

Psychological Distress and Its Predictors among Subjects Admitted at the China Medical College Hospital for Physical Examination

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Previous studies have found that the prevalence of psychological morbidity was much higher in a population attending a health screening than in a community. Therefore, the main objective of this study was to explore important predictors of psychological distress among subjects admitted for physical examination so that effective strategies to identify subjects with mental distress can be developed. The study sample consisted of 522 consecutive patients admitted to the China Medical College Hospital for health examination program from July 1996 to June 1997. All subjects were given self-administered questionnaires to collect sociodemographic data, goal for check-up, life events, and psychological distress. Only 376 subjects completed all items with an overall completion rate of 72.03%. Taita Symptom Checklist was used to assess the subjects' psychological distress, with an internal consistency at 0.94. Statistical analysis applied in this study were *t*-test, ANOVA with Scheffe pairwise comparison, Spearman correlation coefficient and multiple linear regression. Our results showed that gender and marital status, and age and occupation had significantly interactive effects on psychological distress. Life event and goal for check-up had significantly independent effects on psychological distress. Subjects who had hypochondria, non-specific symptoms, and existing disorders had higher levels of psychological distress than those who had regular check-ups.

Key words

general health screening, psychological distress, sociodemographic factors, check-up goal

INTRODUCTION

Previous studies [1-3] have demonstrated that the presence of psychiatric or psychological morbidity increase significantly the probability of consulting a general practitioner (GP). Therefore, patients may actually seek medical services for underlying psychological problems. Chong [4] found that 38.7% of his subjects attending a health screening program

had psychological morbidity. This prevalence was much higher than that in a community

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population [5]. Chong also indicated that 85% of the psychological morbidity were mild emotional disorders [4]. The Chinese has been described to more often express their emotional problem by reporting somatic symptoms; this is known as, somatisation [6,7]. It is possible that patients may come to health clinics because of some somatic discomforts, which may be mostly related to emotional or psychiatric problems. Some of these patients may need a regular psychiatric help to ameliorate their physical conditions.

Chong's study[4] showed that 56% of his subjects attending health screening clinics had completed at least one similar examination in other health clinic in the preceding year. In some cases, people in Taiwan go to great lengths to get extraordinary health examination just to be reassured with of their health, even if the examinations may not be covered by any medical insurance. This is certainly a special group of people in which characteristics relating to psychological distress might be different from those who had been often surveyed, namely the GP attenders.

Previous studies often focused on patients with minor or trivial physical complaints visiting GPs [8]; much less work has been done, however, on the subjects who come for physical examination. Therefore, we studied this sample to explore the important predictors of psychological distress.

Many literature have suggested that stress, such as major and minor life events is linked to mental health [9-12]. However, others have not found such an association [13-15]. Due to the controversial results of previous researches, our study also examined the effect of life events on the psychological distress of the sample.

An understanding about the underlying grounds of these people utilizing such service may present valuable information in three aspects: (1) to provide effective strategies to identify subjects with mental distress; (2) to adopt psychiatric classifications, specifically designed for use for health examination,

which consider a social axis along with the physical and psychological ones; and (3) to improve the ability of the GPs to investigate and recognize patient's social problems.

MATERIAL AND METHODS

Subjects

The study sample consisted of consecutive patients admitted to the China Medical College Hospital for a one- or two-day health examination program from July 1996 to June 1997. All study subjects were given self-administered questionnaires to their collect sociodemographic data, goal for check-up, life events, and psychological distress. Selection criteria for this study were people who could and would like to complete all items in the self-rating questionnaires. Of the 522 subjects who were eligible for the selection criteria, 376 subjects completed all items with an overall completion rate of 79.03%. The sample subjects' age ranged from 17 to 80 years old with mean of 48.4 and standard deviation of 14.6.

Measurements

Dependent variables

Psychological distress: Psychological distress was assessed by a standardized self-rating symptom checklist, the Taita Symptom Checklist (TSCL), administered on the admission day. This scale was derived from Symptom Check List-90 (SCL-90) [16] and Psychogenic Neurosis Symptom Check List (PNSCL) [17]. This scale consists of 50 items with five points Likert scale, which covers eight primary psychopathological symptom domains: somatisation, obsession, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, and lie scales. The Cronbach's alpha coefficient in this sample was 0.94, which was higher than the criteria for both group and individual comparison [18,19]. One global psychological distress index derived from the eight primary symptom domains was evaluated, namely, the General Severity Index

(GSI), representative of the magnitude of "general psychological distress". Higher GSI scores stood for higher levels of psychological distress. GSI was calculated using the following formula:

$$GSI = \frac{\text{Total Score of TSCL}}{\text{Number of response items}}$$

Independent variables

Sociodemographic variables: These variables included gender, age, marital status (single; married; currently unmarried which included widowed, separated and divorced), employment status (in the labor force; not in the labor force).

Goal factor: The subjective goals for examination, which could be representative of the sum of self-assessment of and attitude to physical health status, were assigned to one of the following five categories:

- (1) Regular routinely scheduled (RS) check-up.
- (2) Irregular routine (IR) check-up, both of which were free from symptoms.
- (3) Hypochondriacal (HP), indicative of marked hypochondriacal worrying or conviction of physical condition.
- (4) Nonspecific symptoms (NS), physical symptoms of unclear nature.
- (5) existing disorder for affirmation (ED).

Life event: This variable was measured by a self-report questionnaire that consisted of 60 items grouped into 10 problem domains covering housing, work, financial status, legal matters, social and leisure activities, family status, child-parent interaction and marital relationship. For each of the 10 domains the presence of social problems was determined and the total score was then computed by adding up the number of domains for which social problems were identified.

Statistical Analysis

Simple descriptive methods of analysis, such as mean, standard deviation, proportion, *t*-test, and Spearman correlation coefficient were employed to analyze data when appropriate. One-way analysis of variance (ANOVA) with Scheffe post hoc test was used to compare

Table 1. Distribution of the sociodemographic factors, life event, goal for check-up and psychological distress variables.

Variable	N (%)
Gender	
Male	233 (54.4)
Female	195 (45.6)
Marital status	
Single	53 (12.4)
Currently married	331 (77.3)
Currently unmarried	44 (10.3)
Age	48.4 ±14.6*
Life event	4.6 ±3.9
Global Severity Index (GSI)	0.7 ±0.4
Employment	
In labor force	305 (71.3)
Not in labor force	123 (28.7)
Goal for check-up	
Regular routinely scheduled	44 (10.3)
Irregular routine check-up	106 (24.8)
Hypochondriacal	57 (13.3)
Nonspecific symptoms	152 (35.5)
Existing disorder for affirmation	69 (16.1)

*mean ±standard deviation.

global group differences of psychological distress and to make pairwise comparison.

To test the contribution or explanatory effects of all the independent variables on GSI by controlling the other independent variables, multiple linear regression was applied. The significant effect of each variable was then determined by *t*-test.

RESULTS

The distributions of demographic factors, life events, and goal for check-up are shown in **Table 1**. Of the 376 subjects, 233 (54.4%) were male. Of these, 285 (75.8%) were married, 52 (13.8%) were single and 39 (10.4%) were currently unmarried. About 70% of the 376 subjects were in the labor force. The percentages of the RS, IR, HP, NS, and ED subjects were 10.3, 24.8, 13.3, 35.5, and 16.1, respectively. Mean age was 48.4 years (SD 14.6) for all subjects in the study. Mean number of life event was 4.6 (SD 3.9). Overall, mean GSI score was 0.7 (SD 0.4).

The effects of all factors on GSI were all

significant except for age (Table 2). The females had significantly higher mean GSI scores than males. Marital status was significantly associated with GSI. Employment status was significantly correlated with GSI, with higher scores for the "not in labor force" subjects. GSI was highest among subjects who reported to affirm the existing disorder (mean=0.81) and then among subjects who had nonspecific symptoms (mean=0.77). RS subjects had the lowest scores of GSI (mean=0.42). The result of Scheffe pairwise comparison indicated that there was no significant difference of mean GSI between RS and IR while the differences between RS and HP, NS, as well as ED reached a significance level of 0.05. A significant association between life event and GSI was found, but no significant association with age was found.

Multiple linear regression was employed to examine the effects of the significant predictive factors on psychological distress that controlled the confounding effects of the other variables among the subjects admitted for physical examination (Table 3). Age and life event were entered in the model as continuous variables. Others such as gender, employment status, marital status, and goal for check-up were included as categorical variables and the reference group for these variables were male, not in labor force, single, and regular routine check-up, respectively. When GSI was regressed on all the variables in the model, about 20% of the variation of GSI was explained. After the main effects had been examined, the interactions of these variables were further evaluated. Two significant interaction terms were found: gender with marital status and age with occupation. These two interaction terms further explained about 4% of the variation in the GSI. The estimated parameters and their standard errors are presented in Table 3. For variables with main effect only, life event was significantly associated with the GSI score. HP, NS, and ED subjects had significantly higher scores of GSI than RS subjects.

Table 2. Correlation of psychological distress among subjects admitted to Chinese Medical College Hospital for physical examination

Variable	GSI	Statistics*
Gender		-2.71 [†]
Male	0.62 ± 0.36	
Female	0.73 ± 0.46	
Marital Status		3.89 [†]
Single	0.75 ± 0.44	
Currently married	0.63 ± 0.40	
Currently unmarried	0.80 ± 0.46	
Employment		2.63 [†]
In labor force	0.63 ± 0.39	
Not in labor force	0.76 ± 0.46	
Goal for check-up		10.58 [§]
Regular routinely scheduled	0.42 ± 0.23	
Irregular routine check-up	0.55 ± 0.33	
Hypochondriacal	0.67 ± 0.37	
Nonspecific symptoms	0.77 ± 0.46	
Existing disorder for affirmation	0.81 ± 0.43	
Age		0.04
Life event		0.27 [§]

* Statistics based on *t*-test for binary variables, analysis of variance for categorical variables with categories more than 2, Spearman correlation coefficients for continuous variables.

[†]*p*<0.05; ^{*}*p*<0.01; [§]*p*<0.001

Table 3. Estimated parameters of sociodemographic factors, life event, and goal for check-up for GSI of TSCL among subjects admitted to China Medical College Hospital.

Variable	GSI		
	EP*(SE*)	<i>t</i> -value	<i>R</i> ²
Intercept	0.20 (0.17)	1.23	24.69%
Age	0.007 (0.003)	2.45 [†]	
Gender			
Female	-0.29 (0.10)	-2.80 [†]	
Employment			
In labor force	0.38 (0.16)	2.36 [†]	
Marital status			
Currently married	-0.25 (0.08)	-2.98 [†]	
Currently unmarried	-0.20 (0.15)	-1.36	
Life event	0.03 (0.01)	6.39 [§]	
Goal for check-up			
Irregular	0.03 (0.07)	0.49	
Hypochondriacal	0.18 (0.08)	2.32 [†]	
Nonspecific symptoms	0.28 (0.07)	4.26 [§]	
Existing disorders	0.30 (0.08)	3.87 [§]	
Gender × Marital			
Female × Currently married	0.41 (0.12)	3.46 [§]	
Female × Currently unmarried	0.44 (0.17)	2.60 [†]	
Age × Employment	-0.008 (0.003)	-2.71 [†]	

*GSI: General Severity Index; TSCL: Taita Symptom Checklist; EP: Estimated Parameter; SE: standard error
[†]*p*<0.05; ^{*}*p*<0.01; [§]*p*<0.001.

Table 4. Values for the estimated coefficient differences for variables with interaction effects

Effect	Among	Coefficient difference	95% CI*
Gender			
Female-Male	Single	-0.29	(-0.49, -0.09)
Female-Male	Married	0.12 (-0.29+0.41)	(0.01, 0.23)
Female-Male	Unmarried	0.15 (-0.29+0.44)	(-0.12, 0.42)
Marital status			
Single-Married	Male	0.25	(0.09, 0.41)
Single-Unmarried	Male	0.20	(-0.09, 0.49)
Married-Unmarried	Male	-0.05 (-0.25+0.20)	(-0.45, 0.35)
Single-Married	Female	-0.16 (-0.41+0.25)	(-0.34, 0.02)
Single-Unmarried	Female	-0.24 (0.20-0.44)	(-0.47, -0.01)
Married-Unmarried	Female	-0.08 (-0.25+0.41+0.20-0.44)	(-0.47, 0.30)
Age (10 years difference)	F*	-0.01 (10×0.007-10×0.01)	(-0.11, 0.09)
Age (10 years difference)	NF*	0.07 (10×0.007)	(0.01, 0.13)
Employment			
F-NF	Age of 25	0.18 (0.38-0.008×25)	(-0.01, 0.36)
F-NF	Age of 45	0.03 (0.38-0.008×45)	(-0.09, 0.13)
F-NF	Age of 65	-0.14 (0.38-0.008×65)	(-0.27, -0.01)

*CI: confidence interval; F: in the labor force; NF: not in the labor force.

For variables with significant interactions, their effects were further analyzed and presented in **Table 4**. The 95% confidence limits without covering zero meant those comparisons reached statistical significance level. Single females had significantly lower GSI scores than single males, while the opposite was observed among married subjects. Gender effect was not statistically significant among unmarried subjects. The effects of marital status among gender groups were significant in two comparisons. One was that single men had higher GSI scores than married men. The other is that single women had lower GSI scores than current unmarried women. Age effect was only significant among subjects not in the labor force, with older subjects having higher GSI scores. The employment effect was only significant among older subjects (over 65 years old). Older subjects who were in the labor force had lower GSI scores than those who were not.

DISCUSSION

Our study used TCSL as a screening instrument to measure the general psy-

chological distress among subjects admitted to the China Medical College Hospital for physical examination. Our study indicated that sociodemographic factors exert their effects interactively on the psychological distress. In particular, gender had a significant influence on psychological distress among single and married subjects. In fact, married women suffered from more psychological distress than married men. On the other hand, single women had less psychological distress than single men. Previous studies of psychological distress in different populations have consistently found that women tended to report higher psychological distress [5,20], but these studies did not examine or detect the joint effects of marital status on the association between gender and psychological distress. This significant gender effect on psychological distress among married subjects reflects the stressful family or housework roles of married women [21].

On the effect of marital status, single men appeared to have somewhat higher levels of psychological distress than married men while single women suffered less psychological distress than current married women. Single

women seemed to have better psychological well-being than married women, but this difference did not reach the significance level of 0.05. Nevertheless, the estimation of this difference is close to statistical significance from the 95% of confidence interval.

The other significant interaction was between age and employment status. Age played an important role on the psychological distress among those not in the labor force. As the subjects get older, they suffered more psychological distress. Employment exerted different effects across different age groups. Among old subjects, occupation presented a protective effect on the psychological well-being, but exerted an adverse effect among younger subjects. Life events showed a significantly adverse effect on the psychological well-being. Finally, the goal for check-up significantly explained the variation of psychological distress.

The possible explanation for the protective effect of occupation among older subjects observed in the study is that these older subjects in the labor force do not work for a living and hence have less stress from work as well as psychological distress. However, we did not examine the types of job they had. Therefore, caution must be taken when generating this result to other population especially when the distribution of job is different from that in our sample.

Previous studies that examined the joint effects of life event and sociodemographic factors on minor psychiatric morbidity had controversial results. Some findings suggested that there is probably no such interactive effect [26,27]. On the other hand, it had been found that age and gender were interactive with different types of social life event [24]. Our results were consistent with the studies of Henderson et al [26] and Meyers et al [27], but not with that of Torgersen [24]. Other findings related to life events was that an association between gender and life event was observed [28], which had not been found in our study. However, our study found that being single

was associated with a higher number of life events.

One potential bias in our study was the differential reporting life event among subjects with different levels of psychological distress due to a different perception of the severity of stress of these life events. Under-reporting by subjects with low psychological distress or over-reporting by subjects with high psychological distress would result in overestimation of the effect of life event. However, our study using multiple regression analysis has found that the percentage of variance explained by life event is about 10%, which is consistent with previous studies [22,23]. In addition, less degree of mental illness was less associated with genetic predisposition [24] and more associated with stress in the social environment [25]. Therefore, even though the possibility of overestimating the effect of life event may exist, the effect of life event on psychological distress should still be substantial.

Most studies related to mental health were about reporting prevalence of different psychiatric conditions. In stead of focusing on the psychiatric classification of symptom-complexes, our aim was to describe associations between psychological distress and its predictors among subjects for physical examination. Most of these variables were related to social conditions except for the goal for check-up, a subjective variable measuring self-assessment of and attitude to physical health status. Nevertheless, the strong relation between goal for check-up and psychological distress should be underlined. Goal for check-up alone explained 10.29% of the variation of the psychological distress. When the other variables were included in the model, the inclusion of goal for check-up explained the additional 8.22% of the variation. When we examined the effect of each category of this variable, the presence of hypochondriacal anxiety increased the psychological distress levels compared to those who had regular check-ups. These distress levels were lower

than those of the non-specific symptom or existing disorder groups. This result was consistent with those reported by Lee et al [29]. The high levels of psychological distress among those who have check-ups for non-specific symptom or existing disorder in our findings confirmed the findings of previous studies that the presence of physical illness was associated with psychological problems [30-32].

There are two important implications of our current study. One is that the significance of interacting effects of bio-psycho-social factors again provides evidence that models with main effects only were not enough to explore the complex interactions between these factors. The other is that the significant predictors of psychological distress found in the current study will provide clues to identify those with psychiatric morbidity for early intervention among subjects admitted for physical examinations.

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健檢民衆之心理及精神健康狀態及與其預估因子相關之研究

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隨著社會快速變遷，心理及精神疾病之盛行率愈來愈高，根據國外研究顯示求醫民衆之精神疾病盛行率較其他人口為高，因此本研究之主要目的為探討何種因子能解釋健檢民衆心理及精神健康狀態之變化，以提供臨床醫師之早期診斷與治療。於1996年7月至1997年6月前來中國醫藥學院健檢之522名民衆將被納為本研究之參與者，每位參與者填寫一份標準化之台大症狀量表(Taita Symptom Checklist [TSCL])、人口因子、生活事件及前來健檢動機及目的之問卷，台大症狀量表為評估心理與精神健康狀態，於本樣本中其內部一致性(Cronbach's alpha coefficient)為0.94，其中共376位完成所有項目，完成率為72.03%。本研究使用 t 檢定、變異數分析及相關係數來檢定各人口因子、生活事件、健檢動機和心理與精神健康狀態之相關，最後以複迴歸方程式來建立心理與精神健康狀態之預估模式。研究結果顯示年齡和工作狀態及性別和婚姻狀態有顯著之交互作用，而生活事件則和心理與精神健康狀態有顯著之獨立效應，隨著生活事件增加，心理與精神健康狀態則愈不佳，健檢動機為因有病後想瞭解其他身體部位之狀況者有最差之心理與精神健康狀態，其次分別為因有病徵為求診斷及怕有病而前來者，定期健檢者有最佳之心理與精神健康狀態，本研究所建立複迴歸預估模式可解釋24.69%前來健檢民衆心理與精神健康狀態之變異。

關鍵詞

健康檢查，心理精神健康狀態，生活事件，健康檢查動機

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