Social Undermining and Intimate Partner Support Predict Depression in Cancer Patients

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Abstract

Title: This paper describes a cross-sectional analysis of a population of cancer patients in Quito, Ecuador, using surveys to assess depression levels and correlate depression with social support and social undermining.

Background: Rates of depression among cancer patients are higher than in the general population. In Latin America, social support and social undermining are important, though understudied, factors in a patient's mental health status. We assessed depression levels in a population of patients at a cancer hospital in Quito, Ecuador, and examined the association between depression, social support and social undermining. We hypothesized that depression was inversely related to social support levels and directly correlated with levels of social undermining.

Methods and Findings: A total of 298 patients was approached in the waiting rooms of the Sociedad de Lucha Contra el Cáncer (SOLCA) hospital in Quito, Ecuador over a two-month period. Surveys assessing depression, distress level, social support and social undermining were administered using an electronic tablet (iPad) based platform. High depression scores were associated with low levels of social support (p<0.0001) and high levels of social undermining (p<0.0001). Higher depression scores were associated with female gender, low education status and unemployment.

Conclusions: Results of this study indicate that social support and social undermining are important factors in a cancer patient's depression status and that computer-tablet based screening is a cost-effective, rapid, and efficient method to identify patients with major depression who should be targeted for therapy.

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Introduction

Depression is a serious mental health condition affecting 350 million people worldwide [1]. Rates of depression are much higher in cancer patients than in the general population, with one third of cancer patients reporting mild or moderate depression and up to one-third and one-fourth reporting major depression [2]. Cancer patients with major depression score lower on measures of quality of life than those without depression [3,4]. Major depression is associated with elevated mortality risk in cancer patients [5], therefore identification of depression in cancer patients is of critical medical relevance and cancer patients should be frequently screened for depression so that they can receive timely and effective treatment.

In many Latin American countries, the mortality burden is shifting from acute causes such as infectious disease to chronic conditions such as cancer [6]. Efficient cancer screening and treatment protocols are an ongoing challenge in Latin American countries such as Ecuador, with up to 70 percent of cancers diagnosed when the disease has progressed past the curable stage [6]. Deficient cancer screening practices result in increased disease burden. For example, low HPV screening rates contribute to high cervical cancer rates, especially in impoverished areas [6]. In particular, prostate and breast cancer incidence and mortality in Latin America are increasing [7]. Latin American countries have high cancer mortality-to-incidence ratios, likely due to late stage at the time of diagnosis and insufficient access to healthcare [7]. In Ecuador, the mortality-to-incidence ratio of certain cancers is

decreasing, due to gradual improvement in health care services, but at a lower rate compared to other Latin American countries [7].

The relationship between depression and cancer in Latin America is understudied [8]. This may be due to the relatively modest infrastructure for specialized cancer treatment in the region, which has only recently been established. Social support plays an important role in the manifestation of depression in a patient diagnosed with cancer. In Ecuador, as in many other Latin American countries, cultural norms place a strong emphasis on the family as a social support system. Cancer patients with strong social support systems have been shown to have better outcomes than those without social support [4,9-11]. Social undermining is defined as perceived negative behavior or sentiments toward an individual, or negative evaluations of an individual, that impede one's progress toward achieving goals. It may involve criticisms of one's actions, efforts or attributes [12]. Social undermining has been found to negatively affect quality of life in patients with HIV/AIDS [13] and is indirectly implicated in depression status among people living with chronic disease [14]. Studies have shown that in patients with high baseline levels of social undermining undergoing treatment for depression, high social support correlates with increased symptom reduction [12].

This study investigates the correlation between social support, social undermining and depression levels in cancer patients at the Sociedad de Lucha Contra el Cáncer (SOLCA) hospital in Quito, Ecuador. SOLCA is an institution with combined national, academic, and private support with up-to-date technology in the screening, assessment and treatment of cancer patients. The hospital serves a wide economic segment of the population. Our hypotheses build upon the results of previous study phases [15]. We hypothesize that depression is inversely related to social support levels, and that higher depression levels correlate with unemployment and low socio-economic status. This phase of the study adds the additional investigative instrument of social undermining. We hypothesize that increased social undermining correlates directly with higher levels of depression.

Methods

A random sample of 298 patients was approached in the waiting room or during chemotherapy sessions at SOLCA hospital. All patients either had a diagnosis of cancer (85%) or were being seen for cancer screening (15%). After providing informed consent, each participant completed five surveys on a tablet-based (iPad) platform using PollDaddy survey software [16]. All surveys were administered in Spanish. Participants completed a demographics survey that included gender, age, place of birth, current residence, ethnicity, education level, occupation, employment status and marital status. Participants then completed the Patient Health Questionnaire (PHQ-9) [17] to assess depression levels, and the Distress Thermometer instrument [18] to assess levels of distress, depression, anxiety, anger and dependence on help from others. Participants in a committed relationship completed the Experiences in Close Relationships (ECR) [19] survey, which assessed intimate partner social support, and all participants completed the Social Support and Undermining (SSU) [20,21]

instrument, which assessed both social undermining and social support from close friends and family members. In this phase of the study, we used a modified ECR, eliminating questions that participants from previous study phases found culturally inappropriate or confusing due to translation ambiguities. Participants were given a unique identification number to ensure anonymity and data were uploaded to a cloud-based data storage platform nightly to ensure data security.

Descriptive analyses were conducted for demographic factors; frequency, means and standard deviation were reported for categorical and continuous variables, respectively. Correlations between continuous variables were quantified by Spearman's rank correlation coefficients. Two-tailed independent t-tests were used to compare outcomes between levels of the demographic variables. Multiple variable linear regression models were used to analyze associations between variables, while adjusting for demographic factors and other covariates. Statistical analyses were performed using Stata 13.1.

Results

Participant characteristics: Table 1 shows the demographic profile of the participants in the study. The patients in our study represented a broad range of economic and employment statuses, reflective of SOLCA's diverse patient population. Our study population was more female (72.8% vs. 50.3%), older (49.7% vs. 14% over age 55), and had a higher percentage of people of Mestizo ethnicity (84.9% vs. 71.9%) than the general population of Ecuador [22]. **Table 1** also shows the distribution of patients by cancer type. The most common cancer type was breast, followed by gastrointestinal, cervical and prostate.

Depression rates: Overall, 97 (32.7%) of participants were found to have an elevated depression score on screening (defined as a score of 8 or above on the PHQ-9 survey). Compared to the general population of Ecuador, our study sample had a two-fold higher prevalence of depression (32.7% vs. 16%) [23]. Despite these high depression rates, FEW participants had recently received psychiatric attention (20%) (**Table 1**). Women had a statistically significantly higher level of depression than men, as did participants with less than a college education compared to some college or above, and those that were currently unemployed compared to employed (**Table 2**). Participants who were Afro-Ecuadorian, Indigenous, or members of other ethnic groups without European ancestry had higher, but not statistically significantly different depression levels when compared to participants with European ancestry, as did participants from rural areas compared to urban areas. Depression scores via the PHQ-9 correlated statistically significantly with distress scores via the Distress Thermometer (Spearman's rho=0.55, p<0.0001).

Depression and social support: Among those with a romantic partner, low intimate partner support, as measured by the ECR, was inversely related to depression (Spearman's rho=-0.42, p<0.0001) (**Figure 1**). These results held true after adjusting for possible confounders such as age, gender, ethnicity, education level, employment status, marital status, residential area (urban vs. rural), cancer status and recent psychiatric assessment (**Table 3**). Participants with low social support as measured by

Table 1 Participant Demographic and Medical Characteristics (N=298).

	N	Percent (%)
Mean Age, in Years (SD)	55.7 (14.7)	
Gender		
Male	81	27.2
Female	217	72.8
Residence		
Urban	246	82.8
Rural	51	17.2
Ethnicity		
Mestizo	253	84.9
White	29	9.7
Indigenous	7	2.3
Montubio	1	0.3
Mulato	5	1.7
Tsachila	1	0.3
Afro-Ecuadorian/Black	2	0.7
Education Level		
Before College	184	61.7
Some College or Above	114	38.3
Employment Status		
Employed	126	42.4
Unemployed	171	57.6
Marital Status		
Single	55	18.5
Separated	5	1.7
Divorced	28	9.4
Widowed	21	7
Married	176	59.1
Civil Union	13	4.4
Current Cancer Diagnosis?		
Yes	254	85.2
No	44	14.8
Type of Cancer		
None	44	15.2
0 Cervical	24	8.3
Breast	80	27.6
Gastrointestinal	28	9.7
Urinary (Prostate)	24	8.3
Leukemia/Lymphoma	20	6.9
Thyroid	19	6.6
Other Type	51	17.6
Previous Psychiatric Evaluation?		
Yes	59	20.0
No/Don't Know	236	80.0

the SSU also had higher levels of depression (Spearman's rho=-0.29, p<0.0001) (**Figure 2**). However, when both the ECR and SSU were included in the same linear regression model, ECR was statistically significantly associated with higher depression levels (Beta=-0.38, p<0.001), while the effect of the SSU social support score was no longer significant (Beta=-0.06, p=0.27) (**Table 3**).

Depression and social undermining: Participants with high levels of social undermining, as measured by the SSU had statistically significantly higher levels of depression (Spearman's rho=0.36, p<0.0001) (**Figure 3**). These results held true after adjusting

Table 2 Depression Scores by Demographic factors (N=298).

	Mean PHQ-9 Score	T statistics	p-value
Gender Female Male	6.97 5.28	2.60	p=0.01*
Ethnicity Mestizo/White All Other	6.36 9.13	1.44	p=0.16
Education Below College Some College or Above	7.35 5.14	3.69	p<0.01*
Employment Unemployed Employed	7.18 5.64	2.46	p=0.01*
Civil Status Married/Civil Union Single/Divorced/Widowed	6.86 5.90	-1.51	p=0.13
Cancer Diagnosis Yes No	6.64 5.75	-0.99	p=0.32
Recent Psychiatric Evaluation Yes No/Don't Know	7.31 6.31	-1.22	p=0.22
Residence Urban Rural	6.38 7.18	-0.93	p=0.35

Statistically Significant at alpha=0.05 level

for possible confounders (**Table 3**). When measures of social support (ECR and SSU support score) were included in the linear regression model, social undermining score remained a statistically significant predictor of higher depression scores (Beta=0.27, p=0.005) (**Table 3**).

Discussion

Our results corroborate the findings of previous phases of this study, and contribute some interesting additional findings. We verified that tablet-based screening is a rapid, efficient and cost-effective method to screen patients for depression. As in previous years, we found elevated depression rates in our study population compared to the general population of Ecuador. PHQ-9 scores and Distress Thermometer scores had a significant and strong correlation, serving as an internal validation of our depression measures. Additionally, we replicated the results that unemployment and low levels of education are correlated with depression. Interestingly, we found that female participants had statistically significantly higher depression scores than male participants in our study, a finding that was not evident in previous phases of this project. However, there was a higher proportion of female participants in this phase than in previous phases, which could have contributed to this result.

We found a strong inverse relationship between social support and depression levels, confirming the results of numerous previous

Table 3 Multiple variable regression of PHQ-9 depression scores on social support and social undermining.

Variables	Model 1 ECR not included		Model 2 ECR included	
	β (SE)	p-value	β (SE)	p-value
Social support (SSU)	-0.11 (0.04)	0.008*	-0.06 (0.05)	0.27
Social undermining (SSU)	0.41 (0.07)	<0.0001*	0.27 (0.09)	0.005*
Intimate partner support (ECR)	-	-	-0.38 (0.07)	<0.0001*
Age	0.02 (0.02)	0.38	0.03 (0.03)	0.25
Gender Female vs. Male	1.50 (0.68)	0.02*	1.87 (0.80)	0.02*
Ethnicity Mestizo/White vs. Other	-0.81 (1.34)	0.54	-0.86 (1.84)	0.64
Education Some College vs. Below College	-1.23 (0.64)	0.05	-0.93 (0.75)	0.21
Employment Employed vs. unemployed	-1.05 (0.64)	0.10	-0.45 (0.78)	0.56
Civil Status Married/Civil Union vs. Single/Divorced/Widowed	1.11 (0.61)	0.06	-0.78 (1.22)	0.52
Cancer Diagnosis Yes vs. No	1.44 (0.84)	0.08	1.44 (0.95)	0.13
Recent Psychiatric Evaluation Yes vs. No/Don't know	1.03 (0.76)	0.17	0.91 (0.97)	0.34
Residence Rural vs. Urban	0.48 (0.78)	0.53	-0.29 (0.91)	0.75

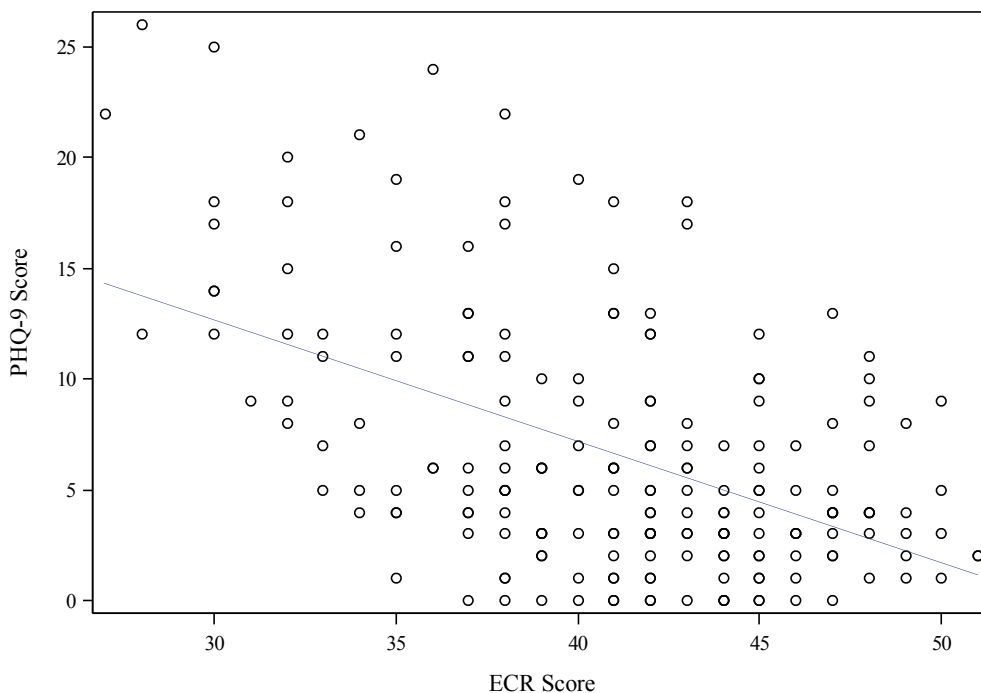*Statistically Significant at alpha=0.05 level.

Figure 1 Correlation of Intimate Partner Support Score and PHQ-9 Depression Score. Low intimate partner support, as assessed by the ECR, correlated with significantly higher depression scores. (Correlation coefficient r=-0.42, p<0.0001).
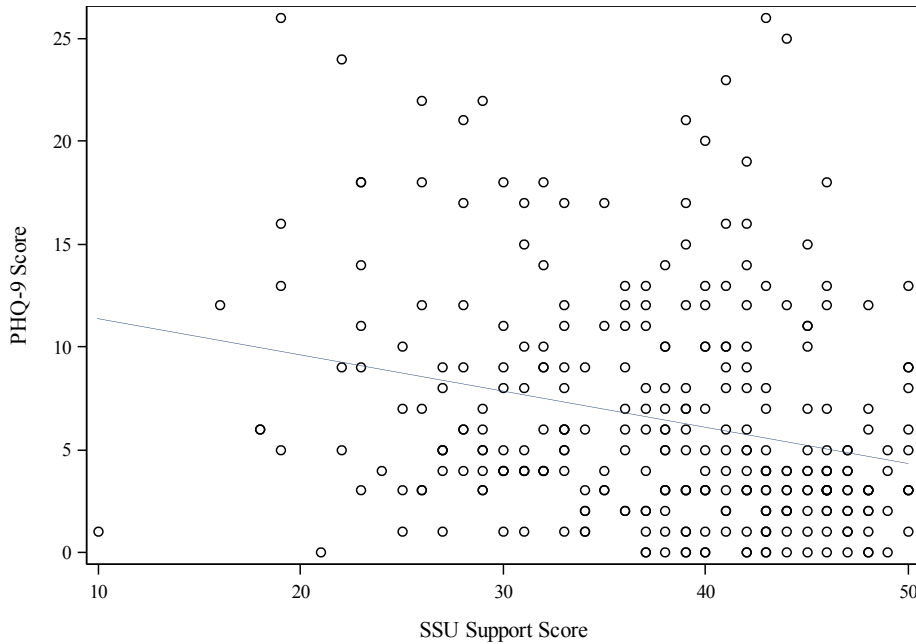
Figure 2 Correlation of Social Support Score and PHQ-9 Depression Score. Low social support, as assessed by the SSU, correlated with significantly higher depression scores. (Correlation coefficient r=-0.29, p<0.0001).
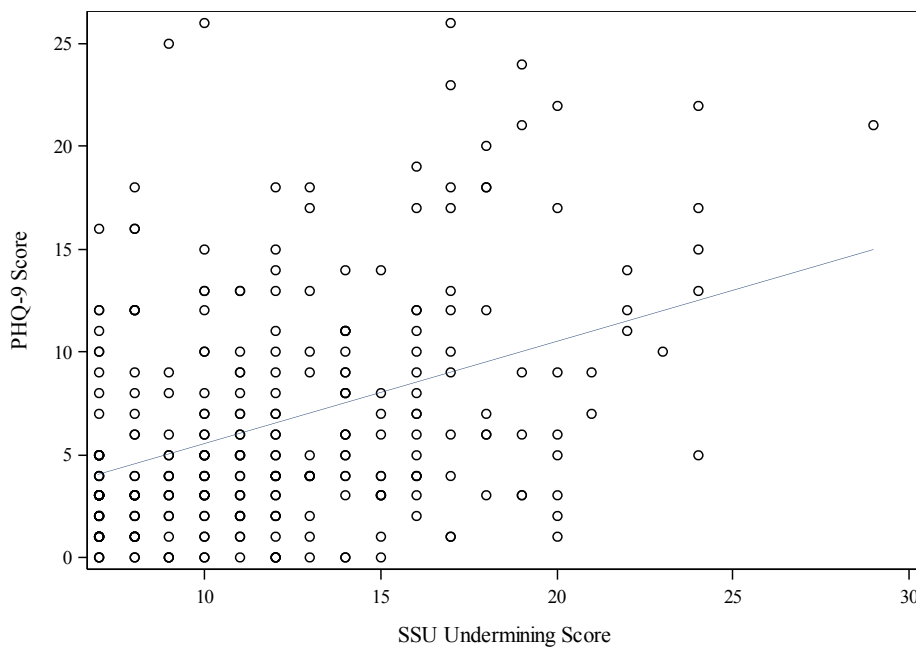

Figure 3 Correlation of Social Undermining Score and PHQ-9 Depression score. High levels of social undermining, as assessed by the SSU, correlated with significantly higher depression scores. (Correlation coefficient r=0.36, p<0.0001).

studies [4,9-11]. By using both the ECR and SSU instruments to assess social support, we were able to uncover which aspects of social support correlated best with depression status. We found that intimate partner support is more important than support from close friends and family in determining depression scores. Because poor social support correlates with increased depression, and depression correlates with increased mortality in cancer patients [5], these findings implicate improvement in intimate partner social support as an extremely important target of psychological therapy in cancer patients.

Our results also show a strong direct correlation between social undermining and depression score. These findings contrast with a previous study of social support and undermining in cancer patients, which found gender-based effects of social support—with wives providing more social support to their husbands than they received in return—and minimal effects of social undermining [24]. Undermining behavior has been associated with unfavorable outcomes in diabetes [25], but there is little research that investigates the triad of physical disease, depression and social undermining. The present study suggests that social undermining is a crucial factor in a cancer patient's depression status. Furthermore, our results indicate that social support and social undermining should be addressed as independent risk factors for depression, as the presence of one may not predict the other.

Conclusion

Our results support our hypothesis that social support and social undermining play a key role in depression levels among cancer patients in Latin America. By using tablet-based instruments to quickly screen for depression and assess social support and social undermining, we were able to uncover which forms of social support best correlate with depression status. We found that intimate partner support is more important than support from close friends and family in determining depression scores.

This suggests that social support—specifically intimate partner support—is an important factor to be addressed in the therapy of depressed patients. We also found that high social undermining correlates with increased depression scores regardless of social support levels, implicating social undermining as major independent risk factor for depression in cancer patients. These results indicate that psychotherapy aiming to uncover and mitigate social undermining is an important addition to traditional therapy in the treatment of depression.

Compliance with Ethical Standards

Ethical Approval: This research was approved by the University of Michigan Medical School Institutional Review Board. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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