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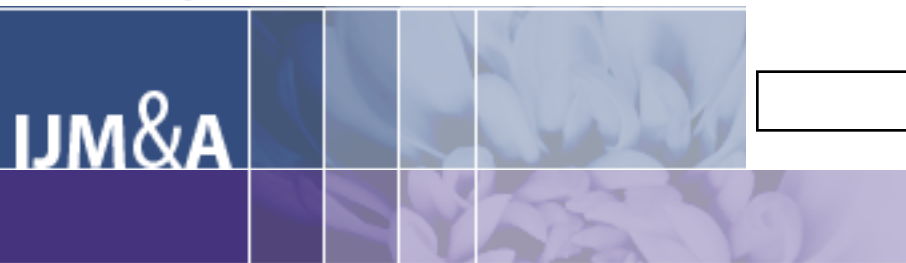
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Gender, Physical Limitation, and Depression Among Elderly Chinese

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Abstract

Research on depression among the elderly generally considers gender as a predicting factor in depression. At the same time, physical limitation often affects the social lives of the elderly, exposing them to a higher risk of depression. Nevertheless, little research has been done to examine the relationship between gender, physical limitation, and depression in the elderly population. This is particularly the case for the elderly from different ethnic minority backgrounds. The research question for this study is: What are the impacts of gender and physical limitation on depression in elderly Chinese-Canadians? Based upon the findings from an earlier study, this paper aims at further examining the effects of gender and physical limitation on depression among a random sample ($N=96$) of elderly Chinese in a Canadian city. Results revealed that there were significant differences in depression levels between elderly Chinese men and women

(10.0% versus 28.6%). However, using hierarchical, logistic multiple regression analyses, the results showed that the impact of gender on depression disappeared when other variables were controlled. On the other hand, physical limitation was the most significant predictor of depression for elderly Chinese participants. These findings speak to the importance of organizing and implementing programs and activities that could mitigate the negative consequences of physical limitation and mobility problems faced by the elderly Chinese.

Keywords: Physical limitation; Depression; Elderly Chinese.

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Several research studies have focused on depression in older adults ([Blazer, 2002](#)). For those living in the community, the prevalence of depression is between 10 and 20 percent. For example, a large-scale epidemiological study reported that 17% of older adults living in the community experienced significant depressive symptoms ([Kennedy, Kelman, Thomas, Wisniewski, & Metz, 1989](#)). In Canada, depression affects approximately 10% of Canadians aged 65 and older ([McEwan, Donnelly, Robertson, & Hertzman, 1991](#)). Despite the findings in the general older population, little is known about depression among visible minority older adults, as research of this particular population is limited.

Research evidence has identified various social factors linked to depression among the elderly population. Demographic variables, such as age and gender, are the two most commonly cited factors associated with depression in later life ([Da Canhota & Piterman, 2001](#); [Hybels, Blazer, & Pieper, 2001](#); [Liu et al., 1997](#); [Lu, Liu, & Yu, 1998](#); [Ptok, Papassotiropoulos, Maier, & Heun, 2001](#)). Other social determinants of depression include early social experiences, recent social stressors, impaired social networks, and poor social integration ([Blazer, 2002](#)).

At the same time, research findings have consistently shown that, among the elderly population, women have a higher prevalence of depression than men (Da Canhota & Piterman, 2001; Hybels et al., 2001; Kennedy et al., 1989; Ptok et al., 2001). In a major Canadian study, more women than men reported to have experienced at least one major depressive episode in a single year—6% of all Canadian women, aged 12 or older, compared with only 3% of men. This pattern was consistent across all age groups (Statistics Canada & The Canadian Institute for Health Information, 2001).

Previous research has also reported that a decline in physical health is often associated with depression among the elderly population (Hybels et al., 2001; Woo et al., 1994; Zhang et al., 1997). Good health and physical functioning are crucial determinants of the subjective well-being among older adults (Girzadas, Counte, Glandon, & Tancredi, 1993; Litwin, 2000). Different varieties of activities, as well as activities that promote freedom of choice, are associated with higher psychological well-being and lower levels of depression among older adults (Depuis & Smale, 1995). In addition, the physical limitations associated with poor health often complicate the impact of health on depression. While physical limitations are strongly associated with depressive symptoms (Cohen, Talavera, & Hartung, 1996; Schulman, Gairola, Kuder, & McCulloch, 2002), they may also jeopardize the social activities of the elderly. Deterioration of physical health might, indeed, decrease the opportunity for older people to engage in various types of activities, which could, in turn, weaken their social networks (Cohen et al., 1996; Litwin, 2000). The resulting decline in socialization often leads to loneliness, social isolation, and low self-esteem—factors that are closely associated with the development of depression (Ellis, 1996).

Despite the fact that both female gender and poor physical health are associated with a greater rate of depression in several studies, there is minimal existing knowledge on the relationship between these two variables in explaining depression. A study analyzing the data from a community sample of 661 older Canadians with chronic illnesses and disabilities in British Columbia indicated that older women experienced more chronic conditions and more difficulty in

performing the activities of daily living. However, the women in this study did not experience a higher level of depression than older men. These findings suggested that the impact of poor health takes precedence over gender in depression among older, frail adults (Shaver & Penning, 2000).

While most of the research findings regarding the elderly population refer to the mainstream Caucasian population, the assumption that research findings obtained from the mainstream population may be generalized to other culturally diverse groups must be challenged. With growing cultural diversity in the aging Canadian society, further research to validate the applicability of these findings to other major ethnic minority groups is needed.

Chinese-Canadians constitute the largest visible minority group in Canada. With a total population of 1,029,400, they represented 26% of the visible minority population in 2001 (Statistics Canada, 2003). Very little research on the overall mental health of this ethnic group is available. The majority of research studies on depression among the elderly Chinese population were conducted in Chinese communities overseas (e.g., Chou, Chi, & Boey, 1999; Da Canhota & Piterman, 2001). However, these studies were not able to provide relevant information regarding depression in elderly Chinese-Canadians who live in a different socio-cultural context. The present study aims to extend our understanding of the relationships among gender, physical limitation, and depression in the elderly Chinese. The main research question is: What are the impacts of gender and physical limitation on depression in elderly Chinese-Canadians?

Methods

Secondary data analysis was used in this study. To analyze the impact of gender and physical health on depression, data from an earlier research study on depression in elderly Chinese people were further analyzed (Lai, 2000). The sample consisted of randomly-selected, elderly Chinese-Canadians who were members of a Chinese senior centre in a mid-sized Canadian city. Telephone interviews were used to collect the data. Out of the 218 elderly Chinese selected, 96 completed the telephone interview, constituting a response rate of 44%. Reasons for non-participation included: eligible respondents being too busy,

not interested, not at home, or unable to be located. The relatively low response rate could be explained by the use of a more conservative calculation for the comparison of completed cases with those who may or may not have been contacted for a response, but were deemed eligible. While a response rate between 40 and 50 percent is often considered reasonable for surveys using this response rate formula (Frey, 1989), the external validity of the findings must be interpreted with caution.

In the original study, a structured questionnaire, consisting of questions pertaining to depression level, basic demographic variables, and health conditions of the respondents, was used for data collection. As the dependent variable, depression of respondents was measured using a Chinese version of the revised Geriatric Depression Scale (GDS) of Mui (1996), which was developed in an earlier study of depression in the elderly Chinese of Manhattan. The scale was translated, adapted and, validated to better fit the cultural context of the elderly Chinese in North America (Mui, 1996). The use of the GDS in telephone interviews has been supported in a previous study (Burke, Roccaforte, Wengel, Conley, & Potter, 1995). The GDS scale consists of 15 items; scores are assigned to respondents who indicate positive answers to items that represent depressive symptoms. Respondents with a total score of four or below are considered free from depression. Those who score between five and nine on the scale are considered mildly depressed, while those scoring 10 or higher are considered moderately to severely depressed. In this study, respondents who scored five and above were grouped into the depressed group while those who scored below five were categorized as the normal group.

Previous research has often demonstrated that poor physical health is a significant predictor of depression. In the present study, physical limitation was the variable used to represent physical health, as it was related to more easily-observable behaviors that respondents could accurately self-report. In the original study, the Chinese version of the Medical Outcome Study 12-item Short Form (SF-12) was used to assess both the physical and the mental health of respondents. The SF-12 scale consists of 12 items from the Chinese SF-36, and has been validated with the elderly Chinese in Boston (Ren, Amick, Zhou, & Gandek, 1998; Ren & Chang, 1998). The Chinese SF-12 consists of the same

items as the original English version, and provides two summary scores that measure the general physical (PCS) and mental (MCS) health of respondents. Higher scores represent better health in each area. In this study, only questions related to physical limitation were included in the analysis. As a consequence, responses from six questions were summed to form an index representing physical limitation. The original scoring of each of the questions, as suggested in the SF-12 users' manual, was reversed so that a higher score would represent a higher level of physical limitation. Since the scoring format used was different in each question, obtained scores were converted to standardized *T*-scores to make score combination more feasible. In this study, the physical limitation scores ranged between -42.8 and 113.8 ($M=.2$), with higher scores indicating more physical limitations. A Cronbach's alpha of .89 was also reported for the six items used to measure physical limitation, indicating a high level of internal consistency in the measurement used.

In addition to the SF-12, respondents were asked to report the illnesses or health concerns they had using a list provided in the survey. However, due to the possible collinearity identified between this variable and the level of physical limitation, these responses were not included in the analysis.

Other independent variables examined in this study were gender, age, marital status, living arrangement, education level, country of origin, length of residency in Canada, and language or dialect spoken. Due to the importance of family support and care in the Chinese community and the demonstrated association between social support and depression (Oxman, Berkman, Kasl, Freeman, & Barrett, 1992; Russell & Cutrona, 1991), a question measuring self-perceived level of family care and support was also included. The elderly Chinese respondents were asked to rate their level of satisfaction with the care and concern provided by their family using a five-point scale (ranging from very dissatisfied to very satisfied). A higher score represented a higher level of satisfaction with regards to the family care received.

Data Analysis

SPSS was used for data analyses. Both bivariate and multivariate analyses were conducted to examine the relationship among depression, the dependent

variable, and various independent variables. The analytical strategy of this study included the following steps: (a) bivariate statistics, including the chi-square test, the *t*-test, and Pearson correlation coefficients, were used to examine the association between depression and the selected independent variables in the study; and (b) logistic regression was used to examine the impact of gender and physical limitation on the likelihood of having depression. A hierarchical logistic model was created wherein variables were entered as different blocks, so as to identify the effects of the selected factors. In the first block, the gender variable was entered. In the second block, other independent variables, including age, marital status, living conditions (alone vs. not alone), education level, ability to speak English, perceived level of family care and support, and length of residency in Canada were added. Finally, physical limitation, as an independent variable, was also entered into the model. The -2 Log likelihood was used to assess how well the resulting model fit the data, with a smaller value indicating a better fit. The significance of the change in the -2 Log likelihood was evaluated when each additional variable block was added to the model.

Results

The Respondents

Among the 96 participants who participated in the study, the majority of them were females (58.3%). Their ages ranged from 65 to 88 years, with a mean age of 71.7 years ($SD=5.0$). Most of them were married (66.7%), while close to one-third (29.2%) were widowed. The remaining participants (4.1%) were either divorced or separated. The majority of participants had obtained primary/elementary education (47.9%), followed by high-school (27.1%), and college- or university- level education (10.4%). Over one-tenth (14.6%) of the participants did not receive any formal education. Most of the participants reported speaking Cantonese (96.9%). Other popular dialects reported included Mandarin (22.9%), Toishan (17.7%), and Vietnamese (12.5%). English was spoken by 16.7% of the participants. Over half (53.1%) of the participants' country of origin before migrating to Canada was Hong Kong, followed by Mainland China (24.0%) and Vietnam (19.8%). The remaining participants had come from other countries (3.1%). On average, the participants lived in Canada for 14.2 years ($SD=8.8$). The most common living arrangement reported was

living with a spouse and children (34.4%), followed by living with children (26.0%), and living with spouse alone (21.9%). Close to one-fifth (17.7%) of the participants reported that they lived alone.

Depression

The GDS scores reported by the participants ranged from 0 to 15, with a mean of 3.1 ($SD=3.6$). Among the participants, 9.4% reported to have symptoms indicating a mild level of depression (indicated by a GDS score between 5 and 9), while 11.5% percent reported a GDS score of 10 or above, indicating a moderate to severe level of depression. For the analyses in this study, these two depressed groups were combined. As a consequence, a total of 20.9% of the participants expressed symptoms of depression.

Table 1 presents the relationship between the depressive symptoms and selected demographic factors. A gender difference in depression was obtained for the participants of this study. First, women reported a higher GDS score than did men (3.9 vs. 2.0; $t=2.8$; $p<.01$). Second, among the women in the study, 28.6% reported being depressed, while only 10.0% of men expressed self-reported depression ($\chi^2=4.9$, $p<.05$).

In an evaluation of the relationship between physical limitation and depression, a Pearson correlation coefficient of .58 ($p<.01$) was obtained, with those participants reporting a higher level of physical limitation having a higher depression score. At the same time, those deemed depressed on the basis of GDS scores (i.e., scoring 5 or higher) reported a significantly higher level of physical limitation than did those who were not depressed (i.e., scoring 4 or below on the GDS) (46.5 vs. -11.9; $t=5.7$; $p<.01$). Among the other independent variables, only length of residency was significantly associated with the GDS score, with a correlation coefficient of .22 ($p<.05$). Again, those who were depressed reported a significantly longer length of residency in Canada than did those who were not depressed (18.7 vs. 13.0; $t=2.6$; $p<.05$).

Results of the logistic regression analysis are presented in **Table 2**. When the gender variable was entered into the regression model, it was a significant predictor of depression in our sample. The likelihood of being depressed among female elderly Chinese was higher than among their male counterparts. Being a

female increased the likelihood of depression by a factor of 3.6. A -2 Log likelihood of 93.01 was obtained for the first logistic regression model ($df=1$, $p<.05$). However, when the second block of variables was entered, gender no longer significantly predicted depression. Among the new variables entered, only length of residency in Canada emerged as a significant variable. The likelihood of being depressed among those who reported a longer length of residency in Canada was higher than among those who reported a shorter stay in Canada. An increase of one year in the length of residency in Canada increased the likelihood of being depressed by a factor of 1.1. The -2 Log likelihood was reduced from by 8.86 to 84.15 ($df=8$, $p=.08$), which constituted a non-significant reduction.

Finally, when physical limitation was added into the model, the -2 Log likelihood was further reduced to 61.5 ($df=9$, $p<.001$), indicating the largest improvement in fit to the data among the three blocks of variables. The resulting model indicated that physical limitation was the only significant predictor of depression. The probability of being depressed increased by a factor of 1.04 for each unit increase in physical limitation. No other variables in the model were significant predictors of depression.

Conclusion

Previous research findings regarding depression and its predictors were based mainly on studies done with the general elderly population. The applicability of such findings to ethnic-minority elderly groups is questionable. The present study aimed to fill the knowledge gap by examining the implications of some common predictors of depression in elderly Chinese-Canadians, the largest visible minority group in Canada. Findings revealed that, although gender differences did exist in terms of depressive symptoms reported by respondents, gender was not a significant predictor when other independent variables were taken into account. On the other hand, physical limitation played a significant role in predicting the prevalence of depression among the elderly Chinese.

The findings of the current study were similar to those of several North American research studies. For example, as reported in previous research (Da Canhota, & Piterman, 2001; Hybels et al., 2001; Kennedy et al., 1989; Ptok et

al., 2001), gender differences in depressive symptoms were found among the elderly Chinese participants in this study. The finding of the negative impact of physical limitation on depression in this study is also comparable with results reported in studies of the general elderly population. In these studies, poor health status is often found to predict a higher level of depressive symptoms (Girzadas et al., 1993; Litwin, 2000). Although Shaver and Penning's (2000) study revealed gender differences in the prevalence of self-reported depression in the elderly Chinese, physical limitation was a major predictor of depression, as was the case in the present study.

The findings obtained have several practical implications. First, preventive interventions should focus on enhancing the physical mobility and capacity of the elderly Chinese. Previous research has demonstrated the negative association between physical mobility and socialization among the elderly population (Litwin, 2000). While many elderly Chinese will experience more illnesses and health conditions due to health deterioration, it is important to provide the type of support that is required to mitigate the negative consequences of physical impairment. Previous research has consistently revealed the benefits of physical activity to the mental health of older adults (Krause, Goldenhar, Liang, & Jay, 1993; Stathi, Fox, & McKenna, 2002).

Services and programs aimed at enhancing the mobility and social functioning of the elderly Chinese can, therefore, be useful in the prevention of depressive symptoms in this ethnic group.

In addition, community education can be employed as another preventive intervention. Educating the older Chinese population and their family members about the relationship between physical mobility and mental well-being could encourage the elderly Chinese to participate in physical activities and programs that would benefit both the physical and the mental aspects of health, thereby enhancing their overall quality of life.

However, the present study has several limitations. First, the sample size was relatively small, which makes the generalizability of the results to the greater elderly Chinese population questionable. Future research studies should include a larger sample from different geographic locations in Canada to enhance the generalizability of the findings. Second, as a secondary data

analysis, the availability of variables for further examination is predetermined according to the original study. This could limit the scope of this study, as only the available variables or predictors were analyzed. Finally, the current study focused only on gender and physical limitation. While the role of physical limitation has been identified in this study, further research is recommended to examine its possible interactions with other predictors, such as social support and poor financial status.

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Table 1. Relationships between depression and demographic variables

		Non-Depressed (GDS: 0 - 4)	Depressed (GDS: 5 - 15)
Gender (%)	Male	90.0	10.0

	Female	71.4	28.6
		($\chi^2 = 4.9, p < .05$)	
<hr/>			
Age (in yrs), mean		71.8	71.4
		($t = .3, p = .737$)	
<hr/>			
Marital status (%)	Married	82.8	17.2
	Single	71.9	28.1
		($\chi^2 = 1.5, p = .214$)	
<hr/>			
Living alone (%)	Yes	70.6	29.4
	No	81.0	19.0
		($\chi^2 = .9, p = .337$)	
<hr/>			
Education (%)	No formal education	71.4	28.6
	Primary	80.4	19.6
	Junior high	72.2	27.8
	Senior high	100	0
	College or university	80.0	20.0
		($\chi^2 = 3.2, p = .527$)	
<hr/>			
Speak English (%)	Yes	87.5	12.5
	No	77.5	22.5
		($\chi^2 = .8, p = .369$)	
<hr/>			
Length of residency (in yrs), mean		13.0	18.7
(Range: 1 to 49)		($t = 2.6, p < .05$)	
<hr/>			
Physical limitation, mean		-11.9	46.5

(Range: -42.84 to
113.77¹)

($t=5.7, p<.001$)

¹ Higher scores representing more physical limitations

Table 2. Results of Hierarchical Logistic Regression Analysis

		Logistic Regression		
		Overall sample		
		Model 1	Model 2	Model 3
		Exp(B)	Exp(B)	Exp(B)
Block 1: Gender	Male			
	Female	3.60 ¹	2.59 ^{ns}	2.06 ^{ns}
Block 2: Age			.94 ^{ns}	.82 ^{ns}
Being married	No			
	Yes		1.31 ^{ns}	1.92 ^{ns}
Living alone	No			
	Yes		1.03 ^{ns}	2.77 ^{ns}
Education	No formal education			
	Primary		.50 ^{ns}	1.07 ^{ns}
	Junior high		1.03 ^{ns}	5.40 ^{ns}
	Senior high		0 ^{ns}	0 ^{ns}
	College or university		2.42 ^{ns}	3.81 ^{ns}
Speaking English	No			
	Yes		.17 ^{ns}	.15 ^{ns}

Length of residency		1.10 ¹	1.06 ^{ns}
Satisfaction with family support		.46 ^{ns}	.60 ^{ns}
Block 3: Physical limitation			1.04 ²
-2 Log likelihood	93.01	78.57	57.61
Change of -2 Log likelihood, df	5.24, 1	14.45, 10	20.96, 1
P value	($p < .05$)	($p = .154$)	($p < .001$)
¹ $p < .05$			
² $p < .001$			
^{ns} not significant			

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