Original Research

Suicide Risk Screening in Primary Care

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ABSTRACT

Objective: The purpose of this research was to determine the general risk of suicide in the scope of primary health care services and to evaluate its relationship with hopelessness, depression, and psychological resilience.

Methods: Seven hundred twenty-five individuals presenting to primary health care services were included in this descriptive, cross-sectional study. The research data were collected using a form including the sociodemographic information form, the Suicide Probability Scale (SPS), the Beck Depression Inventory, the Beck Hopelessness Scale, and the Brief Psychological Resilience Scale, and were analyzed on SPSS software.

Results: The general SPS score was 69.49±14.65, indicating a moderate likelihood of suicide. Significant predictors of the risk of suicide by effect sizes were, and psychological resilience. Depression level was the most powerful predictor of total SPS scores, followed by hopelessness and psychological resilience.

Conclusion: Screening the risk of suicide in primary health care services is of very great importance. Evaluating the individual's history of attempted suicide, suicidal ideation, and suicide planning provides important information in assessing the likelihood of suicide.

Keywords: Suicide; Primary care; Depression; Hopelessness; Resilience

INTRODUCTION

Suicide is a global public health problem [1]. Due to its life-threatening nature and potential to lead to death and disability, attempted suicide should be dealt with as a matter of urgency in the fields of psychiatry and emergency intervention. Suicide affects all sections of society and was the fourth most common cause of deaths in the 15-29 age group in 2019. Despite its tragic effects on the individual and society, suicide is a public health problem that can be prevented through prompt, minor interventions [2]. According to WHO data, 793,000 individuals worldwide died as a result of suicide in 2016, while according to Centers for Disease Control and Prevention, 47,000 deaths

due to suicide occurred in the USA in 2017, with crude suicide rates of 19.74 per 100,000 in rural areas in the USA in 2013-2015 and 12.72 per 100,000 in urban areas [3]. The equivalent rate in India is 10.6 [4]. According to Turkish Statistical Institute (TSI) data, 3406 suicides occurred in Turkey in 2019, a rate of 4.12 per 100,000. According to TSI data for Batman, where the present study was conducted, 22 individuals lost their lives due to suicide in 2019 [5].

Although risk factors in cases of suicide are usually similar, different causes may sometimes be observed in different societies. While depression and mental diseases are particularly

important as causes of suicide in high-income countries, financial problems and societal events may be more important in middle- and low-income nations [6]. Suicidal behavior is generally significantly associated with causes such as disasters, acts of violence, depression, and stress. Acts of suicide are also more common among vulnerable groups such as refugees, migrants, and the prison population [7].

Retrospective and psychological autopsy studies indicate that a detectable mental disease is present in at least 90% of all completed suicides [8]. A high risk of suicide has been shown in several psychiatric conditions such as personality disorders, schizophrenia, bipolar disorder, and post-traumatic stress disorder [9]. Traumatic events (such as death and war) combined with these diagnoses exacerbate the risk of suicide still further [10]. Several studies have shown that a hopeless mood together with the risk factors described above increase the tendency to suicide [11]. Additionally, hopelessness has been described as a significant predictor of completed suicide among psychiatric patients followed-up for 10-20 years [12].

Systematic research has shown that 80% of suicide cases presented to primary healthcare services within the previous year, and 44% within the previous month. Thirty-one percent of suicides present to mental health services in the previous year [13]. These data show that primary health care services play a critical and life-saving role in suicide risk screenings [14]. Primary health care providers identify only between 24% and 45% of young people in their care who experience emotional distress or suicidal ideation [15]. Primary health care institutions are in an ideal position to identify individuals at risk of suicide and to refer them to mental health services [16]. The purpose of this research was therefore to determine the likelihood of suicide in individuals presenting to primary health care institutions and

Main Points;

- In our study, it was determined that the probability of suicide was moderate in those who applied to primary care.
- Assessment an individual's history of attempted suicide, suicidal ideation, and suicide planning provides important information in terms of suicide risk evaluation in primary health care services.
- While depression and hopelessness are risk factors for suicide; resilience is a protective factor for suicide

to determine the relationship between the likelihood of suicide and hopelessness, depression, and psychological resilience.

MATERIALS AND METHODS

Design The data in this descriptive, cross-sectional research were collected between 30.05.2022 and 15.11.2022. The research population consisted of individuals aged over 15 years presenting to family health centers in the Turkish city of Batman. Inclusion criteria were age over 15, presentation for primary health services in the province of Batman, absence of any difficulty in reading and understanding the study questions, and voluntary participation. Individuals not meeting these criteria were excluded from the research. Epi İnfo (version 7.2.4.0) software was employed to determine the sample size based on the population of the city of Batman, which was 505,849 according to TSI data [5]. Another important parameter in determining the sample was establishing the probability of suicide. Evaluations based on previous academic studies suggest that this is approximately 2-2.5% [17]. We finally aimed to include 659 individuals in the sample, with 90% confidence and a 1% margin of error (α:0.01) using the random sampling method. An additional 20% was added to this figure in the light of potential deficient and inconsistent replies, and the study was completed with 725 individuals.

Data Collection: The data in this research were collected by the authors at face-to-face interviews in a suitable area in the family health center using a form including the sociodemographic information form, the Suicide Probability Scale (SPS), the Beck Depression Inventory (BDI), the Beck Hopelessness Scale (BHS), and the Brief Psychological Resilience Scale (BPRS).

Sociodemographic Information Form: This form developed by the authors consists of 23 questions investigating age, sex, marital status, and experiences concerning daily living activities.

Suicide Probability Scale: The SPS was developed by Cull and Gill [18] and adapted into Turkish by Eskin in 1993 [19]. This four-point Likert-type scale contains 36 items. Atlı et al. performed a validation and reliability study involving a clinical sample in 2009 and showed that it can be applied in diagnosed or undiagnosed individuals [17]. Possible responses on the original version of the scale are 'never or rarely' (1), 'sometimes' (2), 'frequently' (3) and 'generally or always' (4). Possible scores range between 36 and 144, higher scores indicating a greater likelihood of suicide. The original version consists of four

factors – hopelessness (12 items), suicidal ideation (eight items), negative self-evaluation (nine items), and hostility (seven items). The SPS consists of four subscales – hopelessness, suicidal ideation, negative self-evaluation, and hostility, and yields a total scale score. Confirmatory factor analysis was applied for the structural validity in the adaptation study into Turkish, and the four-factor structure was confirmed. Cronbach alpha values at reliability analysis were .78, .94, .79, and .70, respectively, with a general Cronbach alpha value for the scale of .89. In the present study, the scale general Cronbach alpha score was 0.912. A cut-off points of 110 was determined for the scale. Scores between 0 and 24 are regarded as normal, those between 25 and 49 are considered as low risk, scores between 50 and 74 as moderate risk, and scores between 75 and 100 as high risk [18].

Beck Depression Inventory: The BDI was developed by Beck et al. [20] for the purpose of measuring the level and severity of depressive symptoms and to determine risk in the context of depression. The validity and reliability of the Turkish language version were established by Hisli [21]. The Cronbach alpha value is 0.80, while a figure of 0.934 was determined in the present study. This four-point Likert-type scale consists of 21 items scored 0, 1, 2, or 3 (min=0, max=63). Scores of 0-9 indicate minimal depression, 10-16 mild depression, 17-29 moderate depression, and 30-63 severe depression. Higher scores indicate greater experience of depressive feelings.

Beck Hopelessness Scale: The BHS is a self-report inventory developed by Beck et al. [22] to assess the severity of anxiety symptoms. The validity and reliability of the scale were confirmed by Ulusoy et al [23]. The BHS is a one-dimensional 21-item, four-point Likert-type scale, scored from 0 (not at all) to 3 (severely). Total scores range from 0 to 63, with scores of 0–7 indicating minimal anxiety, 8–15 mild anxiety, 16–25 moderate anxiety, and scores of 26-63 a severe level of anxiety. The higher scores indicate a higher level of anxiety symptoms. Scores of 0–7 indicate minimal anxiety, 8–15 mild anxiety, 16–25 moderate anxiety, and 26-63 a severe level of anxiety. Ulusoy et al. determined a Cronbach alpha of 0.93, compared to 0.91 in the present study [23]. In this study the Cronbach alpha is 0.877.

Brief Psychological Resilience Scale: The BPRS was developed by Smith et al. [24] in 2008 for the purpose of measuring individuals' psychological resilience. It was subsequently adapted into Turkish by Doğan [25]. The BPRS is a single-dimension, five-point Likert-type scale. The factor loads of the

scale items range between .63 and .79. The lowest possible score on the scale is 6, and the highest possible score is 30. Higher scores indicate greater psychological resilience. The Cronbach reliability coefficient was 0.83 in the validity and reliability study and 0.752 in the present study.

Statistical Analysis
The study data were evaluated using frequency, percentage, and mean plus standard deviation descriptive methods. Normality of distribution of the scale scores was assessed using skewness and kurtosis values, with values between -1.5 and + 1.5 being regarded as normal. Relationships between normally distributed variables were analyzed using the independent sample t test and ANOVA. Predictors of the likelihood of suicide were determined using a multilinear regression model. p values lower than 0.05 were regarded as statistically significant.

Ethical Issues
Written approval for the study was granted by the Batman University Non-Interventional Clinical Research Ethical Committee (no. 2022/05-06, dated 12.05.2022). Institutional approval was granted by the provincial health directorate to which the family health centers in the research were affiliated (no. E-47960527-774.99, dated 25/05/2022). The study was performed in line with the principal of voluntary participation, written consent being obtained from individuals aged over 18, or from the legal guardians of those aged under 18.

RESULTS
The mean BHS score of the individuals taking part in the study was 7.02±5.05. Most individuals possessed minimal (248) or moderate (231) hopelessness levels. The mean BDI score was 14.49±11.33, minimal depression levels being most common (286 individuals), followed by moderate depression levels (212 individuals). The participant's mean BPRS score was 18.73±4.37, and the mean general SPS score was 69.49±14.65 (Table 1).

No significant correlation was observed between the participants' gender or marital status and total or sub-dimension SPS scores (p>0.05). However, a significant relationship was observed between age and total and sub-dimension SPS scores (p<0.05). Post-hoc analysis was applied to identify the variables from which the significance derived. This showed that this derived from mean hopelessness, hostility, and negative self-evaluation sub-dimension and total SPS scores being significantly lower in the 25-34 age group than in the other age groups (p<0.05). Mean

SPS suicidal ideation scores were only significantly higher in the 15-24 age group compared to the 25-34 age group (p<0.05). The mean suicidal ideation sub-dimension score of participants without children was significantly higher than that of those with children (p<0.05). No significant difference in terms of possession of children was observed in other mean total SPS or sub-dimension scores (p>0.05) (Table 2).

Mean SPS hopelessness and suicidal ideation sub-dimension scores varied significantly depending on education levels (p>0.05). Mean SPS hopelessness subscale scores were significantly higher among uneducated/elementary and middle school graduates than in both the high school and university or above education groups. Mean SPS negative self-evaluation sub-dimension scores were significantly higher among uneducated/ elementary and middle school graduates compared to high school graduates, and in high school graduates compared to participants educated to university level or higher. Mean total SPS scores were significantly lower among those educated to university level or higher compared to uneducated/elementary and middle school graduates (p<0.05) (Table 2).

No significant relationship was observed between income status and mean suicidal ideation or hostility sub-dimension scores (p>0.05). Mean hopelessness and negative self-evaluation sub-dimension and total SPS scores were significantly higher in the group whose income was lower than outgoings compared to the income higher than or equal to outgoings groups. Participants with jobs or occupations registered significantly lower mean hopelessness and hostility sub-dimension and total SPS scores than those with no job or occupation (p<0.05) (Table 2).

Total SPS scores and hopelessness, suicidal ideation, and hostility sub-dimension scores were significantly higher in patients reporting a psychiatric disorder than in those with no psychiatric disease (p<0.05), although no difference was detected in terms of the negative self-evaluation SPS sub-dimension. Only negative self-evaluation scores were higher among participants with a chronic disease compared to those without (p<0.05), with no difference being observed between the two groups in terms of total SPS or other sub-dimension scores (Table 3).

Table 1. Descriptive statistics regarding the scales employed

Scale (n)	(Min-Max)	X̄ ± SD
BHS Total (725)	(0-20)	7.02 ±5.05
Minimal Hopelessness (248)	(0-3)	1.71 ±0.96
Mild Hopelessness (186)	(4-8)	5.76 ±1.39
Moderate Hopelessness (231)	(9-14)	11.14 ±1.60
Severe Hopelessness (60)	(15-20)	17.01 ±1.41
BDI Total (725)	(0-60)	14.49±11.33
Minimal Depression (286)	*(0-9)*	*3.58±3.08*
Mild Depression (148)	*(10-16)*	*12.87±1.95*
Moderate Depression (212)	*(17-29)*	*22.31±3.65*
Severe Depression (79)	*(30-60)*	*36.08±5.90*
BPRS_Total (725)	(6-30)	18.73±4.37
SPS_Total (725)	(36-118)	69.49±14.65
SPS Hopelessness Sub-dimension (725)	*(12.47)*	*24.72±6.35*
SPS Suicidal Ideation Sub-dimension (725)	*(8-32)*	*11.44±3.77*
SPS Hostility Sub-dimension (725)	*(7-28)*	*11.15±3.34*
SPS Negative Self-Evaluation Sub-dimension (725)	*(9-36)*	*22.16±5.23*

Table 2. An evaluation of sociodemographic variables and mean SPS scores

Variables	SPS Hopelessness		SPS Suicidal Ideation		SPS Hostility		SPS Negative Self-Evaluation		SPS Total	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Gender										
Female (440)	24.95	6.17	11.40	3.47	11.22	3.12	22.38	5.22	69.97	14.25
Male (285)	24.37	6.61	11.49	4.20	11.04	3.66	21.83	5.24	68.76	15.25
Test value(t/p)	*1.197*	*.232*	*-.318*	*.750*	*.682*	*.495*	*1.380*	*.168*	*1.085*	*.278*
Marital Status										
Married (165)	24.15	6.72	10.93	3.99	11.06	3.72	22.39	5.48	68.55	15.62
Single (560)	24.89	6.23	11.59	3.69	11.18	3.22	22.10	5.16	69.77	14.36
Test value (t/p)	*-1.317*	*.188*	*-1.953*	*.051*	*-.384*	*.701*	*.630*	*.529*	*-.935*	*.350*
Children										
With children (131)	23.82	6.35	10.57	3.32	10.93	3.40	22.51	5.53	67.84	14.92
No children (594)	24.92	6.34	11.63	3.84	11.20	3.33	22.09	5.16	69.85	14.58
Test value (t/p)	*-1.805*	*.072*	*-2.930*	*.003****	*-.844*	*.399*	*.847*	*.397*	*-1.423*	*.155*
Age										
15-24 years[a] (464)	25.20	6.25	11.73	3.80	11.32	3.26	22.11	5.23	70.39	14.31
25-34 years[b] (189)	23.25	6.08	10.67	3.53	10.46	3.36	21.69	4.95	66.09	14.15
35 years or over[c] (72)	25.52	7.09	11.56	3.94	11.80	3.52	23.75	5.69	72.65	16.63
Test value (F/p)	*7.044*	*.001****	*5.381*	*.005****	*6.208*	*.002****	*4.105*	*.017***	*7.764*	*.000****
Post-hoc (Tukey)	a>b c>b		a>b		a>b c>b		c>a c>b		a>b c>b	
Education Level										
None/elementary/ middle school[a] (66)	25.86	6.12	11.74	3.40	12.34	3.69	24.75	4.93	74.71	14.19
High school[b] (120)	24.58	6.62	11.35	4.06	10.77	3.35	23.23	5.16	69.94	15.06
University or above[c] (539)	24.62	6.31	11.42	3.75	11.09	3.27	21.61	5.16	68.75	14.51
Test value (F/p)	*1.159*	*.314*	*.249*	*.780*	*5.128*	*.006****	*14.058*	*.000****	*4.975*	*.007****
Post-hoc (Tukey)	-		-		a>b a>c		a>c b>c		a>c	
Income Status										
Income<Outgoings[a] (273)	25.76	6.51	11.63	3.59	11.40	3.34	22.77	5.27	71.57	14.78
Income = Outgoings[b] (273)	23.63	5.80	11.18	3.83	10.91	3.19	21.64	4.85	67.38	13.67
Income>Outgoings[c] (79)	23.63	6.66	11.43	4.35	10.81	3.76	21.12	6.00	67.00	16.02
Test value (F/p)	*10.395*	*.000****	*1.132*	*.323*	*2.144*	*.118*	*5.474*	*.004****	*7.874*	*.000****
Post-hoc (Tukey)	a>b a>c		-		-		a>b a>c		a>b a>c	
Employment/Occupation Status										
Working/Employed (264)	23.96	6.27	11.18	3.84	10.60	3.10	21.82	4.91	67.58	14.38
Not Working/Employed (461)	25.16	6.36	11.59	3.73	11.46	3.43	22.36	5.40	70.58	14.71
Test value (t/p)	*-2.470*	*.014***	*-1.389*	*.165*	*-3.341*	*.001****	*-1.319*	*.188*	*-2.664*	*.008****

t: Independent sample t test   F: One-Way Analysis of Variance (ANOVA) p: Significant Value

***p < 0.01, **p < 0.05.

Table 3. Relationships between health status and other variables and mean SPS scores

Variables	SPS Hopelessness		SPS Suicidal Ideation		SPS Hostility		SPS Negative Self-Evaluation		Total SPS	
	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	S.D
Psychiatric disease										
Yes (21)	30.33	8.38	15.42	6.17	13.95	4.93	24.19	5.67	83.90	16.09
No (704)	24.56	6.21	11.32	3.61	11.07	3.25	22.10	5.21	69.06	14.40
Test value (t/p)	*3.130*	*.005****	*3.030*	*.007****	*2.659*	*.015***	*1.662*	*.111*	*4.636*	*.000****
Chronic disease										
Yes (56)	26.14	6.25	11.03	3.21	11.35	3.15	24.01	5.17	72.55	14.43
No (669)	24.61	6.35	11.47	3.81	11.13	3.36	22.01	5.21	69.23	14.65
Test value (t/p)	*1.735*	*.083*	*-.840*	*.401*	*.472*	*.637*	*2.764*	*.006***	*1.627*	*.104*
Familial relationships										
Good[a] (493)	23.30	6.01	10.63	3.22	10.42	2.99	20.80	4.99	65.16	13.27
Average[b] (216)	27.67	5.81	13.01	4.17	12.53	3.37	24.94	4.46	78.17	13.00
Poor[c] (16)	29.06	8.10	14.93	5.17	15.00	4.73	26.62	5.16	85.62	13.79
Test value (F/p)	*44.038*	*.000****	*40.916*	*.000****	*45.845*	*.000****	*61.850*	*.000****	*85.107*	*.000****
Post hoc (Tukey)	*c>a b>a*		*c>b>a*		*c>b>a*		*c>b>a*		*c>b>a*	
Friend relationships										
Good[a] (448)	23.36	6.19	10.72	3.44	10.35	3.00	20.69	5.08	65.13	13.51
Average[b] (264)	26.90	5.95	12.46	3.90	12.29	3.36	24.45	4.44	76.13	13.41
Poor[c] (13)	27.53	6.66	15.23	5.05	15.61	3.92	26.46	6.52	84.84	16.83
Test value (F/p)	*29.180*	*.000****	*26.037*	*.000****	*44.811*	*.000****	*54.343*	*.000****	*63.289*	*.000****
Post hoc (Tukey)	*c>a b>a*		*a>b>c>*		*c>b>a*		*c>b>a*		*c>b>a*	
Health status										
Good[a] (324)	22.29	6.00	10.26	3.10	9.89	2.80	20.33	5.32	62.79	12.81
Average[b] (357)	26.18	5.75	12.18	3.90	11.96	3.26	23.36	4.55	73.69	13.40
Poor[c] (44)	30.86	5.81	14.04	4.40	13.86	4.02	26.00	4.96	84.77	13.09
Test value (F/p)	*62.755*	*.000****	*36.312*	*.000****	*54.745*	*.000****	*46.168*	*.000****	*90.305*	*.000****
Post hoc (Tukey)	*c>b>a*		*c>b>a*		*c>b>a*		*c>b>a*		*c>b>a*	
Regular nutrition										
Yes[a] (199)	20.78	5.21	9.89	2.73	9.29	2.55	20.54	5.52	60.51	11.65
No[b] (240)	27.79	6.49	12.92	4.23	12.67	3.45	24.12	4.87	77.51	14.38
Sometimes[c] (286)	24.90	5.42	11.27	3.52	11.17	3.07	21.65	4.81	69.01	12.92
Test value (F/p)	*81.049*	*.000****	*39.132*	*.000****	*65.808*	*.000****	*29.870*	*.000****	*91.871*	*.000****
Post hoc (Tukey)	*b>c>a*		*b>c>a*		*b>c>a*		*b>c>a*		*b>c>a*	
Sufficient rest										
Yes (344)	22.92	5.89	10.81	3.50	10.32	3.11	21.04	5.28	65.11	13.65
No (381)	26.35	6.31	12.01	3.92	11.90	3.37	23.17	4.98	73.45	14.41
Test value (t/p)	*-7.546*	*.000****	*-4.313*	*.000****	*-6.544*	*.000****	*-5.579*	*.000****	*-7.979*	*.000****

t: Independent sample t test   F: One-Way Analysis of Variance (ANOVA) p: Significant Value

***p < 0.01, **p < 0.05.

Table 4. Analysis of suicidal ideation and behaviors and mean SPS scores

Variables	SPS Hopelessness		SPS ideation		Suicidal SPS Hostility		SPS Negative Self-Evaluation		Total SPS	
	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD
Previous attempted suicide										
No (701)	24.47	6.13	11.23	3.53	10.98	3.12	22.13	5.21	68.82	14.12
Yes (24)	32.20	8.12	17.41	5.41	16.12	5.29	23.25	5.93	89.00	16.80
Test value (t/p)	*6.005*	*.000****	*8.241*	*.000****	*7.696*	*.000****	*1.029*	*.304*	*6.837*	*.000****
I sometimes think about killing myself										
No (669)	24.45	6.15	11.06	3.25	10.98	3.15	22.14	5.22	68.65	14.09
Yes (56)	30.65	7.68	19.59	4.88	14.81	4.90	22.59	5.47	87.65	15.09
Test value (t/p)	*-5.506*	*.000****	*-14.096*	*.000****	*-6.506*	*.000****	*-.470*	*.639*	*-7.433*	*.000****
Have you ever thought about killing yourself?										
No (669)	24.36	6.07	11.05	3.22	10.92	3.08	22.12	5.21	68.46	13.83
Yes (56)	32.30	7.43	19.66	4.91	15.96	4.77	23.12	5.73	91.06	14.96
Test value (t/p)	*-7.255*	*.000****	*-14.557*	*.000****	*-8.912*	*.000****	*-1.070*	*.285*	*-8.502*	*.000****

***p < 0.01, **p < 0.05.

Table 5. Multilinear regression analysis of SPS scores according to BDI, BHS, and BPRS scores

	B	Sh	ß	t	p	R	R^2	F	P
BDI	0.733	0.037	0.567	19.728	.000***				
BHS	0.787	0.084	0.272	9.358	.000***	0.679	0.678	508.101	.000***
BPRS	-0.306	0.084	-0.091	-3.661	.000***				

***p < 0.01, **p < 0.05.

Hopelessness sub-dimension scores were significantly higher among participants with poor relationships with family, friends, and neighbors compared to those with moderate or good relationships (p<0.05). Suicidal ideation, hostility, and negative self-evaluation and total SPS scores were significantly higher among participants poor relationships with family, friends, and neighbors compared to those with good and moderate relationships, and among those with moderate relationships compared to the good relationships group (p<0.05). Mean total SPS and sub-dimension scores were significantly higher among participants describing their health as poor compared to those describing it as moderate or good and among those describing it as moderate compared to those with poor health (p<0.05) (Table 3).

Mean total SPS and sub-dimension scores were significantly higher among participants reporting eating regularly compared to those reporting eating regularly or sometimes regularly, and among those reporting sometimes eating regularly compared to those not eating regularly (p<0.05) Finally, mean total SPS and sub-dimension scores were significantly higher among individuals not able to devote sufficient time to resting compared to those able to rest sufficiently (p<0.05) (Table 3).

Participants who had previously attempted suicide, and those with ideations concerning suicide and how to kill themselves registered significantly higher SPS hopeless, suicidal ideation, and hostility sub-dimension and total SPS scores (p<0.05). However, these negative ideations and behaviors caused no difference in the mean negative self-evaluation sub-dimension (Table 4).

Statistically significant results were obtained in the multilinear regression model established with mean BDI, BHS, and BPRS scores as predictors of SPS scores (F: 508.101; p:0.000). The

three variables together explained 67.8% of the variance in mean SPS scores. Each also emerged as a significant predictor of SPS when the three were analyzed individually (p<0.05). BDI exhibited the highest predictive level (ß:0.567), followed by BHS (ß:0.272), and BPRS (ß:-0.091) (Table 5).

DISCUSSION

Approximately 80% of suicide cases have been reported to present to primary health care services within the preceding year, a finding that reveals the importance of suicide screening in primary health institutions [16]. The mean general SPS score in the present study was 69.49±14.65, indicating a moderate probability of suicide in primary presentations. Research from Turkey involving individuals diagnosed with psychiatric diseases revealed a mean SPS score of 70.97±12.82, a figure close to the value in the present research [26]. Another study from Turkey reported a mean SPS score of 71.03±15.85 in individuals diagnosed with a psychiatric disease, compared to 60.86±11.13 in those with no such disease [17].

No significant relationship was determined between gender and SPS scores in this study. Analysis of deaths from suicide in 2019 in the province where this research was conducted showed that gender rates were very similar to one another (male 22, female 18) [5]. Studies investigating the relationship between suicide and gender report that males are at greater risk [27, 28]. However, there are also studies reporting more attempted suicides among women. Research reported that 9.2% of women and 3.6% of men presenting to primary health services in India had previously attempted suicide. A retrospective study performed in an emergency department also reported that women were at a greater risk of suicide [29]. Another aspect of the association between suicide and gender is that the risk of attempts being successful is 2.83-fold higher in men than in women [11]. It should also be remembered in suicide risk assessment that men may be less likely to mention their suicidal ideations [30].

No significant association was observed in this study between the participants' marital status and their SPS scores. Marriage provides some degree of protection against suicide [31], although a marriage involving a high rate of conflict or violence can also act as a risk factor for suicide [32]. It is therefore misleading to regard being married as a protective factor against suicide.

Total SPS and sub-dimension scores were generally significantly lower among participants in the 25-34 aged group compared to those aged 15-24 or 35 and over. Negative self-evaluation scores were higher in the 35 and over age group compared to the other groups. One study involving TSI suicide data for 2007-2016 reported that suicides were most frequent in the 20-24 age range, but also increased with age after 35 [33]. Suicide is an one of the most frequent causes deaths among young people and adolescents [34]. In addition, records show that the most common age for suicides in Turkey is 20-24 [5]. Our results are consistent with the previous literature and confirm that young people and adolescents are particularly vulnerable in terms of the risk of suicide. In addition, the significant elevation in negative self-evaluation scores among individuals over 35 in the present study shows that such self-evaluation increases with age. This suggests that age-dependent feelings of inadequacy and negative ideation may be associated with an increased risk of suicide.

Participants without children in this study registered significantly higher SPS suicidal ideation sub-dimension scores than those with children. Previous studies have also identified having children as a protective factor against suicide [27, 35]. Interestingly, although possession of children is a protective factor against suicide and attempted suicide, stress associated with bringing up children can also increase the risk of suicide [34].

Total SPS and hostility and negative self-evaluation sub-dimension scores increased as participants' education levels decreased. No relationship was determined between education level and mean SPS hopelessness and suicidal ideation scores. The higher likelihood of suicide attempts resulting in death or severe injury in individuals with low education levels supports our finding [11]. It is important to bear in mind the association between a high level of education and economic status when assessing the risk of suicide. This should also be evaluated in terms of individuals with a high level of education also enjoying better economic status.

Individuals with low levels of income in this research registered lower total SPS and hopelessness, hostility, and negative self-evaluation sub-dimension scores than those with moderate and high incomes. Individuals with jobs or occupations had lower total SPS and hopelessness, and hostility sub-dimension scores than those with no job or occupation. These findings show that a low economic status and income increase the risk of suicide. It should be noted that, since public awareness and knowledge

of individuals having an academic education, a lower mortality rate because of suicide is seen as low educational status may result in inadequate job opportunities, economic problems, inefficient coping styles with problems and addiction; all these can worsen consequences in suicide [11].

While participants reporting a psychiatric disorder registered higher total SPS and hopelessness, suicidal ideation, and hostility sub-dimensions scores than those with no psychiatric disorder, no difference was found between the two groups in terms of negative self-evaluation sub-dimension scores. Retrospective and psychological autopsy studies show that a diagnosable mental disease is present in at least 90% of all completed suicides [8]. Evidence from a 10-year prospective study evaluating suicidal ideation, and suicide plans and attempts revealed that the total number of psychiatric disorders emerging at the same time is a more consistent predictor of subsequent suicidal behavior than the type of psychiatric disorder involved [9].

Only SPS negative self-evaluation scores were higher among participants with a chronic disease than in those with no such disease. Individuals describing their health status as poor registered significantly higher total SPS and sub-dimension scores than those describing it as moderate or good. In support of these findings, one study retrospectively investigating suicide attempts among adolescents with chronic disease showed that individuals with chronic diseases were at a greater risk of both single and multiple attempts at suicide, and had a 6.14-fold greater risk of multiple attempts than healthy individuals [28]. Other research involving individuals hospitalized due to medical disease confirmed that 62.9% of individuals at risk of suicide (73/116) exhibited 'thoughts of harming oneself or of being better off dead' on PHQ-9 [36]. Determining the risk of suicide only by means of depression screening tools in inpatient units may not be sufficient to identify adult medical inpatients at risk of suicide. Direct questions about the risk of suicide and using validated tools are essential for effectively and productively screening for the risk of suicide in this population [36].

Participants with poor relationships with family, friends, and neighbors registered higher total SPS and all sub-dimension scores than those with moderate or good such relationships. Similarly, a lower risk of attempted suicide has been reported in adolescents with a combination of powerful family ties and an effective neighbor network [37]. A cross-sectional study of depressed patients with no previous history of attempted suicide

determined that these felt greater responsibilities towards their children and families, feared social exclusion, were skeptical about suicide for religious reasons, and exhibited greater survival and coping skills [38]. Healthy and well developed coping skills can provide a buffer against stressful life events and reduce the likelihood of suicide [39].

Participants with regular eating habits registered higher total and sub-dimension SPS scores that those eating only sometimes regularly or irregularly. The total SPS and sub-dimension scores of participants who were able to devote sufficient time to resting were significantly higher than those of individuals who were not able to rest sufficiently. In agreement with our findings, effective health care is regarded as a protective factor against suicide [40].

Participants with histories of attempted suicide, suicidal ideation, and suicide planning registered higher total SPS and suicidal ideation, hopelessness, and hostility sub-dimensions scores, although such ideations and behavior caused no significant difference in mean negative self-evaluation scores. The most powerful risk factor for suicide is a previous history of attempted suicide [2, 41]. A five-year follow-up study showed that individuals with a single previous attempt at suicide had a 48-fold greater probability of suicide than average individuals [42]. An epidemiological study of 18,199 cases of attempted suicide conducted in Finland reported a 30% risk of repeat attempts within five years and a 10% mortality risk due to suicide [43]. A significantly greater probability of poor suicide outcomes has been shown in individuals with ideation and histories of attempted suicide [11]. Although attempted suicide is an important risk factor for future suicide, that risk is far from definite [44]. Suicide risk assessment involving a few questions such as history of attempted suicide, current suicidal ideation, and plans for suicide can be a useful guide for health care professionals in terms of a rapid evaluation in areas involving only brief stays, such as primary health services.

BDI, BHS, and BPRS emerged as significant predictors of total SPS scores in this research. BDI was the most powerful predictor of total SPS scores, followed by BHS, and BPS. The previous literature shows that major depression is a risk factor for suicide, and is responsible for 60% of suicides [36,45], although depression screening by itself does not determine the entire risk [14]. Many commonly cited risk factors for suicide, such as depression, hopelessness, psychiatric disorders, and impulsivity, are best thought of as predictors of suicidal ideation [27]. Early

diagnosis and treatment of depressive and suicidal symptoms should therefore constitute a component of suicide prevention programs [11]. There is a confirmed association between hopelessness and suicide [12,26,41]. Research investigating the relationship between trait hopelessness and suicide has revealed significant positive correlation between trait hopelessness scores and attempted suicide, while state anxiety was only positively correlated with responses to the suicidal ideation question "In the last year, have you ever felt that life is hardly worth living?" [46]. It may therefore be misleading to evaluate suicide risks using state anxiety only. Based on the findings of the present study, psychological resilience if a protective factor against the risk of suicide. In support of this finding, studies involving individuals with psychiatric diagnoses have shown that psychological resilience reduced the risk of suicide [26, 47].

Limitations

There are a number of limitations to this research. First, since it was conducted in primary health services in a single province, the results cannot be generalized to all of Turkey or to other health institutions. The second limitation was that the determination of depression, hopelessness and psychological resilience was not based on a clinical interview. Another limitation is that the risks of suicide among individuals presenting to primary health care services but refusing to take part in the study could not be determined. This limits the data concerning suicide risk in individuals who presented to primary care services and did not participate in the research. Finally, the determination of suicide risk in this research was not based on a structured clinical interview.

CONCLUSION

Assessment an individual's history of attempted suicide, suicidal ideation, and suicide planning provides important information in terms of suicide risk evaluation in primary health care services. Assessment using these three questions is both practical and can assist health care professionals in primary care to perform further evaluation of the risk of suicide or to refer the patient to a psychiatrist. The SPS is the most valid and reliable method for determining the risk of suicide and can provide detailed information in the assessment of that risk in primary health care services. Depression and hopelessness are important risk factors for suicide, for which reason suicide risk evaluation should be performed as a matter of urgency in individuals with depression or hopelessness. However, although it is important to determine depression and hopelessness in evaluating suicide

risk in primary health care services, these may not be sufficient by themselves for determining that risk. Psychological resilience is a protective factor against suicide, although it is important for risk factors and protective factors to be considered as an integral whole in assessing the risk of suicide. Therefore, health professionals working in primary health care services should be trained on the importance and implementation of suicide risk assessment. In future studies to be conducted on the subject, it is recommended that patients with high suicide risk in primary health care services and referred to psychiatrists should be followed up and long-term results should be evaluated.

REFERENCES

[1] LeCloux MA, Weimer M, Culp SL, Bjorkgren K, Service S, Campo JV (2020) The Feasibility and Impact of a Suicide Risk Screening Program in Rural Adult Primary Care: A Pilot Test of the Ask Suicide-Screening Questions Toolkit. Psychosomatics. 61(6):698-706. https://doi.org/10.1016/j.psym.2020.05.002

[2] World Healt Organization (WHO). Available from: https://www.who.int/news-room/fact-sheets/detail/suicide

[3] Ivey-Stephenson AZ, Crosby AE, Jack SP, Haileyesus T, Kresnow-Sedacca MJ (2017) Suicide Trends Among and within Urbanization Levels By Sex. Race/ethnicity, Age Group, and Mechanism of Death—United States. 2001–

2015. MMWR CDC Surveill Summ. 66(18):1–16. https://doi.org/10.15585/mmwr.ss6618a1

[4] National Crime Records Bureau Report. 2014. Ministry of Home Affairs. Govt of India. Available from: https://ncrb.gov.in/en/crime-india-year-2014

[5] Turkish Statistical Institute (TSI) (2019) Available from https://data.tuik.gov.tr/Bulten/Index?p=Olum-ve-Olum-Nedeni-Istatistikleri-2019-33710

[6] Tanaka H, Nusselder WJ, BoppnM, Brønnum-Hansen H, Kalediene R, Lee JS, Mackenbach JP (2019) Mortality Inequalities by Occupational Class among Men in Japan. South Korea and Eight European Countries: A National Register-Based Study. 1990–2015. J Epidemiol Community Health. 73(8):750-758. https://doi.org/10.1136/jech-2018-211715

[7] Martínez-Alés G, Jiang T, Keyes KM, Gradus JL (2020) The Recent Rise of Suicide Mortality in the United States. Annu Rev Public Health. 43:99-116. https://doi.org/10.1146/annurev-publhealth-051920-123206

[8] Conwell Y. Duberstein PR. Cox C. Herrmann JH. Forbes NT. Caine ED (1996) Relationships of Age and Axis I Diagnoses in Victims of Completed Suicide: A Psychological Autopsy Study. Am J Psychiatry. 153:1001-1008. https://doi.org/10.1176/ajp.153.8.1001

[9] Borges G, Angst J, Nock MK, Ruscio A, Kessler RC (2008) Risk Factors for the Incidence and Persistence of Suicide-Related Outcomes: A 10-Year Follow-Up Study Using the National Comorbidity Surveys. J Affect Disord. 105:25–33. https://doi.org/10.1016/j.jad.2007.01.036

[10] Eskin M, Sun JM, Abuidhail J, Yoshimasu K, Kujan O, Janghorbani M, Voracek M (2016) Suicidal Behavior and Psychological Distress in University Students: A 12-Nation Study. Arch Suicide Res. 20(3):369-388. https://doi.org/10.1080/13811118.2015.1054055

[11] Yazdi-Ravandi S, Khazaei S, Shahbazi F, Matinnia N, Ghaleiha A (2021) Predictors of Completed Suicide: Results From the Suicide Registry Program in the west of Iran. Asian J Psychiatr. 59:102615. https://doi.org/10.1016/j.ajp.2021.102615

[12] Beck AT, Brown G, Steer RA (1989) Prediction of Eventual Suicide in Psychiatric Inpatients by Clinical Ratings of Hopelessness. J Consult Clin Psychol. 57(2):309–310. https://doi.org/10.1037/0022-006X.57.2.309

[13] Stene-Larsen K, Reneflot A (2019) Contact with Primary and Mental Health Care Prior to Suicide: A Systematic Review of The Literature From 2000 to 2017. Scand J Public Health. 47(1):9-17. https://doi.org/10.1177/1403494817746274

[14] Horowitz LM, Mournet AM, Lanzillo E, He JP, Powell DS, Ross AM, Pao M (2021) Screening Pediatric Medical Patients for Suicide Risk: Is Depression Screening Enough?. J Adolesc Health. 68(6):1183-1188. https://doi.org/10.1016/j.jadohealth.2021.01.028

[15] Taliaferro LA, Borowsky IW (2011) Perspective: Physician Education: A Promising Strategy to Prevent Adolescent Suicide. Acad Med. 86(3):342-347. https://doi.org/10.1097/ACM.0b013e31820984ad

[16] Ayer L, Horowitz, LM, Colpe L, Lowry NJ, Ryan PC, Boudreaux E, Little V, Erban S, Ramirez-Estrada, Schoenbaum M (2022) Clinical Pathway for Suicide Risk Screening in Adult Primary Care Settings: Special Recommendations. J Acad Consult Liaison Psychiatry. 63(5):497-510. https://doi.org/10.1016/j.jaclp.2022.05.003

[17] Atlı Z, Eskin M, Dereboy Ç (2009) The Validity and the Reliliability of Suicide Probability Scale (SPS) in Clinical Sample. Turkish J Clin Psychol. 12(3):111-124.

[18] 18.Cull JG, Gill WS (1982) Suicide Probability Scale. APA PsycTests. https://doi.org/10.1037/t01198-000

[19] Eskin M (1993) Reliability of the Turkish Version of the Perceived Social Support from Friends and Family Scales, Scale for Interpersonal Behavior, and Suicide Probability Scale. J Clin Psychol. 49(4):515-522. https://doi.org/10.1002/1097-4679(199307)49:4<515::AID-JCLP2270490408>3.0.CO;2-K

[20] Beck AT (1984) Internal Consistencies of the Original and Revised Beck Depression Inventory. J Clin Psychol. 4(6):1365-1367. https://doi.org/10.1002/1097-4679(198411)40:6<1365::AID-JCLP2270400615>3.0.CO;2-D

[21] Hisli N (1989) A Reliability and Validity Study of Beck Depression Inventory in a University Student Sample. J Psychol. 7(23):3-13.

[22] Beck AT, Weissman A, Lester D, Trexler L (1974) The Measurement of Pessimism: The Hopelessness Scale. J Consult Clin Psychol. 42(6):861. https://doi.org/10.1037/h0037562

[23] Ulusoy M, Şahin N, Erkman H (1998) Turkish Version of The Beck Anxiety Inventory: Sychometric Properties. J. Cogn. Psychother. 12:28-35.

[24] Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Jennifer Bernard J (2008) The Brief Resilience Scale: Assessing the Ability to Bounce Back. Int J Behav Med. 15:194–200. https://doi.org/10.1080/10705500802222972

[25] Doğan T (2015) Adaptation of the Brief Resilience Scale into Turkish: A Validity and Reliability Study. JHWB. 3(1):93-102.

[26] Çapar A, Cuhadar D. (2022) Correlation between psychological resilience and suicide probability in patients with psychiatric disorder. Perspect Psychiatr Care. 58:1442–1448. https://doi.org/10.1111/ppc.12948

[27] Ayhan F, Üstün B, Ergüzel TT (2020) The Development of a Fuzzy Logic Model-Based Suicide Risk Assessment Tool. JNBS. 7(3):156-163. https://doi.org/10.4103/jnbs.jnbs_30_20

[28] Tubaş F, Husrevoglu Esen F, Öztelcan Gündüz B, Ünay B (2022) Youth Suicide and Hospital-Presenting Suicide Attempts: Examination of Risk Factors for Multiple Suicide Attempts in Adolescence. Int J Soc Psychiatry. 68(5):1047-1053. https://doi.org/10.1177/00207640221099415

[29] Vannoy SD, Robins LS (2011) Suicide-Related Discussions with Depressed Primary Care Patients in the USA: Gender and Quality Gaps. A Mixed Methods Analysis. BMJ Open. 1(2):e000198. https://doi.org/10.1136/bmjopen-2011-000198

[30] Zeppegno P, Gramaglia C, Castello LM, Bert F, Gualano MR, Ressico F, Coppola I, Avanzi GC, Siliquini, R, Torre E (2015) Suicide Attempts and Emergency Room Psychiatric Consultation. BMC Psychiatry. 15(1):13. https://doi.org/10.1186/s12888-015-0392-2

[31] Kposowa AJ (2000) Marital Status and Suicide in the National Longitudinal Mortality Study. J Epidemiol Community Health. 54(4):254-261.

[32] American Psychiatric Association (2003) Practice Guidelines For The Assessment and Treatment of Patients with Suicidal Behaviours. Am J Psychiatry. 160(11):1-60. https://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/suicide.pdf

[33] Alptekin K, Duyan V (2019) What Was the Distribution of Suicide Rates by Socio-Demographic Factors Between 2007 and 2016 in Turkey?. J Psy Nurs. 10(4):270-276. https://doi.org/10.14744/phd.2019.59354

[34] Karakurt MD (2015) Analysis of Sociodemographic Data of the Patients Admitted to a State Hospital Because of Suicide Attempt. Gaziantep Med J. 21(2):104-107. http://dx.doi.org/10.5455/GMJ-30-601

[35] Genest C, Ricciardelli R, Carleton RN (2021) Correctional Work: Reflections Regarding Suicide. Int J Environ Res Public Health. 18(8):4280. https://doi.org/10.3390/ijerph18084280

[36] Mournet AM, Smith JT, Bridge JA, Boudreaux ED, Snyder DJ, Claassen CA, Horowitz LM (2021) Limitations of Screening for Depression as a Proxy for Suicide Risk in Adult Medical Inpatients. J Acad Consult Liaison Psychiatry. 62(4):413-420. https://doi.org/10.1016/j.jaclp.2021.02.002

[37] Maimon D, Browning CR, Brooks-Gunn J (2010) Collective Efficacy, Family Attachment, and Urban Adolescent Suicide Attempts. J Health Soc Behav. 51(3):307–324. https://doi.org/10.1177/0022146510377878

[38] Malone KM, Oquendo, MA, Haas GL, Ellis SP, Li S, Mann JJ (2000) Protective Factors Against Suicidal Acts in Major Depression: Reasons for Living. Am J Psychiatry. 157:1084–1088. https://doi.org/10.1176/appi.ajp.157.7.1084

[39] Josepho SA, Plutchik R (1994) Stress, Coping, and Suicide Risk in Psychiatric Inpatients. Suicide Life Threat Behav. 24:48–57. https://doi.org/10.1111/j.1943-278X.1994.tb00662.x

[40] Suicide Prevention Resource Center. Available from: https://www.sprc.org/about-suicide/risk-protective-factors

[41] Franklin JC, Ribeiro J, Bentley KH, Huang X, Musacchio KM, Chang BP, Fox KR, Kleiman EM, Jaroszewski AC, Nock MK (2017) Risk Factors for Suicidal Thoughts and

Behaviors: A Meta-Analysis of 50 Years of Research. Psychol Bull. 143(2):187–232. https://doi.org/10.1037/bul0000084

[42] Beautrais AL (2004) Further Suicidal Behavior among Medically Serious Suicide Attempters. Suicide Life Threat Behav. 34:1–11. https://doi.org/10.1521/Suli.34.1.1.27772

[43] Haukka J, Suominen K, Partonen T, Lonnqvist J (2008) Determinants and Outcomes of Serious Attempted Suicide: A Nationwide Study in Finland. 1996–2003. Am J Epidemiol. 167:1155–1163. https://doi.org/10.1093/Aje/Kwn017

[44] Fowler CJ (2012) Suicide Risk Assessment in Clinical Practice: Pragmatic Guidelines for Imperfect Assessments. Psychotherapy. 49(1):81–90. https://doi.org/10.1037/a0026148

[45] Indu PS, Anilkumar TV, Pisharody R, Russell PSS, Raju D, Sarma PS, Andrade C (2017) Prevalence of Depression and Past Suicide Attempt in Primary Care. Asian J Psychiatr. 27:48-52. https://doi.org/10.1016/j.ajp.2017.02.008

[46] Burr EM, Rahm-Knigge RL, Conner BT (2018) Conner the Differentiating Role of State and Trait Hopelessness in Suicidal Ideation and Suicide Attempt. Arch Suicide Res. 22(3):510-517. https://doi.org/10.1080/13811118.2017.1366960

[47] Matel-Anderson DM, Bekhet AK, Garnier-Villarreal M (2019) Mediating Effects of Positive Thinking and Social Support on Suicide Resilience. West J Nurs Res. 41:25–41. https://doi.org/10.1177/0193945918757988