The Moderator Rôle of Family Support between Depression and Suicidal Ideation: Discrepancy between Male and Female Military Population in Taiwan

Jen-Hung Huang, M.D.1,2, Yueh-Ming Tai, M.D., Ph.D.1,2*, Szu-Nian Yang, M.D.1,2

1Department of Psychiatry, Tri-Service General Hospital, National Defense Medical Center, Beitou Branch, Taipei, 2Military Suicide Prevention Center, Taipei, Taiwan

Abstract

Objectives: In this study, the authors intended to study the moderator rôle of family support (FS) between depression and suicidal ideation (SI) as well as between the mediation effects of the following three components of the interpersonal theory of suicide – thwarted belongingness, perceived burdensomeness, and capacity for suicide among the military population. Methods: We enrolled 845 military active-duty personnel (male: female = 679: 166) who attended our mental health education series from 2017 to 2018 in Taiwan. The participants were asked to complete self-administrated copies of the Interpersonal Needs Questionnaire, the Acquired Capability for Suicide Scale, the Beck Depression Inventory, the Columbia-Suicide Severity Rating Scale for SI, and the family Adaptation, Partnership, Growth, Affection, and Resolve scale for FS. After comparing baseline characteristics between genders, we did moderated mediation linear analysis, to clarify the moderation effects of FS on the relationship between depression and SI as well as the possible mediation in the relationship. Results: In general, FS plays a protective moderator rôle in the depression ➔ SI (Dep - SI) path (p < 0.05). In male samples, perceived burdensomeness was significantly mediated the effect of depression on SI (p < 0.05). But FS failed to reach a significant level for moderating the medication effect of perceived burdensomeness on the Dep–SI pathway (p > 0.05). On the other hand, in female samples, perceived burdensomeness failed to significantly mediate the effect of depression on suicidal ideation (p > 0.05), but FS significantly and negatively moderated the effect of depression on perceived burdensomeness (p < 0.05). Otherwise, FS showed negative moderation effect for the effect of depression on capacity for suicide in the male samples (p < 0.05) although capacity for suicide failed to become a statistically significant mediator in the Dep–SI path (p > 0.05). Conclusion: In this study, we found that, among military population, a protective moderation effect of FS can reduce the effect of depression on SI and different mechanisms between sexes. We suggest that programs improving FS could be another consideration for military suicidal prevention.

Key words: family support, interpersonal theory of suicide, military suicidal prevention, sex differences

Taiwanese Journal of Psychiatry (Taipei) 2019; 33: 164-169

Introduction

Abundant concern and evidence exist on the depression and suicidality of military service population [1, 2]. Among many proposed theories on suicide, “the interpersonal theory of suicide” was first developed by Thomas Joiner, and is outlined in his book Why People Die by Suicide [3]. The theory consists of three main components to cause suicidality, namely, perceived burdensomeness, thwarted belongingness, and capacity for suicide. It is hypothesized that the combination of perceived burdensomeness and thwarted belongingness would lead to suicidal ideation (SI), and that the augmentation of capacity for suicide could cause suicidal behavior. Studies related to this theory among military population have proven its feasibility and reasonability [4, 5].

Family support (FS) or cohesion has a proven improved effect on loneliness and suicidality in community

Received: May. 27, 2019 revised: Jul. 11, 2019 accepted: Jul. 11, 2019

Access this article online

Quick Response Code: www.e-tjp.org

DOI: 10.4103/TPSY.TPSY_32_19

How to cite this article: Huang JH, Tai YM, Yang SN: The moderator rôle of family support between depression and suicidal ideation: Discrepancy between male and female military population in Taiwan. Taiwan J Psychiatry 2019; 33: 164-9.

*Corresponding author. No. 60, Shin-Ming Road, Beitou District, Taipei 112, Taiwan. E-mail: Yueh-Ming Tai <ytai1123@ms24.hinet.net>
samples [6, 7]. In statistics, moderation and mediation can be hypothesized together in the same model [8]. In that, the “moderated mediation,” as known as “conditional indirect effects,” occurs when the predict variable (X) shows effect on the outcome variable (Y) through a mediator variable (M), but this indirect effect of $X \rightarrow M \rightarrow Y$ can be moderated by a moderator. In other words, the increase of moderator leads to increased (positive) or decreased (negative) change of the indirect effect of $X \rightarrow M \rightarrow Y$ [9]. As shown in Figures 1 and 2, we hypothesized a moderated mediation model with individuals’ depression as the predictor variable, SI as the outcome variable, the three components of this theory as three mediators (Figure 1), and individuals’ FS as the moderator variable (Figure 2). Therefore, we intended to examine how FS and the three components of this theory interact with each other in military population and how we can use this interaction in military suicidal prevention in Taiwan.

**Methods**

This is a cross-sectional survey study. The study protocol was approved by the institutional review board of the Tri-Service General Hospital, National Defense Medical Center in Taipei, Taiwan, with the need of obtaining informed consent from the study participants. The protocol of this study was approved on March 18, 2018 (protocol number 1-107-05-029).

**Study participants**

Our study participants were recruited from local military institutions and troops from 2017 to 2018. After the completion of a half-an-hour introduction and mental health education programs in their troops, we invited attendants to participate in this study. Those participants were asked to complete self-administrated copies of questionnaire according to their current one-week condition.

**Measures**

**Interpersonal theory of suicide**

The interpersonal theory of suicide consists of the following three components that result in suicidality – perceived burdensomeness, thwarted belongingness, and capacity for suicide. In this study, the measurements of perceived burdensomeness and thwarted belongingness were using the Chinese version of Interpersonal Needs Questionnaire consisting of 15 seven-point Likert scales, ranging from 1 as disagree to 7 as totally agree [10]. We also used the Chinese version of Acquired Capability for Suicide Scale to evaluate the third component, CS. The validity and reliability of those 20 five-point Likert scales, from 0 for not agree to 4 for totally agree, have been proven to be feasible for the adolescent and adult population [11].

**Beck Depression Inventory-II**

The Beck Depression Inventory, the second edition (BDI-II), is a 21-item instrument evaluating the existence and severity of depressive symptoms listed in the Diagnostic and Statistical Manual of Mental Disorders-IV. Each item is scored from 0 for “not at all” to 3 for “almost always”[12]. The Chinese version of the BDI-II has been demonstrated to have substantial internal consistency, reliability, and stability in a study of military population in Taiwan [1].

**Columbia-Suicide Severity Rating Scale**

The Chinese version of the Columbia-Suicide Severity Rating Scale (C-SSRS) is designed to evaluate SI and behavior. The C-SSRS in English consists of five self-administered “yes” or “no” items (for 1 or 0) [13]. The higher total score of C-SSRS suggests a higher risk of suicidality with good validity and consistency among adolescents and adults [13]. In this study, we used the C-SSRS total score as the magnitude of SI of our participants.
Family Adaptation, Partnership, Growth, Affection, and Resolve scale

To measure the FS of participants, we used the family Adaptation, Partnership, Growth, Affection, and Resolve (APGAR) scale that is a reliable, validated, utilitarian instrument to measure a patient’s satisfaction with five components of family function. With five three-point Likert scales scoring from 0 to 2, the higher score indicates a higher functional family [14]. The Chinese version of the family APGAR scale has been reported to be a reliable instrument with internal consistency of Cronbach’s alpha of 0.89 and has been used in assessing perceived FS for individuals in a community survey in Taiwan [15].

Statistical analysis

As stated previously, the moderated mediation analysis was first proposed by Baron and Kenny in 1986 [16]. As shown in Figure 1, the association of X to Y, called total effect, can be divided into indirect effects and direct effects. A proposed moderator with a significant interaction with X to Y can be evaluated using the increased or decreased trends of consequential direct or indirect effects of the moderator [9] (Figure 2).

Descriptive analyses were used to present the demographic characteristics of the total sample and different sexes. Then, we compared variables between sexes with independent t-test and Chi-square test for continuous and categorical variables, respectively.

We also used the specific set of “process” macros described by Hayes [9] who programed for the International Business Machine’s Statistical Package for Social Science software (IBM, Armonk, New York, USA) with bootstrapping for the mediation model in Figure 1 and the moderated mediation model in Figure 2. We calculated mediation, indirect, and moderation effects according to the multiple simple mediation models suggested by Preacher and Hayes in 2008 [17].

The analyses in the study were done using the SPSS software version 22 for Windows. The differences between groups and the indirect effects and moderation effects were considered significant if \( p < 0.05 \).

Results

None of the attendants refused to sign the consent form or withdrew from this study. The final samples comprised 845 military active-services personnel (male:female = 679: 166).

Table 1 represents the demographic characteristics of active-duty military personnel recruited in this study. According to the concept diagram of Figure 2 and the moderation mediation analysis model suggested by Preacher and Hayes in 2008 [17], Table 2 summarizes the results of the analysis between the predictor, depression, and the outcome variable, SI, with three mediators, namely perceived burdensomeness, thwarted belongingness, and capacity of suicide, and one moderator – FS. To clarify the moderating impact of FS, measured using the family APGAR scale, Figures 3 and 4 display the direct and indirect mediation effects in the two sex groups and Figures 5 and 6 show the moderation effects of the family APGAR scores in the two sex groups.
Table 2. The results of mediation and moderation analysis between depression and suicidal ideation with three mediators and one moderator

<table>
<thead>
<tr>
<th></th>
<th>Total samples (n = 845)</th>
<th>Male samples (n = 679)</th>
<th>Female samples (n = 166)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total effect (Dep → SI)</strong></td>
<td>0.095 (0.08 - 0.109)*</td>
<td>0.099 (0.083 - 0.115)*</td>
<td>0.068 (0.03 - 0.105)*</td>
</tr>
<tr>
<td><strong>Mediator effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct effect (Dep → SI)</td>
<td>0.07 (0.052 - 0.089)*</td>
<td>0.075 (0.055 - 0.096)*</td>
<td>0.030 (-0.021 - 0.080)</td>
</tr>
<tr>
<td>Indirect effect (total)</td>
<td>0.024 (0.009 - 0.04)*</td>
<td>0.024 (0.007 - 0.04)*</td>
<td>0.038 (-0.007 - 0.096)</td>
</tr>
<tr>
<td>Dep → PB → SI</td>
<td>0.025 (0.01 - 0.041)*</td>
<td>0.023 (0.007 - 0.04)*</td>
<td>0.042 (-0.003 - 0.099)</td>
</tr>
<tr>
<td>Dep → TB → SI</td>
<td>-0.001 (-0.004 - 0.003)</td>
<td>0.001 (-0.003 - 0.006)</td>
<td>-0.003 (-0.012 - 0.001)</td>
</tr>
<tr>
<td>Dep → CS → SI</td>
<td>&lt;0.001 (-0.001 - 0.001)</td>
<td>&lt;0.001 (-0.002 - 0.001)</td>
<td>-0.001 (-0.005 - 0.002)</td>
</tr>
<tr>
<td><strong>Moderator effects of FS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dep → SI</td>
<td>-0.006 (-0.011 - 0)</td>
<td>-0.007 (-0.013 - 0.001)*</td>
<td>0.009 (-0.014 - 0.021)</td>
</tr>
<tr>
<td>Dep → PB</td>
<td>0.003 (-0.011 - 0.016)</td>
<td>0.012 (-0.003 - 0.027)</td>
<td>-0.056 (-0.083 - 0.03)*</td>
</tr>
<tr>
<td>Dep → TB</td>
<td>0.001 (-0.025 - 0.027)</td>
<td>0.007 (-0.02 - 0.035)</td>
<td>-0.030 (-0.104 - 0.045)</td>
</tr>
<tr>
<td>Dep → CS</td>
<td>-0.036 (-0.068 - 0.004)*</td>
<td>-0.044 (-0.077 - 0.01)*</td>
<td>0.004 (-0.086 - 0.094)</td>
</tr>
<tr>
<td>TB → SI</td>
<td>0.006 (-0.001 - 0.013)</td>
<td>0.005 (-0.003 - 0.0012)</td>
<td>0.012 (-0.017 - 0.029)</td>
</tr>
<tr>
<td>PB → SI</td>
<td>-0.001 (-0.003 - 0.004)</td>
<td>0.001 (-0.003 - 0.006)</td>
<td>0.005 (-0.008 - 0.012)</td>
</tr>
<tr>
<td>CS → SI</td>
<td>-0.001 (-0.004 - 0.003)</td>
<td>0.001 (-0.002 - 0.005)</td>
<td>0.004 (-0.011 - 0.003)</td>
</tr>
</tbody>
</table>

*p < 0.05 using t-test. Dep, depression; SI, suicidal ideation; PB, perceived burdensomeness; TB, thwarted belongingness; FS, family support; CI, confidence interval; HR, hazard ratio

Discussion

Our study results (Table 2) demonstrated that the FS had a protective moderation effect between depression and SI (p < 0.05). But among those three components of interpersonal theory of suicide, only the perceived burdensomeness (Table 2) significantly mediated this depression → SI (Dep - SI) path (p < 0.05) in the male samples (Figure 3). None of the three components reached the significant level for being a mediator in female samples (Figure 4). In Figure 5, the FS attenuated the effect of capacity for suicide between depression and suicidal ideation (Dep → CS → SI) by significantly reducing the effect of depression on capacity for suicide (p < 0.05, Table 2). Contrariwise, in the female samples, FS significantly decreased the effect of depression existed on perceived burdensomeness (p < 0.05, Table 2 and Figure 6) although this perceived burdensomeness showed nonsignificant mediation effect on Dep → SI path, probably due to our limited sample size in the female military personnel.

The majority of relevant US military studies have shown that it is the acquired capacity for suicide that dominates individuals’ SI [4, 5] in the US army; our contradictive findings can be due to more restrictive regulation about the availability of armed forces in Taiwanese military environment. In addition, our other interesting findings were that although there was no difference between sex in SI and BDI and C-SSRS scores (Table 1), there were still some significantly higher mean scores of the three components of interpersonal theory...
of suicide and lower FS among our male participants compared with that in female participants.

In general, we found that the effect of depression on SI could be partially mediated by perceived burdensome but not totally (Table 2, direct effect of Dep $\rightarrow$ SI). This finding indicated that the interpersonal theory of suicide can merely partially explain why military personnel think of suicide. And the FS showed different pathways in the moderation effects in sex groups. In other words, male participants with higher FS tended not to acquire capacity for suicide even with depression (Figure 4). In the female participants, the higher FS moderated lower perceived burdensome even with depression (Figure 5). To our knowledge, this is a new discovery for sex discrepancy in this field.

Because a military parenting program developed by the US Army in 2015 showed that improved parenting locus of control is associated with strengthened emotion regulation which predicted reductions in psychological distress and SI [18]. A similar program aimed to improve FS can be another consideration for upgrading military suicide prevention [19] either in male or female active-service members.

**Study limitations**

The readers are cautioned not to overinterpret the study findings because this study has the following two major limitations:

- This study did not randomly choose our samples, and only the personnel who had the opportunity to attend our mental health educational programs were recruited. The absence of this randomized procedure limits us to generalize our results to the whole population.
- Inconsistency between the multiple mediation analysis and the individual simple mediation analyses can happen due to limited sample size or limited magnitude of effects [9]. In this study, although the significant mediation effect of perceived burdensomeness was found in the multiple mediation model (Table 2), individual single mediation analysis of depression to perceived burdensomeness and perceived burdensomeness to SI was nonsignificant. Further study with larger sample size is warranted.

**Study summary**

According to the findings of this cross-sectional survey among military population in Taiwan, the moderation effect of FS on individuals’ SI not only relied on reducing the effect of depression but also on the acquisition of capacity for suicide for the male personnel and on the perceived burdensomeness for the female personnel. Therefore, a manipulation for enhancing FS might be another alternative for military suicidal prevention in Taiwan.

**Acknowledgments**

The opinions expressed are authors’ personal opinions. They are unnecessarily reflecting on those of their hospitals or institutions.

**Financial Support and Sponsorship**

Nil.

**Conflicts of Interest**

The authors declare no conflicts of interest in writing this report.

**References**


