

Risk Factors of Functional Status Decline of Older Persons of Punjab, Pakistan

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Abstract: This paper examines risk factors of functional decline of older persons of Punjab. Data was collected by using multistage cluster sampling and a sample of 4,191 older persons 60+ was drawn. Functional status was measured by taking into account seven indicators, taking bath, changing dress, taking meal, standing from bed/chair, walking around the house, going outside the house and using toilet. Each indicator was measured at two levels i.e. difficulty and no difficulty. Score was ranged from 0 to 7. Respondents with Zero score was considered having no difficulty and with score 1 -7 were considered as having difficulty in their functional status. Various independent factors, residence (urban/rural), age (60-69, 70-79 & 80+), gender (male/ female), education (none, primary, middle, secondary and higher), marital status (never married, married, separated/divorced and widowed), independent source of income(Yes/No), Living Index(high, low), level of depression (low, high) and self-reported health status (no disease, at least one disease) were taken to examine their effect on functional decline. Results of chi square suggested that, residence, age, gender, education, marital status, independent source of income, living index, level of depression and self-reported health status had association with functional decline. Further logistic regression was applied to find out net effect of each independent variable on functional decline of older persons. Results suggested that residence, age, independent source of income, level of depression and self-reported health status affected functional decline. In logistic regression gender, education and living index were not found significantly affecting functional decline of older persons.

Key words: Functional decline • Level of depression • Self- reported health status • Independent source of income • Living index

INTRODUCTION

Aging population is considered both a triumph and challenge of 21st century. With low fertility and mortality and increased life expectancy, in both developed and developing countries, number and percentage of older persons is increasing. Similarly in Pakistan, currently, there are 11 million older persons. Although percentage is low i.e. 6% but number is increasing. This increase in older persons may put a pressure on nation if they are facing disability or have declining functional status. For these reasons frailty and disability of older persons has been an area of interest for many researchers [1, 2]. It has also been observed that focus is now shifting from the concept of aging to active aging [3]. Similarly researchers are concerned with the quality of life [4] because it affects individual's old age process. An important component of quality of life of older persons is their functional independence.

Functional status of individuals is also a sensitive indicator of health or illness of older persons that further determine active aging that enables older persons to be independent and self reliant. Various researches have been done so far on the issue of functional status of older persons and it is argued that some functional decline may be prevented [5-7].

Regarding determinants of functional status researchers argue that prevalence of disability is relatively low in older persons from high socio-economic groups [8-18]. The logic of this argument could be that older persons from relatively privileged groups may have opportunity to enjoy quality of life with sufficient access to basic necessities of life. Therefore they may be able to keep a healthy life that eventually helps them to maintain their functional status.

Similarly it has also been observed that gender is significantly associated with functional status. Current findings regarding gender differences in changes in

functional status are mixed. There is some evidence that men and women are similar in the incidence of disability or rate of functional decline [19-21]. In contrast, some findings have revealed that women experience greater odds of functional impairment [22-24] or a greater rate of functional decline than men [25]. Still others have indicated that men suffer from more accelerated functional decline than women [26, 27].

Functional status has been used to describe ability to perform ADL (activities of daily living) and the ability to perform IADL (instrumental activities of daily living) [8]. Risk factors for incidence of disability or functional status decline can be grouped under demographic, socio-economic and health-related factors. Present study is intended to explain various demographic, economic and health related factors that may affect functional status of older persons in Punjab.

Objective of the Study: Main objective of the study is to find out predictors of functional status of older persons in Punjab.

MATERIALS AND MEHODS

The sampling frame for the 'Multiple Indicator Cluster Survey 2007-08' was developed by the Bureau of Statistics, Government of the Punjab. Rural and urban blocks of all the selected tehsils (sub-districts) were available in this frame. Within a tehsil, cities or towns were divided into enumeration blocks (EBs), which consisted on average of 200-250 households. Villages were divided into rural blocks, which consisted of an average of 250-300 households.

For sampling purposes, the province was divided into three regions: Central, Northern and Southern. A four-stage cluster sampling design was used. At the first stage, about one-third of the districts from each of the three regions (10 in all: two from Northern Punjab, five from Central Punjab and three from Southern Punjab) were selected with probability proportional to size (PPS) of their population. At the second stage, about one-half of the tehsils from each selected district were selected with PPS of their population. At the third stage, urban and rural blocks were selected from each of the selected tehsils. In case of 20 urban blocks or more, two were identified with the PPS of their population; while in case of less than 20 urban blocks; only one was identified based on PPS. For rural areas, almost five percent blocks were identified with PPS of their population. In all, 116 blocks were selected, of which 42 were urban and 74 were rural.

For each selected block, a sampling frame for eligible households was prepared. At the fourth and final stage, 40 eligible households (having at least one member aged 60 and above) for all selected urban and rural blocks were selected randomly. The total sample size came to 4,640.

It was decided before the field survey that one cluster would be covered in one day; and if the interviewer failed to find the respondent from any selected household, then he/she would consider the immediate next eligible household. Of the 4,640 selected households, 4,476 (96.47%) were successfully interviewed. Of these, 285 respondents (6.4%) were found to be aged less than 60. This group was excluded from the final analysis; thus the final sample size came to 4,191.

Measures: The outcome variable of this study functional status was measured by taking into account seven indicators, taking bath, changing dress, taking meal, standing from bed/chair, walking around the house, going outside the house and using toilet. Each indicator was measured at two levels i.e. difficulty and no difficulty. Score was ranged from 0 to 7. Respondents with Zero score was considered having no difficulty and with score 1 -7 were considered as having difficulty in their functional status. Socio-demographic variables consisted of region (north, central and south), residence (urban/rural), age (60-69, 70-79 & 80+), gender (male/female), education (none, primary, middle, secondary and higher), marital status (never married, married, separated/divorced and widowed).

Economic factors included whether respondents had an independent source of income and a computed living index. Living index was a count of eight household items: radio/cassette, television, landline telephone, cellular phone, washing machine, refrigerator/freezer, CD/VCD/DVD player and personal computer. Living index was measured categorically and median 4 was used as a cut point. Respondents with ≤ 4 items were considered as having low living index and respondents with > 4 were considered to have high level.

In regard to health indicators, a composite variable of self-reported ailments was measured by taking five diseases; heart disease, joint pains, fractures, ailments of liver and respiratory disease. An overall health condition was categorized as no disease and at least one disease.

Level of depressive symptoms was measured by using the Center for Epidemiologic Studies Depression Scale (CES-D). The CES-D consists of items that assess negative effect (depressed, sad, lonely) positive effect (happy, enjoy, hopeful), somatic symptoms and retarded activity (poor appetite, restless sleep and interpersonal

difficulty (unfriendly, dislike, couldn't get going, everything an effort). We used a 12-item version of the scale with each item scored never, sometimes, or of ten over the past 2 weeks. Scores ranged from 0 to 24 and a 3-level response format, rather than the standard 4-level format, was devised in light of the low literacy of respondents. Scoring for positively worded items was reversed so that high scores represent higher levels of depressive symptoms. In this study, a scale score of 16 or greater from the total possible score of 24 was used as the measure of depressive symptoms. The score of 16 corresponds to the top quartile in the distribution of scale scores.

RESULTS

Descriptive statistics of all variables used in analysis are given in Table 1. Half the respondents were from the central region of the Punjab. The majority of respondents (65.2%) lived in rural areas and almost half of the respondents were male. More than half (55.1%) were in the age group of 60-69 years. About one third (30.7%) reported ages of 70-79. Only 14.2% were aged 80 or above. Most respondents (72.0%) had no education. Only 11.5% had primary education. Significant majority of respondents (75.3%) had at least one ailment. More than one third (34.1%) of the respondents had an independent source of income. Half of the respondents (50.8%) had high level of living index. More than half had high level of depression.

After examining descriptive statistics for the sample, we developed bivariate Chi square model to examine the association between functional impairment and demographic, economic, physical and emotional health indicators.

Functional status decline was examined by various independent variables and it was found that residence (rural/ urban) does influence functional decline of older persons. Data in Table 2 showed that larger percentage of older persons (54.5%) in rural area reported functional decline compared to 47.8% of respondents in urban area. Similarly percentage of older persons (52.2%) who did not report any difficulty was greater in urban area compared to 45.5% in rural area. Chi square test was also applied and it showed that there is strong association between residence and functional decline of older persons.

Age has been considered as an important determinant of functional status and results of present study supported this assumption. Figures showed that 69.0% of older persons in the age category of 80+ reported functional decline compared to 57.6% and

Table 1: Descriptive Analysis of Independent Variables

Variables	n	%
Region of Punjab		
Southern	1205	28.8
Northern	814	19.4
Central	2172	51.8
Area		
Urban	1459	34.8
Rural	2732	65.2
Gender		
Male	2123	50.7
Female	2068	49.3
Age		
60-69	2310	55.1
70-79	1287	30.7
80+	594	14.2
Education		
No Education	3019	72.0
Primary	481	11.5
Middle	271	6.5
Secondary	265	6.3
Higher	155	3.7
Self Reported Health Status		
No Disease	1036	24.7
At least one Disease	2227	75.3
Level of Depression		
Low	55.9	44.1
High	48.6	51.4
Independent source of income		
Yes	1429	34.1
No	2762	65.9
Living Index		
High	2129	50.8
Low	2062	49.2

44.8% in the age categories of 70-79 and 60-69 respectively. By the same token it was observed that percentages of older persons who reported functional decline was gradually reduced from lower to higher age category. Data suggested that in age category of 60-69 majority of respondent (55.2%) reported no functional decline compared to 42.45 and 31.0% in age category of 70-79 and 60-69 respectively. Results of chi square also supported this association that with increase in age there are more chances of having functional decline.

Various studies have also documented that female are more prone to functional impairment compared to men. Analysis of our research also supports this finding as data in table showed that 58.6% of women reported functional decline compared to 45.9% of males. On the other hand 54.1% male reported no functional decline compared to 41.4% females. Results of statistical analysis also showed significant association between gender and functional decline.

Table 2: Chi Square Test of Functional Status decline by various socio economic determinants

Variables	Functional Decline		P Value
	Yes	No	
Residence			.000
Urban	47.8	52.2	
Rural	54.5	45.5	
Age			.000
60-69	44.8	55.2	
70-79	57.6	42.4	
80+	69.0	31.0	
Gender			.000
Male	45.9	54.1	
Female	58.6	41.4	
Education			.000
No Education	56.6	43.4	
Primary	45.7	54.3	
Middle	40.6	59.4	
Secondary	39.2	60.8	
Higher	27.1	72.9	
Level of depression			.000
Low	42.7	57.3	
High	61.8	38.2	
Living Index			.000
Low	55.9	44.1	
High	48.6	51.4	
Self reported Health Status			.000
No disease	17.8	82.2	
At least one Disease	63.5	36.5	
Independent Source of Income			.000
Yes	39.2	60.8	
No	58.9	41.1	

In regard to educational status and functional impairment of older persons data showed that in the category of higher education significant majority of older persons (72.9%) did not report functional decline compared to only 27.1% who had functional decline. Respondents with no education showed that majority (56.6%) had reported functional decline compared to 43.4% who reported no functional decline.

Respondents' functional decline was also examined by their level of depression. Data in table showed that majority of respondents (61.8%) who had high level of depression, also had functional decline compared to only 38.2% respondents who had high level of depression but had no functional decline. Similarly, majority of respondents 57.3% who had low level of depression also showed no functional decline compared to 42.7% respondents with low level of depression and functional decline. Further chi square test was applied to find any association between these two variables and value of p determined that there was an association between level of depression and functional decline.

Table 3: Logistic Analysis of Functional Status Decline

Variables	OR	95% CI		P-value
		Lower	Upper	
Residence				
Urban	1			
Rural	1.160	1.002	1.344	.047
Age				
60-69	1			
70-79	1.649	1.413	1.926	.000
80+	2.571	2.067	3.197	.000
Gender				
Male	1			
Female	1.133	.964	1.332	.131
Education				
None	1			
Primary	.834	.664	1.048	.119
Middle	.885	.655	1.195	.424
Secondary	1.006	.734	1.378	.969
Higher	.687	.446	1.059	.089
Independent Source of Income				
Yes	1			
No	1.380	1.170	1.628	.000
Level of Depression				
Low	1			
High	1.687	1.461	1.949	.000
Living Index				
High	1			
Low	1.121	.965	1.303	.136
Self reported Health Status				
No Disease	1			
At least one Disease	6.943	5.784	8.334	.000

Socioeconomic status has also been found an important determinant of functional status [28]. Living index and independent source of income as important indicators of socio economic status were taken into consideration and its association with functional decline was assessed in present analysis. In regard to living index results showed that majority of respondents 55.9% with low level of living index had functional decline compared to 44.1% of respondents who had low level of living index but did not have functional decline. Whereas, 51.4% of respondents with high level of living index did not have functional decline compared to 48.6% of respondents with high level of living index and functional decline. Statistical analysis also showed an association between living index and functional decline and supports the finding that with low level of living index respondents had functional decline or vice versa.

With reference to independent source of income it was found that majority of respondents 60.8% with independent source of income did not have functional decline compared to 39.2% of respondents who had

independent source of income but also had functional decline. Similarly respondents with no independent source of income showed that 58.9% had functional decline compared to 41.1% with no functional decline. Statistical analysis also supported association between independent source of income and functional decline.

Health status is also found to be significantly associated with functional status. Our analysis showed that large majority of respondents (82.2%) who no disease had also had no functional decline compared to only 17.8% of respondents who had no disease but had functional decline. Data also indicated that respondents with at least one disease there were 63.5% who also had functional decline compared to only 36.5% who did not have functional decline. Results of Chi square also supported association between self reported health status and functional decline.

After bivariate analysis of functional impairment with several demographic, economic, physical and emotional health indicators we run logistic analysis. Results of logistic analysis showed that respondents in rural area are 1.16 times more likely to have functional decline compared to older persons in urban area. As previous studies suggest that with increase in age there are more chances of functional decline, analysis also showed that older persons are 1.649 and 2.571 times more likely to have functional decline in the age categories of 70-79 and 80+ respectively compared to older persons in the age category of 60-69. Gender and education were not significant in logistic analysis and did not affect functional decline of older persons. Results suggest that older persons who had no independent source of income are 1.38 times more likely to have functional decline. With reference to living index, results of logistic analysis were not significant. In regard to level of depression it was noted that respondents who had high level of depression were 1.687 times more likely to have functional decline. Self reported health status was also significant in logistic analysis and results indicated that older persons with at least one disease were 6.943 times more likely to have functional decline.

DISCUSSIONS

This study examined functional decline of older persons with reference to various demographic, economic physical and emotional health indicators. In bi-variate examination all independent variables were significantly associated with functional decline of older persons.

Results indicated that older persons living in rural area had functional decline compared to urban area. Possible explanation of this finding could be that in rural areas environment might be tough and these older persons had to do a lot of hard work that eventually affected their functional status. With reference to age our findings are consistent with various previous researches that suggest that with increase in age there are more chances of having functional decline [29, 5].

In line with some previous researches which documented that gender does not influence functional decline [20] results of logistic analysis suggested that gender was not significant determinant of functional decline. There are various researches that support the argument that SES is inversely associated with functional decline [8, 9]. Similarly in our analysis independent source of income was significantly associated with functional decline. Independent income can enable people to take care of their basic health needs that are important to maintain healthy life style; eventually leading to betterment of functional status in old age. Our results also suggested that both emotional and physical health status have impact on functional status. Results indicated that older persons who had high level of depression and at least one disease are more likely to have functional decline.

In Pakistan functional status of older persons is an under-researched area. To the best of our knowledge, no comprehensive study seems to have been conducted so far to examine functional decline of older persons. Present study seems to be the first ever of its kind in Pakistan and it provides some useful findings on the determinants of functional decline of older persons. Findings could be used by policy makers to take necessary steps to uplift functional status of older persons which in turn help promote active aging.

ACKNOWLEDGEMENT

This research was funded by the United Nations Population Fund (UNFPA), Islamabad, Pakistan

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