distance	0.23	0.03	8.72	0.001***	0.18	0.28
Fearfulness → Social distance	0.11	0.02	5.85	0.001***	0.07	0.15
Total Effect						
Perceived stigma → Social distance	0.21	0.03	7.01	0.001***	0.15	0.27
Direct Effect						
Perceived stigma → Social distance	0.08	0.03	3.02	0.003**	0.03	0.13
Indirect effects						
Perceived stigma → Dangerousness → Social distance	0.09	0.02			0.06	0.12
Perceived stigma → Fearfulness → Social distance	0.04	0.01			0.02	0.07
Total Indirect effects						
Perceived stigma → Social distance	0.13	0.02			0.09	0.17

Note. Unstandardized estimates reported in mediation analyses. Indirect effect confidence intervals and standard errors are based on 10,000 bootstrap samples. * $p < .05$, ** $p < .01$, *** $p < .001$.

($B = 0.21$, $SE = 0.03$, $p < .001$). The direct effect of perceived stigma on social distance in alcohol ($B = 0.05$, $SE = 0.03$, $p < .05$), marijuana ($B = 0.08$, $SE = 0.03$, $p < .01$) and heroin ($B = 0.08$, $SE = 0.03$, $p < .01$) was statistically significant while controlling for perceived dangerousness and fearfulness. The overall indirect effect of perceived stigma on social distance through perceived dangerousness and fearfulness was positive and statistically significant in alcohol ($B = 0.15$, $SE = 0.03$), marijuana ($B = 0.16$, $SE = 0.02$) and heroin ($B = 0.13$, $SE = 0.03$) as evidenced by 95% bootstrapped percentile confidence intervals that did not include zero. Moreover, perceived dangerousness and fear were positive and statistically significant mediator in each substance type. However, perceived dangerousness consistently explained the higher variance in mediation relationship than fear in each mediation model. Results of mediation analyses also suggested that the perceived dangerousness and fear explained approximately 75% of total effect in alcohol, 67% in marijuana, and 62% in heroin. All mediation models had a large effect size and proportion of explained variance were 45% in alcohol, 41% in marijuana, and 35% in heroin.

Results of the mediation analyses suggested that perceived dangerousness and fearfulness partially mediated the relationship between

perceived stigma and social distance in alcohol, marijuana and heroin such that perceived stigma increases perceived dangerousness and fear among undergraduate students which in turn led to higher social distance against people who are addicted to alcohol, marijuana and heroin.

4. Discussion

To the best of our knowledge, this is the first study that has examined stigmatizing attitudes among Turkish university students. We examined sex and age differences in stigmatizing attitudes of undergraduate students in Turkey towards people with alcohol, marijuana and heroin addiction and determined a parallel mediation model to explain social distance against people who are addicted to these three substances.

Results of this study suggested that female compared to male undergraduate students have higher fear against people with alcohol, marijuana and heroin problems. This finding was consistent with previous studies among college students showing that female's tendency to experience higher negative emotions against people with substance use problems (Brown, 2011, 2015). Previous research has also suggested that female college students tended to adopt less permissive substance

use norms than their male counterpart (Borsari & Carey, 2001). Research also suggest that life-time use of any substance is more common among male than female college students (İlhan et al., 2008). Thus, unfamiliarity with people with alcohol, marijuana and heroin problems may lead female college students to experience more negative emotions such as fear. However, our findings did not replicate some previous findings on sex differences in social distance among college students (Brown, 2011, 2015; Kruijs & Choi, 2020), but supported other study (Brown, 2015). Reasons for these inconsistent findings are unclear, perhaps reflecting cultural differences in stigmatization attitudes against people with substance use problems.

Younger university students were found to have higher stigmatizing attitudes towards people with substance use problems with notable exception of social distance against people with heroin problems. Specifically, younger undergraduate students perceived people with alcohol, marijuana and heroin problems to be more dangerous and expressed being more fearful of these people. Moreover, younger compared to older undergraduate students have higher social distance against people with alcohol and marijuana problems. Our finding is in agreement with some previous studies (Kruijs & Choi, 2020) which reported age to be weakly and negatively correlated with perceived dangerousness against people with substance use disorder.

Our mediation analyses suggested that perceived stigma was positively associated with perceived dangerousness and fear among university students. These findings are consistent with explanations and predictions of the modified labeling theory regarding perceived stigma process (Link et al., 2018; Link & Stuart, 2017). According to the modified labeling theory, perceived stigma occurs when individuals internalize thoughts, behaviors, feelings, and attitudes towards people with mental illness as the byproduct of the socialization process (Link et al., 2018; Link & Stuart, 2017). This theory also suggests that when perceived stigma occur, individuals also tend to think, feel and behave towards people with mental illness consistent with socially accepted norms. Research suggests that people with substance use problems were perceived as more blameworthy, dangerous, and feared compared to people with physical health and people with other mental health problems (Corrigan et al., 2005, 2009). Due to the prohibition of alcohol, marijuana and heroin use by the Islamic religion and the drug policy in Turkey (Tot et al., 2004), people with substance use problems are often stigmatized by Turkish general public and that they are believed to be dangerous, violent and high criminal propensity similar to findings reported in other countries (Corrigan et al., 2005, 2009; Janulis et al., 2013). Thus, consistent with the societal perceptions towards people with substance addiction, university students may perceive people with alcohol, marijuana and heroin problems as dangerous and may experience negative emotions such as fear towards these people.

Mediation analyses also suggested that perceived stigma increases fear and perceived dangerousness among undergraduate students which in turn increases social distance against people with alcohol, marijuana and heroin disorders. This finding corroborated and extended previous studies by demonstrating direct and indirect effects of perceived stigma on social distance via fear and perceived dangerousness against people who are addicted to alcohol, marijuana and heroin. For example, using a serial mediation model, Janulis et al. (2013) found that perceived dangerousness and fear was positively associated with social distance against people with substance dependency and fear is a mediator between perceived dangerousness and social distance. Our finding extended Janulis et al.'s study (2013) in demonstrating that perceived dangerousness may also be a mediating variable for better understanding to social distance against people with substance problems. Moreover, this is the first study that had examined and demonstrated the negative effects of perceived stigma on social distance such that perceived stigma directly and indirectly intensifies social distance via perceived dangerousness and fear against people with substance use problems. Thus, diminishing perceived stigma may be an important target for reducing social distance against people with alcohol,

marijuana and heroin problems especially among Turkish undergraduate students.

Our study has several methodological limitations which need to be considered when interpreting the findings. Firstly, the cross-sectional design of this study does not allow for testing causality. Secondly, all the participants were undergraduate students and as such could not be regarded as representative of young people in Turkey. Thirdly, this study focused on stigma towards individuals who are addicted to alcohol, marijuana and heroin. As stigma levels seem to be related to different types of illicit drugs, future studies should expand the list of drugs that are also commonly used by young people such as methamphetamines (speed and ice), ecstasy, and cocaine. Finally, stigmatizing attitudes were collected using questionnaires which may not reflect real-life attitudes and behaviours. Furthermore, the questionnaires we used to measure stigmatizing attitudes were developed in the West and is based on Western concept. In order to advance further knowledge in stigma related to drug addiction, it is important to identify the way in which stigma is constructed and acted upon in non-Western cultures such as in Turkey. Such studies would help us illuminate differences and similarities of the various components of stigma (e.g., stereotyping, prejudices, and discrimination) across cultures.

Despite these limitations, our findings have important practical implications for reducing stigmatizing attitudes among university students. Mental health professionals working in universities need to recognize and respond to these stigmatizing attitudes to ensure that students with substance use problems are not hindered in seeking professional support. Because younger compared to older university students were found to generally have more stigmatizing attitudes towards people with substance use problems, educational and psychological interventions should focus on reducing misinformation about people with alcohol, marijuana and heroin problems as well as in increasing appropriate information about the substance use and addiction among younger students. One way to reduce perception of dangerousness and fear among university students would be to use anti-stigma techniques such as facilitating interaction between undergraduate students and people who have alcohol, marijuana, and heroin problems to reduce social distance and increase comfort levels towards these people (Livingston et al., 2012). Future research is needed to develop and examine the effectiveness of such anti-stigma techniques in reducing stigmatizing attitudes of Turkish undergraduate students towards people with illicit substance addiction.

Data Availability Statement

The data that support the findings of this study are openly available in Open Science Framework repository (osf.io/75nct).

CRedit authorship contribution statement

Nursel Topkaya: Project administration, Conceptualization, Resources, Writing – original draft, Writing – review & editing, Methodology, Investigation, Data curation, Formal analysis. **Ertuğrul Şahin:** Writing – original draft, Writing – review & editing, Methodology, Investigation, Data curation, Formal analysis. **Anna K. Krettmann:** Conceptualization, Resources, Writing – original draft, Writing – review & editing. **Cecilia A. Essau:** Writing – original draft, Writing – review & editing.

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. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.abrep.2021.100386>.

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