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The Association Between Anhedonia, Suicide Ideation, and Suicide Attempts: A Replication in a Persian Student Sample

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Research suggests that anhedonia, a common symptom of depression, may be uniquely associated with suicidal behavior. However, little research has examined this association across cultures. To address this limitation, this study attempted to replicate a recent anhedonia and suicide study (conducted in a western culture) in a Persian sample using the Specific Loss of Interest and Pleasure Scale, Persian version. Participants consisted of 404 students who were recruited from a Persian university. Surprisingly, our results indicated that anhedonia levels were more than double those found in similar American student sample. Despite this marked difference in anhedonia symptoms, we found that anhedonia was associated with suicide risk, even when it was statistically accounting for other depressive symptoms. These findings suggest that anhedonia is a robust predictor of suicide risk across these two cultures. Further, anhedonia may be a particularly important treatment target among Persian students.

Suicide is an escalating public health problem in both the United States (U.S.) and Persia. In the United States, suicide accounts for over 44,000 deaths annually (rate = 13.8 per 100,000), with the suicide rate increasing each year for more than the last decade (Drapeau & McIntosh, 2016). In Persia, although the rate is lower than in the United States, suicide is still a meaningful problem with estimates suggesting that as many as 17 people take their lives each day (rate = 5.3 per 100,000), and it is reported that is increasing every year (Mirhashemi, Kalantar Motamedi, Mirhashemi,

Taghipour, & Danial, 2016). Further, there is reason to believe that due to cultural differences, suicide is greatly under-reported in Persia. There are also seasonal differences in suicide between the United States and Persia. Instead of spring having the highest suicide rate, as is the case in the United States, summer has been reported as a season when the highest suicide rate is reported in Persia, with the rate being approximately 13% higher than in other seasons (Ghafarian Shirazi et al., 2012). Thus, although similar, suicide manifests differently in Persia, and thus studies

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testing whether findings generalize across cultures are warranted.

Anhedonia, defined as the loss of interest and/or pleasure in things, actions, and people, has recently emerged in the U.S. literature as a meaningful predictor of psychopathology and suicidality (Treadway, Bossaller, Shelton, & Zald, 2012; Treadway & Zald, 2011, 2013; Wardle, Treadway, Mayo, Zald, & de Wit, 2011; Winer, Veilleux, & Ginger, 2014). For instance, Yen and colleagues demonstrated that anhedonia predicts subsequent suicide-related events (e.g., suicide attempt or intervention to prevent a suicide attempt) even after controlling for suicide ideation (Yen et al., 2013). Winer, Nadorff, et al. (2014) also found that anhedonia was linked with suicidality in both cross-sectional and longitudinal analyses of an inpatient sample. Moreover, they found that changes in anhedonia from baseline to termination could predict changes in suicidality, as well as level of suicidality at termination. In a sample including 40 depressed outpatients and 20 healthy controls, those with high levels of suicide ideation and former suicidal behaviors were less to respond to rewarding stimuli task assessing anhedonia (Xie et al., 2014). It is possible that the association between anhedonia and suicide may be explained in part by acquired capability, as Spitzer and colleagues recently found that anhedonia was positively associated with acquired capability for suicide (Spitzer, Zuromski, Margaret, Witte, & Weathers, 2017).

Although the anhedonia and psychopathology/suicide literature are strong and growing, little research on these associations has been carried out outside of the United States. Given the notable differences in suicide between the United States and Persia, one cannot assume that the risk and protective factors identified in U.S. samples will generalize to Persian samples. As such, the purpose of this study was to examine the relation between anhedonia and suicidal behavior in a Persian sample. To do this, we conducted a replication of

Winer, Drapeau, Veilleux, and Nadorff (2016), which found that anhedonia was associated with both suicidal risk and suicide attempts even when controlling for other depressive symptoms. As such, the present investigation has two hypotheses: 1. we predict that anhedonia will be significantly associated with suicide risk independent of depressive symptoms, and 2. we predict that anhedonia will be significantly associated with past suicide attempts independent of depressive symptoms.

METHODS

Participants

Participants were 404 students of Kashan University located in center of Persia, which is diverse university and is, thus, viewed as an appropriate sample to utilize to generalize to Persia as a whole (Izadi-Avanji, Kondabi, Afazel, Akbari, & Zeraati-Nasrabady, 2017). Our sample reported an age range of 18–32 years (Mean age 20.40 years, and SD 2.64) and was predominately female (67%). Participants utilized paper and pencil to complete the study.

Measures

The Specific Loss of Interest and Pleasure Scale (SLIPS; Winer, Veilleux et al., 2014). The SLIPS is a 23-question self-report measure that detects variations in the ability to get interested or take pleasure in people or events. The SLIPS is scored on a four-point scale (0–3), with responses of “3” recoded as “0” to limit trait anhedonia responses and emphasize recent feelings of anhedonia, resulting in a range of 0–46. The SLIPS evidenced a high level of internal consistency and has been validated as a measure of recent changes in anhedonia symptoms (Winer et al., 2016; Winer, Veilleux et al., 2014). For this study, the SLIPS scale was translated to Persian by Ahmad and Vahid Daghigh and then discussed to be localized based on the Persian community sample in counseling

with Professor Mohsen Niazi, chair of the sociology department in Kashan University. In our sample, the mean was 11.35 (SD = 12.66) and reliability was strong ($\alpha = 0.94$).

The Center of Epidemiological Studies Depression Scale (CES-D; Radloff, 1977); The CES-D is a 20-item self-report scale for measuring symptoms of depression. The CES-D is scored on a four-point scale (0–3), with a range of 0–60. A cutoff score of 16 is usually exerted for demonstrating clinically significant depressive symptoms (Radloff, 1977) and has shown strong internal consistency for both the general (0.85) and clinical (0.90) populations (Radloff, 1977). Similar to the SLIPS, the CES-D was translated by the first and second authors, and was reviewed by Professor Mohsen Niazi. Questions pertaining to anhedonia were removed from the CES-D scale (items 8 and 12) to diminish possible overlap with the SLIPS. After removing these items, the mean in our sample was 4.74 (SD = 2.92), including acceptable reliability ($\alpha = 0.78$).

The Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001). The SBQ-R is a revised survey based upon the Suicidal Behaviors Questionnaire (Linehan & Nielsen, 1981) that is designed to measure suicide risk. It is a four-item self-report measure comprised of one's suicide ideation, past suicidal behavior, and self-rated to engage in suicidal behavior in the future. The SBQ's four items are summed to compose a total index in which the scores range from 3 to 18. A cutoff score of 7 for the general sample or 8 for psychiatric inpatients might be applied for denoting clinically significant amount of suicide risk (Osman et al., 2001). It has demonstrated strong reliability with an alpha Cronbach of 0.88 in a clinical sample and 0.87 in a nonclinical sample (Osman et al., 2001). In this present research, the SBQ-R was translated to Persian. Further, item 1 responses referring to ideation and attempts (responses "5" and "6") were recoded as "4" so that they were independent of actual behaviors as measured by suicide attempt history (see below). In the present sample, the

mean was 4.47 (SD = 2.92) as well as acceptable reliability ($\alpha = 0.78$).

RESULTS

Suicidal Risk

To examine the relation between anhedonia and suicidal risk, we conducted a multiple regression analysis with anhedonia and depressive symptoms as independent variables and suicide risk the dependent measure. Surprisingly, scores on our measure of suicide risk were normally distributed, so no data transformation was necessary for the dependent variable. The overall regression was significant, $F = (46.77)$, $p < .001$, $R^2 = 0.185$. Moreover, as predicted, anhedonia was associated with suicidal risk ($\beta = 0.109$, $t = 2.177$, $p = .030$), independent of other symptoms of depression ($\beta = 0.375$, $t = 7.470$, $p = .001$). Thus, anhedonia, when holding all other symptoms of depression constant, was associated with suicidal risk. Results of this part have been presented in Tables 1 and 2.

Suicide Attempts

To investigate the relation between anhedonia and suicide attempts, we utilized a logistic regression analysis with anhedonia and other symptoms of depression as independent variables and suicide attempts as the dependent measure. The omnibus logistic model was significant $\chi^2 (2, N = 404)$

TABLE 1
Regression Analysis for Relation of Anhedonia and Suicide Ideation

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.424	.180	.178	2.65030
2	.435	.189	.185	2.63805

1. Predictors: (constant), depression with eliminated items.

2. Predictors: (constant), depression, Anhedonia.

= 44.296, $p < .001$. Similarly, like suicide risk, other symptoms of depression (Wald = 8.32, $p = .004$), as well as anhedonia (Wald = 17.415, $p = .000$), reached significance. In Table 3, the logistic regression has been presented which shows the chi square number and the strength of the relationships.

DISCUSSION

In line with previous research, we found that anhedonia was associated with suicide risk independent of other depressive symptoms.

Another interesting finding is that symptoms of anhedonia were twice as high in Persia as they are in the United States, and yet the correlation between anhedonia and suicide was lower than was found in a U.S. sample (Winer et al., 2016). Although we cannot be sure why this may be from the present study, there are several factors that likely play a role.

First, many in Persia are finding that their religious values and beliefs are not

consistent with the modern day world. Specifically, it is common for Persians to believe that they will be rewarded for the pain and suffering that they have endured, although in recent times this reward has not come, leading to feelings of disillusionment. Further, the Persian people are facing significant stressors such as high rates of inflation and unemployment. To cope with being unable to progress, and not being reinforced for one's suffering, it is possible that Persian people may be dissociating from the things they previously liked or enjoyed so as to not be reminded of their struggles.

Further research is needed to examine anhedonia in Persian samples, as well as to better understand its relation with psychopathology. For anyone living in Persia, fighting for psychological and economic survival is an undeniable reality of life, inasmuch as if the one wants to surrender the lack of pleasure and enjoyment, he or she would be unable to survive in chaotic perplexity of Persian society and its typical life style. Hope is commonly punishing due to negative outcomes, which may result in Persians losing

TABLE 2
The Omnibus Logistic Model

Model	Unstandardized coefficients		Standardized coefficients	<i>t</i>	Sig.
	B	Std. error	Beta		
1 Depression with eliminated items	.124	.013	.424	9.380	.000
2 Depression with eliminated items	.110	.015	.375	7.470	.000
Anhedonia	.025	.012	.109	2.177	.030

Dependent variable: suicide risk.

TABLE 3
Omnibus Tests of Model Coefficients

	B	SE	Wald	df	Sig.	Exp (B)
Step 1 ^a						
Eliminated depression sum	.070	.012	33.742	1	.000	1.072
Constant	-2.191	.221	98.355	1	.000	.112
Step 2 ^b						
Eliminated depression sum	.055	.013	17.415	1	.000	1.056
Anhedonia sum	.028	.010	8.322	1	.004	1.029
Constant	-2.355	.232	102.694	1	.000	.095

^aVariable(s) entered on step 1: E.D.Sum.

^bVariable(s) entered on step 2: A.Sum.

interest in pleasant things because looking forward to such things has been punished in the past. Further, when one is struggling for survival, attending to pleasant things can be challenging. Further, religiosity may also play a role, although its impact has been understudied in the Persian community. The interaction of these factors is likely what leads to high rates of anhedonia and may also help explain suicidality among Persians. Further research is needed to examine the interplay of these variables in the hopes of better understanding the mechanisms of the relations so as to hopefully be able to design interventions tailored to the mechanism.

Limitations

This recent investigation was limited by taking place at just one university at one time point. However, the fact that our findings replicated those done in a different culture (Winer et al., 2016) reduces this limitation and demonstrates the robustness of anhedonia playing an important role in the association between depression and suicidality. Second, the study would have been improved by assessing religiosity, as religion plays a vital role in Persian culture and likely affects both levels of suicidality and anhedonia. Future research examining these effects

would greatly enhance the literature. Lastly, our study relied upon self-report measures that were translated from English to Persian. However, to minimize the effects of this, we started with strong, well-validated English measures. These measures were translated by two native Persian speakers (the first two authors) and the translation was examined by a third person, Professor Mohsen Niazi (the third author), chair of the sociology department in Kashan University. As such, we believe that the translation was accurate, and the findings presented above are valid and representative of the Persian people.

CONCLUSION

The result of this work offers essential evidence regarding the linkage between anhedonia and suicide ideation in Persia, extending the work of Winer et al. (2016), who found similar relations in the United States. Anhedonia was associated with suicide ideation in this study, as well as suicidal behaviors. These findings, as well as the high rate of anhedonia in our sample, indicate that anhedonia is a significant problem for many Persian individuals. Further research examining anhedonia, and ways to reduce it among Persian individuals, is warranted.

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