Original Article

A casual model for predicting suicidal risk in university students of Honduras

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Abstract

Introduction: The purpose of the study was to determine the casual relationships between hope, interpersonal support, seeking for meaning, presence of meaning, gratitude, loneliness and depression over suicidal risk of under graduate psychology students.

Materials and Methods: This was accomplished through a quantitative method, with a non-experimental design and an explanatory scope, in sample of 117 university students. The path analysis was made using a casual structural equations model.

Results: The results provide evidence to support the predictive direct effects of depression, loneliness and search for meaning, as well as inverse effects of interpersonal support and hope over suicidal risk. However, gratitude and presence of meaning did not have significant effects over suicidal risk. The model accounts for 31% of the variance of suicidal risk.

Conclusion: The study of suicidal risk must be approached holistically, considering psychological, existential and social variables. These results are discussed according to their implications and consistency with prior studies.

Keywords: Depression, Hope, Mental health, Loneliness, Suicide.

Introduction

Suicide can be defined as a type of death that occurs because of self-inflected damaging behavior, done with the explicit purpose of dying. On the other hand, suicide attempts consist of damaging self-directed behavior, committed with the intent of dying, but with a nonfatal resolution. Another related construct is suicidal ideation, defined as thoughts, considerations, or making plans about committing suicide (1). The assessment of suicide risk must consider both the wish to live and the wish to die, history of past suicide attempts, self-reported prediction of future suicide attempts, and the presence of internal debates around life and death (2).

There is a close relationship between suicide risk and mental health. For instance, thoughts of death, suicide ideation, and attempts are diagnostic criteria for major depression disorders. However, the expression of these may occur from passive stances (for example, unwillingness to wake up or thoughts that other people's lives will improve if he or she was

dead) to more active behaviors like debt settling, attaining materials needed to commit suicide, and arranging a time and a place to attempt it (3).

Among the factors that can motivate suicide is the will to surrender or end to what is perceived as unbearable obstacles or painful emotions and the thought that the future will not be enjoyable and that he or she is a burden to others (3). In this sense, there is also a significant inverse relationship between hope and depression. Subjects with depression elaborate expectations about the future with the belief they will experience less festive events and more negative events than people without a depression diagnosis (4).

Given that depression is associated with suicidal risk, it is essential to consider how other variables, such as loneliness, influence depression itself. In this sense, research has shown that loneliness has a moderately significant prediction over depression (5). Also, certain conditions, such as living alone, are also considered a risk factor for suicide (3). In this sense, interpersonal support, particularly from friends and family, is a significant predictor of loneliness, accounting for up to 36% of its variance (6).

Additionally, previous research has found that meaning in Life is a negative predictor of depression and suicide risk (7). Nevertheless, there is an evidence to support that meaning in life can be categorized into two factors, presence of meaning and search for meaning. Studies have shown that meaning negatively correlates with sadness and depression, while the search for meaning correlates positively with both constructs (8).

Other studies have shown that gratitude significantly predicts depression, nine, but there is evidence that claims that gratitude correlates negatively with suicidal ideation, but not with suicide attempts. However, when controlling for depression, the impact of gratitude loses statistical significance (10).

Furthermore, there is a positive relationship between gratitude and the presence of meaning in life (11).

However, depression is not the only mental disorder associated with suicide. Also, subjects with schizophrenia have a high probability of attempting suicide; hallucinations may influence this behavior. On the other hand, people living with bipolar disorder have 15 times more risk of committing suicide than the general population, accounting for 25% of all suicides. Also, compared to the general population, people with a specific phobia are 60% more likely to attempt suicide. Other disorders associated with a higher suicidal risk include body dysmorphic disorder, post-traumatic stress disorder, dissociative identity disorder, dissociative amnesia, anorexia nervosa, bulimia nervosa, alcohol, and inhalant use disorder, and specific learning disorders (3). In Honduras, by the year 2017, there were 33 registered suicides every month, and the number is increasing compared to 2016. At a national level, the suicide rate is 5.1 cases for every 100,000 inhabitants. The most common way to commit suicide was by choking and hanging, followed by intoxication and suicide by fire gun. The age range with the highest rate was between 15 and 29 years and accounted for more than 46% of all suicides. Also, suicide was more common in men (77.3%) than in women (22.7%) (12).

A study made in pediatric patients of the Hospital Escuela Universitario, showed that the most frequent suicidal motivation corresponds to problems with the family (53%), followed by a psychiatric disorder (17%). Among the psychological factors linked to suicide attempts, the most common correspond to depressive symptoms (20.4%) and low self-esteem (19.7%) (13).

Given this, the purpose of the current research is to establish a causal multivariate model capable of predicting suicidal risk in undergraduate students of the National Autonomous University of Honduras, considering the effects of hope, interpersonal support, search for meaning, presence of meaning, gratitude, and depression in this model design.

Materials and Methods
This research was methodologically based upon a quantitative approach, using a non-experimental design with a causal scope. Explanatory attributions regarding suicidal risk were made through a maximum likelihood path analysis, complemented with bootstrapping of 200 samples. The model included hope, interpersonal support, search for meaning, and gratitude as direct independent variables. Loneliness, meaning, and depression were mediators, while the suicidal risk was the dependent variable. To approximate the sample size needed in the path analysis, the

partial correlation sampling formula suggested by Green was used (14). In which: n ≥104 + number of predictors, the constant sample size needed to achieve a medium effect, is 104, plus the seven predictors included in this study, equals 111 cases. However, the final sample consisted of 117 undergraduate students of the School of Psychological Sciences of the National Autonomous University of Honduras.

They were selected through simple random sampling. Out of the 117 students, 72.6% were females and 27.4% males, with an average age of 23.13 years (SD=5.85). Before the sample selection, participants were asked to sign an informed consent, which provided details regarding the study's purpose, confidentiality, results in management, and information to allow them to contact the principal researcher.

Data was collected through self-reported scales, previously validated by different authors. So, they were applicable items with negative orientation were inversely recoded.

Research instrument

A) The Meaning in Life Questionnaire (MLQ): It is a 10-item scale with Likert scale responses. It consists of two subscales: presence of meaning (α=0.86), and search for meaning (α=0.87) (8).

B) The Support Evaluation List-12 (ISEL-12): It is validated in Spanish speaking Latinos. It consists of 12 items, with a Likert type response set. Researchers report acceptable internal consistency coefficients for the total scale (α>0.70) for the Spanish-speaking samples (15).

C) The Herth Hope Index: This index is validated in a Peruvian non-clinical sample. This scale consists of 10 items, with a Likert type response structure. The authors report good internal consistency scores (α=0.85) and definite construct validity obtained through factor analysis (16).

D) The Short-Form UCLA Loneliness Scale (ULS-6): The scale consists of six items, with a unidimensional structure and a Likert-type response setting. Researchers have reported an adequate internal consistency coefficient such as Cronbach's alpha (0.73) and a mean correlation between items of 0.31 (17).

E) Gratitude Questionnaire (GQ-6): The authors of this self-reported scale suggest a unidimensional structure, which has been confirmed using factor analysis; the GQ-6 also possesses acceptable discriminant and convergent validity levels. The scale consists of 6 items, with a Likert scale rating system (18).

F) The Patient Health Questionnaire (PHQ-9): It is a nine-item self-administered test based upon the DSM-IV diagnostic criteria. Studies have shown its reliable validity, and reliability, suggesting its use for diagnostic and research purposes (19). It was used to measure depression in this research.

G) The Suicidal Affect-Behavior-Cognition Scale (SABCS): It includes six self-reported items. The authors report high reliability (α >0.86) as well as high predictive validity (2).

All data were collected by a professional psychologist trained in crisis intervention if there was an emotional crisis during the scale applications. Subjects were required to sign an informed consent before their inclusion in the study. Once the minimum sample was exceeded, all data were processed using SPSS 22 and Amos Graphics 3.

Results

The Suicidal Affect-Behavior-Cognition Scale used to evaluate suicidal risk consisted of six items aim to know past behaviors, suicidal thoughts, wish to live, wish to die, and possible future behaviors. When asked if they ever had either thought or attempted to commit suicide, 34.5% reported they never had, 36.2% answered that it was only a passing thought, 12.1% said they have had a plan at least once to commit suicide but did not execute it, 6% reported to have attempted suicide but did not want to die, 6.8% of the sample said they have had a plan to commit suicide and wanted to die and finally, 4.3% of the subjects have attempted suicide with a willingness to die.

On a scale of zero (never) to five (very often), when asked about how often during the last year have they thought about committing suicide, the average answer was 1.52 (SD=1.04), with 4.3% of the sample reporting this thought to be present very often. Complementarily, when asked if during the last year they had experienced an internal debate about whether to live or die, the average answer was 1.91 (SD=1.32), with 9.4% of the subjects reporting it to be a frequent thought.

On the other hand, the wish to live had a mean of 4.48 (SD=0.90), whereas the wish to die had a lower score (M=1.30, SD=0.73); as was expected, there was a negative and statistically significant correlation between the two constructs (rho= -0.66, P=0.00). Lastly, on a scale from zero (not at all), to five (very likely), when asked about how likely they were to

attempt suicide someday, the average answer was 1.45 (SD=0.95), with 2.6% of the sample reporting it to be very likely.

All these individual items were combined to create the suicidal risk variable with a lower limit of 1 (low risk) and an upper limit of 5 (high risk), where the average score was 1.65 (SD=0.86); they wish to live item was inversely recoded.

Additionally, when analyzing depression, according to the PHQ-9 scoring criteria (20), 25.7% of the sample had no symptoms, whereas 25.7% showed mild symptoms, 23% of the sample had moderate depression, 15.9% reported moderately-severe symptoms, and 9.7% severe symptoms. For a statistical description of all remaining predictors, see Table 1.

Table 1. Descriptive statistics for the variables included in the study

Variable	Mean	Standard deviation
Gratitude	4.40	0.53
Hope	4.22	0.62
Loneliness	2.30	0.86
Interpersonal support	3.91	0.74
Presence of meaning	3.87	0.81
Search for meaning	3.66	0.83

Note. For comparison purposes, all scales were standardized to have a minimum score of 1 and a maximum of 5.

The causal analysis of suicide predictors was made through a Structural Equation Model, using estimates based on maximum likelihood. The resulting model had an acceptable fit, $X2$ (9, n=117)= 8.28, P =0.51. Besides the Chi-squared test, the model also had a good global fit regarding other indices specified in Table 2.

Table 2. The goodness of fit for the suicidal risk causal model

Index	Value	Cutoff value	Implication
Root Mean Square Error of Approximation (RMSEA)	0.00	RMSEA<0.08	
Comparative Fit Index (CFI)	0.98	CFI≥0.95	
Standardized Root Mean Squared Residual (SRMR)	0.02	SRMR close to zero	Acceptable
Goodness of Fit (GFI)	0.98	GFI>0.95	

Note. Table 2 reports the resulting fit indexes of the casual model for suicidal risk. The cutoff values for the indices are those suggested in the literature (21,22).

To analyze the effect that the predictors had over the dependent variables, we obtained the determination coefficient (r2). For loneliness, the standardized estimate was of 0.45, 95% CI [0.32, 0.53], while the presence of meaning had an estimate of 0.41, 95% CI [0.28, 0.51]. The model accounted for 31% of the variance of depression scores, r2= 0.31, 95% CI [0.21, 0.40]. Moreover, the determination coefficient for suicidal risk was 0.30, 95% CI [0.18, 0.40]. The confidence intervals for the standardized estimates were calculated using the biased-corrected percentile method; the complete path analysis can be viewed in Figure 1.
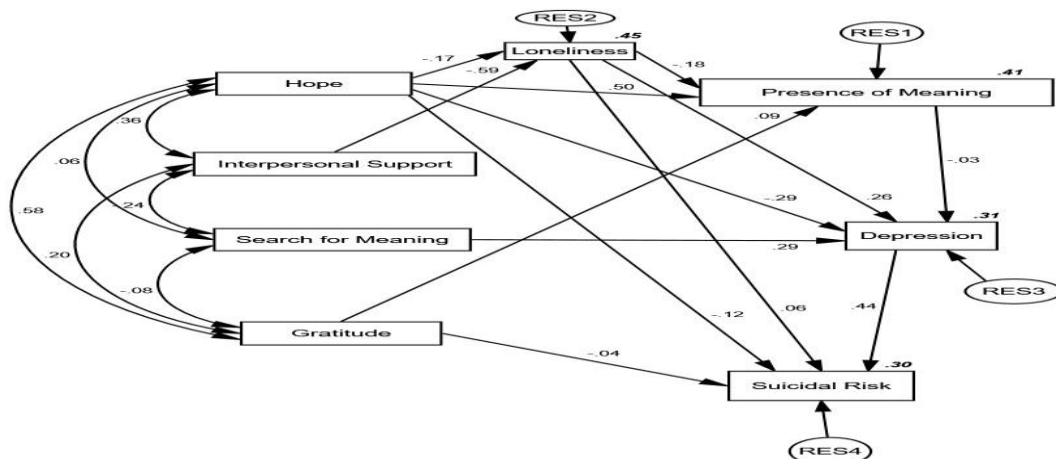

Figure 1. Path diagram for all variables included in the model

Each dependent variable is also plotted with its residual. Significant covariances between variables include: hope and gratitude (*P*=0.00), hope and interpersonal support (*P*=0.01), search for meaning and interpersonal support (*P*=0.01) and gratitude and interpersonal support (*P*=0.03). There was no significant covariance between hope and search for meaning (*P*=0.48) nor between search for meaning and gratitude (*P*=0.30). Specifically, regarding direct effects, increments on perceived interpersonal Support, along with negative scores on hope, were significant predictors of loneliness.

On the other hand, the presence of meaning in Life was directly and significantly predicted by inverse scores in loneliness and direct scores of hope, while gratitude did not affect it. Additionally, increments in loneliness and search for meaning, alongside decreases in hope, directly explain depression.

However, the presence of meaning did not have a significant direct effect on it. Lastly, the suicidal risk was mostly predicted by depression, while not directly affected by loneliness, hope, or gratitude. The detail of the direct effects is presented in Table 3.

Table 3. Standardized direct effects

Dependent variable	Predictor	Standardized direct effect	95% CI	*P*
Loneliness	Interpersonal support	-0.59	[-0.69, -0.49]	0.03*
	Hope	-0.17	[-0.33, -0.04]	0.03*
Presence of meaning	Gratitude	.09	[-0.08, 0.27]	0.37
	Hope	0.5	[0.32, 0.67]	0.01**
	Loneliness	-.18	[-0.33, -0.05]	0.01**
Depression	Loneliness	0.26	[0.12, 0.38]	0.01**
	Hope	-0.29	[-0.46,-0.10]	0.02*
	Search for meaning	0.29	[0.15, 0.43]	0.01**
	Presence of meaning	-0.03	[-0.16, 0.14]	0.93
Suicidal risk	Depression	0.44	[0.30, 0.55]	0.01**
	Loneliness	0.06	[-0.11, 0.21]	0.73
	Hope	-0.12	[-0.31, 0.07]	0.35
	Gratitude	-0.04	[-0.25, 0.15]	0.64

P<0.05. **P*<0.01.

Given the presence of mediators in the causal model, we provide an analysis of indirect effects.

The results indicate that meaning was indirectly affected in a significant way by interpersonal support and hope.

Likewise, interpersonal support indirectly affected depression. Moreover, the suicidal risk was mediated by interpersonal support, search for meaning, hope, and loneliness. These indirect effects and their significance are presented in Table 4.

Table 4. Standardized indirect effects

	Interpersonal support	Gratitude	Search for meaning	Hope	Loneliness	Presence of meaning
Loneliness	-	-	-	-	-	-
Presence of meaning	0.10**	-	-	0.03*	-	-
Depression	-0.16*	0.00	-	-0.06	0.00	-
Suicidal risk	-0.11*	0.00	0.13**	-0.16***	0.12**	-0.01

P<0.05, **P*<0.01, ***P*<0.001

When considering the total effects, the results indicate that loneliness was significantly and inversely predicted by interpersonal support and hope. The presence of meaning was influenced significantly and positively by interpersonal support and hope, and inversely

by loneliness, however, not by gratitude. Depression was positively predicted by searching for meaning and loneliness while being inversely influenced by interpersonal support and hope. Neither gratitude nor presence of meaning showed significant effects

on depression. Finally, the suicidal risk was negatively affected by interpersonal support and hope, while being positively affected by the search for meaning, loneliness, and mostly depression.

Gratitude and presence of meaning had no significant influence on depression. Table 5 includes the standardized effects of all predictors included in the model.

Table 5. Standardized total effects

| | | Dependent variables | | | |
		Loneliness	Presence of meaning	Depression	Suicidal risk
Predictors	Interpersonal support	-0.59*	0.10**	-0.16*	-0.11*
	Gratitude	-	0.09	0.00	-0.04
	Search for meaning	-	-	0.29**	0.13**
	Hope	-0.17*	0.53**	-0.34***	-0.28*
	Loneliness	-	-0.18**	0.27**	0.18*
	Presence of meaning	-	-	-0.03	-0.01
	Depression	-	-	-	0.44**

*P<0.05, **P<0.01, ***P<0.001

Discussion

The current study results indicate the presence of suicide risk and depression in the sample; this is a concern given their future professional role in providing mental health services. Clearly, as human beings, psychologists are also vulnerable to mental health issues, such as suicidality (23). Therefore, the implications of these results suggest that before initiating their professional practice, students might benefit from assisting with psychotherapy.

Additionally, the resulting causal model provides evidence to support the direct role of depression on suicidal risk and total inverse effects of interpersonal Support and hope, combined with total positive effects of search for meaning and loneliness. However, gratitude and the presence of meaning did not have significant effects on suicidal risk. Our research findings are consistent with those of Pervin and Ferdowshi, which concluded that depression, loneliness, and hopelessness could predict suicidal ideation in university students (24). Nevertheless, the lack of a causal link between meaning in life and depression and suicidal risk may be due to depression pathogenesis of the particular sample included in the study. In this sense, a traditional approach is to consider depression as a disorder based on either biological or exogenous factors or an interaction between them. However, depression may also emerge in monogenic neuroses, which are influenced by existential problems (25). Complementarily, the search for meaning influenced depression and suicidal

risk. Therefore the current study may suggest that depression is not necessarily motivated by the individual's current existential state (presence of meaning), but rather by their expectations about finding existential meaning. This constant search for meaning may suggest an unwillingness to accept the status quo, building expectations that "the grass is always greener on the other side of the fence" as a utopic construct, and therefore resulting in a frustrating search. The lack of covariance between the search for meaning and hope could support this notion of a utopic search. It is worth noticing that studies by Steger et al., have found a positive relationship between the search for meaning and depression, but unlike our study, they also reported a negative correlation between the presence of meaning and depression (8). Therefore, future research should focus on the dynamics between depression, suicide, and meaning in Life, not only from a quantitative methodology but also from a phenomenological design. Complementarily, our findings indicate the inverse effects of hope over depression show coherency with the diagnostic criteria for a major depressive disorder (3). On the other hand, the inverse effect of interpersonal Support, through loneliness, on suicidal risk is of great value when designing suicide prevention programs. Universities should encourage activities and spaces that enhance social network building as an essential point in mental health promotion. Future research should include the impact evaluation of such

interventions. Our study also found no effect of gratitude over a depression or suicidal risk; this is contrary to what other research has concluded however in such studies, the casual dynamic was mediated by self-esteem and well-being, variables not included in our causal model (26). Considering all this, the study of suicidal risk and its predictors should be the primary concern when designing public policy and university welfare programs. In order to minimize suicide rates, preventive actions should promote interpersonal support networks. Also, university health care units must include counselors and psychological therapists with training in logo-therapy and depression. The limitations of the current research include the small, although acceptable sample size. Since all students belong to the undergraduate degree in psychology, the results may differ from other samples. Therefore, the study should be replicated at a greater population scope, including representative samples for the different academic programs available. Another limitation is the lack of standardized

tests made for the Honduran population and the restricted contextual information available in the country regarding suicide in university students. Finally, this study did not consider any socioeconomic variables nor other psychological factors that could improve the predictive capacity of suicidal risk. Future research should also include economic income, housing conditions, self-esteem, well-being, and other mental health indicators.

Conclusion

The results provide evidence to support the direct predictive effects of depression, loneliness, and search for meaning and inverse effects of interpersonal Support and hope over suicidal risk. However, gratitude and the presence of meaning did not have significant effects on suicidal risk. The model accounts for 31% of the variance of suicidal risk. In conclusion, the study of suicidal risk must be approached holistically, considering psychological, biological, existential, and social variables.

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