

# Prevalence and Correlates of Depressive Symptoms in Older Taiwanese Immigrants in Canada

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**Background:** There is a lack of research regarding depression in older Taiwanese immigrants in North American countries. This study in Canada therefore examined the prevalence of depressive symptoms among older immigrants from Taiwan, and psychosocial factors as predictors of depressive symptoms reported by older Taiwanese immigrants.

**Methods:** Ninety-eight migrants (aged  $\geq 55$  years) from Taiwan to Canada, who were part of a multi-site study of health and well-being in a total of 2,272 older ethnic Chinese individuals in community dwellings, completed a face-to-face interview and answered questions in an orally administered questionnaire. Depressive symptoms were measured by a Chinese version of the Geriatric Depression Scale.

**Results:** Of the 98 migrants from Taiwan, 21.5% reported at least a mild level of depression. Predictive factors for depressive symptoms were a negative attitude towards aging, poor general physical health, single marital status, barriers in terms of gaining access to health care services, poor financial status, lower level of identification with Chinese health beliefs, and low income.

**Conclusion:** The prevalence of depressive symptoms in older Taiwanese immigrants in Canada was higher than that reported by older adults in the general Canadian population. Thus, implications for the delivery of health care services, and possible strategies to enhance the mental well-being of older Taiwanese immigrants, are discussed.

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**Key Words:** Canadian immigration, depression, elderly, geriatric psychiatry

## Introduction

Depression is a common, chronic, mental health problem in the aging population. In Taiwan, the prevalence of depression among older adults has varied between studies, perhaps because of the different assessment scales used. A study of depressive symptoms in a selected sample of 195 older Taiwanese adults reported that 57% had a 15-item Geriatric Depression Scale (GDS) score of 7 or higher, indicating that most participants were at least moderately depressed.<sup>1</sup> In another non-random sample of 187 elderly persons in a suburban setting in Taiwan, 34.8% scored 11 or higher on a 15-item Chinese version of the GDS.<sup>2</sup> In a study comprising psychiatrists' assessments of a random sample of 1,500 elderly individuals (aged  $\geq 65$  years) from 3 communities in Taiwan, the prevalence

of depressive disorders was high: indeed, the 1-month prevalence of psychiatric disorders was 37.7% (depressive neurosis 15.3%; major depression 5.9%).<sup>3</sup> In addition, a high risk of depressive disorders was found among widows with a low educational level who were living in urban communities, and among those with physical illnesses.<sup>3</sup>

In North America, depression affects about 10–15% of the elderly population,<sup>4,5</sup> which is becoming increasingly diverse because of increased international migration. Indeed, Canada has been receiving large numbers of immigrants, yet little is known about mental-health status in many migrant groups, and particularly about that in ethnic-minority, elderly immigrants. Such a knowledge gap is evident from the lack of understanding, support services, and treatment options provided for ethnic-minority, elder-

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ly individuals by health care systems in several countries.

Chinese individuals comprise the largest ethnic-minority group in Canada and, with a population of over 1 million, such individuals represented over 1-quarter of all visible ethnic-minority groups in Canada in 2001.<sup>6</sup> However, there has been limited research into the mental-health status of this group, and into that of various subgroups, such as older Taiwanese migrants. To date, only a few studies of depression in elderly, ethnic Chinese adults in the US and Canada have been conducted.<sup>7-13</sup> In these studies, a similarly high prevalence of depression was reported (approximately 18–30%), which was consistently greater than that in the general population, although different screening instruments were used, and 2 of the studies did not use a random sample.<sup>8,9</sup>

Most of the few studies of depression in elderly Chinese individuals in North America considered subjects as 1 group and failed to recognize participants' different countries of origin. Thus, there has been no specific study of depression in older Taiwanese immigrants in North America, although some studies have provided a general estimate of the prevalence of depression in ethnic Chinese individuals. This study examined the prevalence and predictors of depression in older Taiwanese immigrants in Canada. Besides examining the impact of some common predictors of depression identified in previous literature, socio-cultural variables pertinent to elderly Taiwanese immigrants were also included: for example, length of residency in Canada; self-rated English competency; and access barriers to appropriate health care services.

## Methods

### *Study population*

Secondary data analysis was used in this study, with data being obtained from a Canadian multi-site study of health and well-being in older ethnic Chinese individuals in Canada. The latter trial (the Health and Well-Being Study) aimed to examine the relationship between culture and health in 2,272 older ethnic Chinese adults (aged 55–101 years) in 7 major Canadian cities: Calgary, Edmonton, Montreal, Toronto, Vancouver, Victoria and Winnipeg; these cities contain more than 89% of the entire Chinese population of Canada.<sup>6</sup>

The study sample for the Health and Well-Being Study was randomly selected from local telephone directories in each of the above cities. First, Chinese surnames in local telephone directories were identified

and used to form the sampling frame. The use of surnames as identification keys for locating Chinese and other Asian participants, though not without problems, has been well researched and established.<sup>14-16</sup> All identified telephone numbers were entered into a data file to form the sampling frame. Then, based on the size of the Chinese-Canadian population in each location, and the estimated proportion aged at least 55 years, a sample of telephone numbers was randomly selected using Statistical Package for the Social Sciences (SPSS) version 11.0 software (SPSS Inc, Chicago, IL, USA). Trained telephone screeners dialed all randomly selected telephone numbers to identify eligible participants, i.e. ethnic Chinese individuals aged 55 years or older. If there was more than 1 eligible subject in a household, only 1 participant was selected, using a roll-of-dice method, to take part in a face-to-face interview. The study was approved by the local ethics committee, and written or oral consent was obtained from all participants before interview.

Data were collected between summer 2001 and spring 2002. A total of 2,272 participants aged 55 years or older were successfully interviewed, thus representing a response rate of 77%. However, the focus of the present paper is analysis of data obtained from 98 Taiwanese immigrants.

### *Study questionnaire*

An orally administered, structured questionnaire was used during the face-to-face interview. The questionnaire was a Chinese version of the GDS<sup>17</sup> that was originally based on the GDS,<sup>18</sup> but then translated, adapted, and validated to better fit the cultural context of elderly Chinese individuals in North America.<sup>17</sup> This Chinese version of the GDS comprised 15 items, including the following: “dropped many of your activities and interests”; “feel that your life is empty”; “often get bored”; “feel downhearted and blue”; “feel pretty worthless the way you are”; and “frequently feel like crying”. A positive score was assigned to participants who indicated positive answers to items representing depressive symptoms. Participants with a total score of 4 or less were considered “normal”; those who scored 5–9 were considered “mildly depressed”; and those who scored 10 or higher were considered “moderately to severely depressed”. A value for Cronbach's  $\alpha$  of 0.85 was obtained for the Chinese GDS after administration to the 98 Taiwanese immigrants.

### *Predictive factors for depression*

In this study, variables analyzed as possible predictive factors for depression were age, gender, religion, marital status, living arrangement, education level,

financial adequacy, income, social support, life satisfaction, physical health, and attitude towards aging (Table 1). However, to better represent the social context of study participants, variables believed to influence the well-being of older immigrants were also examined. The latter variables included self-rated English competency, length of residency in Canada, access barriers to appropriate health care and support services, Chinese health beliefs, Chinese cultural values, and Chinese ethnic identity.

Self-rated English competency was measured by 2 self-reported questions asking participants whether they were able to understand and speak English; the answers available were “very well”, “a little bit”, or “not at all”. A value of 1–3 was assigned to the answer for each question. The total score from both questions (range 2–6) represented the English competency level of participants, with a higher total score representing a higher level of competency. Social support was measured by 5 questions adapted from the Older

Americans Resources and Services (OARS) Social Resource Scale.<sup>19</sup> These questions assessed family structure, patterns of friendship and visiting, availability of a confidant, and availability of a helper should the need arise. Total scores for all questions were combined to form the social support index, which ranged from 5–15, with higher scores representing a higher level of social support (Cronbach’s  $\alpha$ , 0.65). Life satisfaction was measured by asking participants to indicate their overall level of satisfaction along a 5-point scale, with the lowest score indicating “very dissatisfied” and the highest “very satisfied”. Service barriers were measured by asking participants to indicate the barriers they faced in using health services from a list of 21 potential service barriers identified in previous research,<sup>20</sup> and through inputs from service providers in the Chinese community (Cronbach’s  $\alpha$ , 0.90).

The physical health of participants was measured by the following: the number of chronic illnesses reported from a list of 24 common illnesses; questions

**Table 1.** Demographic background of older Taiwanese immigrants in Canada ( $n = 98$ )

Mean age, yr (SD)	67.9 (8.4)	Personal monthly income, %	
Gender, %		< CAD\$500	10.2
Female	42.9	CAD\$500–999	30.6
Male	57.1	CAD\$1,000–1,499	38.8
Religion, %		≥ CAD\$1,500	20.4
Having a religion	65.3	Social support, mean (SD)	11.4 (2.1)
Not having a religion	34.7	(Range, 5–15)	
Marital status, %		Life satisfaction, mean (SD)	4.07 (0.8)
Single	16.3	(Range, 1–5)	
Married	83.7	Service barriers, mean (SD)	4.56 (4.9)
Living arrangement, %		(Range, 0–21)	
Not living alone	93.9	Number of chronic illnesses, mean (SD)	3.66 (3.6)
Living alone	6.1	(Range, 0–24)	
Education, %		Activities of daily living, mean (SD)	0.05 (0.3)
No formal education	4.1	(Range, 0–12)	
Elementary	9.2	Instrumental ADL, mean (SD)	3.24 (4.8)
Secondary	22.4	(Range, 0–24)	
Post-secondary and above	64.3	Physical health (PCS), mean (SD)	51.3 (7.5)
Self-rated English competency, mean (SD)	4.18 (0.4)	(Range, 0–100)	
(Range, 2–6)		Self-perceived health, mean (SD)	2.97 (1.0)
Mean length of residency, yr (SD)	14.6 (11.6)	(Range, 1–5)	
Financial adequacy, %		Attitude towards aging, mean (SD)	3.65 (0.5)
Adequate	73.5	(Range, 1–5)	
Inadequate	26.5	Chinese health beliefs, mean (SD)	2.25 (0.5)
		(Range, 1–3)	
		Chinese cultural values, mean (SD)	3.52 (0.6)
		(Range, 1–5)	
		Chinese ethnic identity, mean (SD)	23.9 (2.7)
		(Range, 10–30)	

ADL = activities of daily living; CAD\$ = Canadian dollars; PCS = Physical Component Summary; SD = standard deviation.

about functional capacity from a list of basic activities of daily living (ADL) and instrumental ADL (IADL), such as bathing/showering, eating/feeding, light household chores, and meal preparation; general physical-health status measured by the Physical Component Summary (PCS) of a Chinese version of the Medical Outcome Study Short Form-36 (SF-36),<sup>21</sup> a well-established, standardized, health-assessment tool that has been widely used in individuals from various cultural backgrounds;<sup>22-25</sup> a question from the SF-36 asking participants to rate their own health status as “poor”, “fair”, “good”, “very good”, or “excellent”. A value for Cronbach’s  $\alpha$  of 0.88 was reported for PCS scores for the Taiwanese immigrants.

Attitude towards aging referred to the extent to which elderly Chinese individuals viewed aging as positive. Although a few measurements, including the Fraboni Scale of Ageism, the Facts on Aging Quiz, the Oberleider Attitude Toward Aging Scale, and the Kogan Attitudes toward Older Persons Scale, were available to measure attitude towards aging,<sup>26-28</sup> the specific cultural values attached to how older Chinese individuals may see themselves was the reasoning for questions related more to the Chinese cultural context. Thus, the research team in the original study constructed a list of 6 statements, with a choice of 5 answers ranging from “strongly disagree” to “strongly agree”. Examples of the statements include the following: “Having a senior at home is a treasure for the family”; “An elderly person is a burden to the family and society”; “Life is all down-slope in older age and there is not much hope”; and “Being old is something to be proud of”. Total scores for these 6 statements were combined (range 1–5), with a higher score indicating a more positive attitude towards aging. A mean score of 3.65 (standard deviation, 0.5; Cronbach’s  $\alpha$ , 0.54) was reported for the elderly Taiwanese immigrants.

A list of 12 statements related to health maintenance practices and the use of traditional Chinese medicine was constructed to measure Chinese health beliefs. For each statement, participants were asked to indicate their level of agreement (“disagree”, “neither disagree nor agree”, or “agree”). Answers were summed and coded to give a score ranging from 1–3, with a higher score indicating a higher level of Chinese health beliefs held by the participant (Cronbach’s  $\alpha$ , 0.84).

A list of 11 statements reflecting values and beliefs in various aspects of Chinese culture was used to assess Chinese cultural values held by the participants, who were asked to indicate their level of agreement with each statement (“strongly disagree”, “disagree”, “neither disagree nor agree”, “agree”, or “strongly

agree”). Answers were summed to give a score ranging from 1–5, with a higher score representing a greater affinity with Chinese cultural values (Cronbach’s  $\alpha$ , 0.82).

Chinese ethnic identity was measured by 10 questions relating to participants’ ties with the Chinese community. Answers were summed to form a Chinese Ethnic Identity Index with a score range from 10–30. A higher score indicated a higher level of identification with Chinese ethnic identity (Cronbach’s  $\alpha$ , 0.59).

### Statistical analyses

Data were analyzed using SPSS version 11.0 (SPSS Inc). Bivariate associations between depressive symptoms and predictors were analyzed using the Mann-Whitney test, Kruskal-Wallis test, and Spearman’s correlation coefficient, depending on the extent to which study variables had been examined. To further examine the contribution of individual predictive factors to variance in GDS scores, when other predictors were controlled for, stepwise multiple regression analysis was used. Because of the skewed distribution of GDS scores, and as scores of 0 were reported, the  $\log(y + 1)$  transformation formula was applied to GDS scores in the regression analysis.

## Results

Demographic data for the study population, and descriptive statistics for predictive factors of depression, are presented in Table 1. A depression score of 3.22 (standard deviation [SD], 3.41) was reported for older Taiwanese migrants in the study. The findings indicated that 21.5% of Taiwanese study participants had at least a mild level of depression: 13.3% of immigrants were mildly depressed, and 8.2% were moderately to severely depressed. This overall prevalence of depression is not significantly different from values reported for older Chinese immigrants who migrated to Canada from other countries of origin ( $\chi^2 = 4.01$ ,  $p = 0.54$ ). Among participants aged 55–64 years, 11.4% were mildly depressed and 8.6% were moderately to severely depressed. Among participants aged 65 years or more, 14.3% were mildly depressed and 7.9% were moderately to severely depressed. No statistically significant differences were reported between these 2 groups ( $\chi^2 = 0.16$ ,  $p = 0.92$ ). However, the prevalence rates appeared to be higher than the rate of 10–15% usually reported for the general elderly population in Canada.<sup>29</sup>

Bivariate associations between the number of depressive symptoms and various predictive factors for

depression are presented in Table 2. The following factors were associated with a greater number of depressive symptoms: female sex; single marital status; a high level of self-rated English competency; poor financial adequacy; low levels of social support and life satisfaction; large numbers of chronic illnesses and service barriers; poor physical health (PCS) and self-perceived health; and a negative attitude towards

**Table 2.** Bivariate associations between the number of depressive symptoms and predictive factors for depression

	GDS score	Test statistic	<i>p</i>
Age		$r_s = -0.12$	0.252
Gender			
Female	4.35	U = 825.50	< 0.05
Male	2.37		
Religion			
Having a religion	2.80	U = 1,016.00	0.588
Not having a religion	3.44		
Marital status			
Single	4.86	U = 453.50	< 0.05
Married	2.90		
Living arrangement			
Not living alone	3.17	U = 258.00	0.788
Living alone	4.00		
Education			
No formal education	7.00	H = 3.48	0.323
Elementary	4.24		
Secondary	3.36		
Post-secondary and above	2.78		
Self-rated English competency		$r_s = 0.25$	< 0.05
Length of residency (yr)		$r_s = -0.12$	0.260
Financial adequacy			
Inadequate	4.59	U = 563.50	< 0.01
Adequate	2.72		
Personal monthly income			
< CAD\$500	3.69	H = 2.76	0.430
CAD\$500–999	3.10		
CAD\$1,000–1,499	3.62		
≥ CAD\$1,500	2.40		
Social support		$r_s = -0.20$	< 0.05
Life satisfaction		$r_s = -0.31$	< 0.01
Service barriers		$r_s = 0.26$	< 0.05
Number of chronic illnesses		$r_s = 0.30$	< 0.01
Activities of daily living		$r_s = -0.04$	0.696
Instrumental ADL		$r_s = 0.10$	0.323
Physical health (PCS)		$r_s = -0.35$	< 0.001
Self-perceived health		$r_s = -0.36$	< 0.001
Attitude towards aging		$r_s = -0.42$	< 0.001
Chinese health beliefs		$r_s = -0.10$	0.332
Chinese cultural values		$r_s = -0.13$	0.192
Chinese ethnic identity		$r_s = -0.04$	0.670

ADL = activities of daily living; CAD\$ = Canadian dollars; H = Kruskal-Wallis test; PCS = Physical Component Summary;  $r_s$  = Spearman's correlation coefficient; SD = standard deviation; U = Mann-Whitney test.

aging. However, after adjustment for other predictive variables, the effects of certain individual predictors changed. Results in Table 3 show that 7 variables were significant predictors of the number of depressive symptoms in older Taiwanese immigrants: a negative attitude towards aging; poor physical health; single marital status; poor financial status; low income; lower levels of identification with Chinese health beliefs; and a large number of service barriers. These 7 predictors explained 51% of the variance in depressive symptoms reported by Taiwanese immigrants. Among all predictive variables entered into the regression equation, attitude towards aging accounted for the largest proportion (19.5%) of variance in depressive symptoms. Physical health explained 13.1% of the variance, marital status 3.7%, self-rated financial adequacy 4.9%, personal monthly income 3.3%, service barriers 3.1%, and Chinese health beliefs 3.4%.

## Discussion

A few limitations of this study should be noted. First, data were obtained from a cross-sectional study, making it impossible to establish a causal link between predictors of depression and the dependent variable. The “predictors” found to be significantly related to depressive symptoms may actually have reflected characteristics of being depressed. Second, although the study sample was randomly selected, the relatively small sample size is a concern if findings are to be generalized to a large population. Third, this study did not include a sample from mainstream older Canadians, making it difficult to compare the prevalence of depression between such a group and Taiwanese immigrants.

Although measurements used in this study differed from those used in similar trials in Taiwan, the prevalence of depression was generally lower than that reported by older people in Taiwan. For example, 22.2% of the elderly group (aged  $\geq 65$  years) in this study reported at least mild depression. This rate is lower than rates reported in community studies in Taiwan (> 30% to > 50%).<sup>1-3</sup> While older Taiwanese immigrants to Canada might originally be healthier than local Taiwanese elderly people, this probably results from the highly selective Canadian immigration policies that allow only the healthiest persons to enter the country.

As this was a cross-sectional study, it is not known whether older Taiwanese immigrants arrived in Canada with better mental health than previously. Nevertheless, the estimated prevalence of depressive symptoms among older Taiwanese immigrants appeared to be higher than prevalence rates reported for older adults in the general Canadian population. Culture shock, adjustment issues, service barriers, and various forms of discrimination, could explain the higher prevalence of depression among elderly immigrants. Another explanation might be a “healthy immigrant effect”, whereby newer immigrants are healthier than their Canadian-born counterparts, but this health advantage decreases over time as immigrants begin to adopt mainstream beliefs, attitudes, and lifestyles.<sup>30-34</sup> Additional research supports this hypothesis for mid-life immigrants (aged 45–54 years),<sup>35</sup> although further research is advocated, in the same study, to compare depressive symptoms in older immigrants versus the general elderly population in Canada. Conversely, from a community health perspective, it is important to address how such differences might be reduced. Findings from the current study suggest a need for

**Table 3.** Predictors of depression – results of stepwise multiple regression analysis

	$\beta$	SE	R <sup>2</sup>	Adjusted R <sup>2</sup>	R <sup>2</sup> change
Attitude towards aging	-0.49*	0.12	0.195	0.187	0.195
PCS (physical health)	-0.04*	0.01	0.326	0.312	0.131
Married (Reference = single)	-0.48†	0.17	0.363	0.343	0.037
Financial adequacy: adequate (Reference = inadequate)	-0.62*	0.16	0.412	0.387	0.049
Personal monthly income: CAD\$1,000–1,499 (Reference < CAD\$500)	0.34†	0.14	0.445	0.415	0.033
Chinese health beliefs	-0.40†	0.14	0.479	0.444	0.034
Service barriers	0.03†	0.01	0.510	0.472	0.031

\* $p < 0.001$ ; † $p < 0.01$ ; ‡ $p < 0.05$ . CAD\$ = Canadian dollars; PCS = Physical Component Summary.

improved mental health services and interventions in older immigrants.

Predictors of depression in the current study indicated similar findings to previous studies. For example, consistent with previous research, results indicated the importance of physical health<sup>7,35</sup> and financial status<sup>1,9</sup> in explaining depressive symptoms, and confirmed the significant impact of marital status on mental health.<sup>36</sup>

In this study, individuals with a more positive attitude towards aging had fewer depressive symptoms. While it is possible that such a positive attitude is actually an indication of being mentally healthy, this finding emphasizes the importance of finding ways to facilitate a positive attitude towards growing old. In Western societies, where the importance and status of older people have often been neglected, strategies to provide additional support to aging subgroups, such as aging immigrants, would be beneficial to the mental health of such subgroups.

The effect of service barriers was significant in predicting the number of depressive symptoms reported by older immigrants. This finding actually demonstrates the various adjustment challenges and related issues, and service-access issues, faced by the study participants. It also echoes the argument that the immigration experience, and disadvantaged socioeconomic status, often result in elderly immigrants being vulnerable to depression and other mental-health problems, as demonstrated in previous studies.<sup>37,38</sup> An implication is for service providers to review their service delivery approaches and strategies to ensure that service barriers and related challenges for immigrants from different cultural backgrounds can be minimized as much as possible.

Poor physical health is a significant predictor of depressive symptoms. In this respect, preventive measures, such as public health education for older Taiwanese immigrants, would be beneficial to the overall well-being of such immigrants. Another difficulty encountered by many older immigrants is limited financial resources and, as is widely known, financial stability is essential to mental health. Older people with low incomes or poor financial adequacy are vulnerable to depression, as shown in this study. Thus, programs and policies should be implemented to ensure financial stability for older immigrants. Such approaches would be likely to save costs associated with depression, since the prevalence of depression would be reduced.

The relationship between being married and the presence of fewer depressive symptoms is consistent with previous research,<sup>36</sup> and indicates that many

married, older immigrants have access to social resources that enhance well-being. It also points to the social support needs of people who are single, including many who are widowed. Support services and social resources to help sustain health and wellness should be directed at such individuals.

Finally, Chinese health beliefs were not related to depressive symptoms in the bivariate analysis. However, after adjustment for other predictive factors, older immigrants with stronger Chinese health beliefs had fewer depressive symptoms. It therefore appears that adherence to traditional health practices and concepts might serve as a health-protective factor in Taiwanese immigrants in Canada. Although there is no evidence that the use of traditional Chinese medicine improves the health of older Taiwanese immigrants, there are implications for health-service providers. When working with older immigrants with different cultural and health beliefs, service providers should consider trying to understand more about how health and health practices are perceived and maintained. To better meet the health needs of older immigrants, health-promotion and health-prevention strategies should build upon the cultural health beliefs and practices of different immigrant populations.

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