Functional Disability and Its Influencing Factors among Elderly with Chronic Low Back Pain

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Abstract

Background: Functional disability is the most common health problem affecting older adults with chronic low back pain (CLBP) and a major challenge to international health systems. It is associated with impaired ability to carry out the activities of daily livings (ADLs) and instrumental activity of daily livings (IADLs), and a high degree of dependency. **Aim of the study:** To assess functional disability and its influencing factors among elderly with chronic low back pain. **Subjects and method: Research design:** A cross-sectional descriptive design was utilized. **Setting:** The study was conducted at four outpatient clinics at Zagazig University Hospitals. **Subjects:** Simple random sample composed of 135 elderly aged ≥60 years with CLBP. **Tools of data collection:** Three tools were used to collect the study data: **Tool I:** A structured interview questionnaire. **Tool II:** Numeric Pain Rating Scale (NPRS) and **Tool III:** Roland-Morris Disability Questionnaire (RMDQ). Influencing factors were identified by using chi-square and multiple linear regression analysis. **Results:** 73.3% of the studied elderly had severe disability, 20% had moderate, and 6.7% had mild level of functional disability. Statistically significant relations were found between total functional disability and residing in rural areas, married, illiterate, living with spouse, chronic diseases, regular medication use, and CLBP intensity. **Conclusion:** Higher prevalence of functional disability and many influencing factors were identified among the elderly with CLBP. **Recommendation:** Continuous assessment of functional disability of elderly with CLBP, taking into account the influencing factors is important for early intervention. Developing and conducting educational programs for elderly with CLBP to decrease their functional disability.

Keywords
Functional disability, Elderly, Chronic low back pain, Influencing Factors

Introduction

The world population has experienced a demographic change towards a geriatric population over the past century [(1)]. By 2030, the number of people aged 65 and up is expected to double to 72 million, accounting for 20% of the total population of the United States [(2)]. In 2017, the number of elderly people in Egypt reached 6.3 million, representing 6.7% of the total population [(3)]. Aging is a biological, psychological, and social phenomenon that causes functional changes as people become older [(4)]. Low back pain (LBP) is the major cause of years lived with disability around the world, and it creates a significant threat to international health services [(5)].

Globally, the number of people suffering from LBP has grown to epidemic proportions, with a mean point prevalence rate of 11.9 % and a one-month prevalence rate of 23.2 %. According to data from the US Burden of Disease Collaborators, LBP has surpassed all other causes of disability in the United States [(6)]. While most cases of LBP in elders are nonspecific and self-limiting, they are also more likely to experience LBP-related pathologies and/or age-related physiological and psychosocial changes [(7)].

Functional disability is a significant health-related problem among older adults [(8)]. It is described as a limitation in one's ability to conduct everyday tasks that are necessary for one to live independently [(9)]. There are different

levels of disability, ranging from no impairment or disability to total lack of functionality. It may be due to genetic defects, diseases, injuries, or the normal aging process, or by a mixture of these factors [10]. Moreover, one of the main factors linked to chronic low back pain (CLBP) is functional disability, which affects 60% of the elderly. CLBP is associated with a loss of mobility and disability to carry out everyday tasks [11].

The gerontological nurses' (GN) role involves assisting, helping, and caring for elderly with functional disabilities and their families, so that they can have access to education, information, and social resources that will help them to maintain satisfying lives. GN who work with the elderly must use their assessment skills to measure the effect of disabilities on their patients' health and care [12].

Significance of the study:

CLBP is the primary cause of disability in the elderly [13]. Functional disabilities related to CLBP can cause an increase in economic burden due to lost productivity, disease progression, increase death rate, and treatment costs [14]. In which to provide care to elderly people, a comprehensive assessment of their functional status is essential [15]. LBP also limits movement, interferes with normal activity, and leads to long-term pain as well as functional disability [16]. Therefore, assessment of the functional disability among elderly with chronic low back pain is very important in which to improve care outcomes.

Aim of the study:

The current study aimed to assess functional disability and its influencing factors among elderly with chronic low back pain at Zagazig University Hospitals, Egypt.

Research Questions:

1. What is the level of functional disability among the elderly with CLBP?
2. What are the influencing factors of functional disability among the elderly with CLBP?

Subjects and method:

Research design:

A cross-sectional descriptive study design was utilized.

Study setting:

The present study was carried out at four outpatient clinics at Zagazig University Hospitals; (1) Rheumatology and Rehabilitation clinic which located in the ground floor in the outpatient clinics building, (2) Orthopedic clinic which located in the first floor in the outpatient clinics building, (3) Chinese acupressure clinic which located in the third floor in the outpatient clinics building, and (4) Neurology clinic which located in the fifth floor in the outpatient clinics building.

Study subjects:

A simple random sample composed of 135 elderly people aged 60 and up, both sexes, diagnosed with LBP for three months or more, Free from traumatic injuries, back surgery, or neurological disorders such as Parkinson disease and stroke as reported by the elderly patient, and able to communicate.

Sample size calculation:

The sample size was calculated to be 135 elderly using open EPI, confidence level 95% according to the following, the number of admitted elderly with LBP in (Rheumatology and Rehabilitation clinic, Orthopedic clinic, Neurology clinic, and Chinese acupressure clinic) is 250/month and prevalence of severe disability is 25% [17].

Tools of data collection:

Three data collection tools were used in this study.

Tool I: An interview questionnaire which composed of two parts;

Part (1): contained questions about the demographic characteristics of the elderly patients such as their age, gender, marital status, education, and their income.

Part (2): contained questions about presence of chronic diseases, regular medication use, present medical history includes: the number of falls and fear of falling, and daily habits include smoking, caffeine consumption, and regular physical activity.

Tool II: Numeric Pain Rating Scale (NPRS) .

This scale was established by McCaffery & Beebe [18] to measure pain severity; patients reported pain severity on a scale of 0 to 10, with 0 suggesting no pain, while 10 suggesting the most severe pain. A score (1–3) indicated mild pain, (4 – 6) indicated moderate pain, and (7–10) indicated severe pain.

Tool III: Roland-Morris disability questionnaire (RMDQ).

This scale was created by Roland & Morris [19]. RMDQ is more sensitive for patients with mild to moderate disability result of acute, sub-acute and CLBP Davies et al., [20]. The RMDQ involves 24 questions requiring “yes” or “no” answers. The total score is determined by adding up the “yes” answers or the number of items checked by the investigator. Scoring, therefore, ranges from 0 (no disability) to 24 (maximum disability). A score from 0 to 8 suggests mild disability, 9 to 16 suggests moderate disability, and 17 to 24 indicated severe disability Stratford et al., [21].

Content validity& Reliability:

The tools were revised by five professionals in Gerontological nursing, Community health nursing, and community medicine at Zagazig University. The content of the tool was evaluated by the panel for clarity, relevance, understandability, and comprehensiveness. The tool's reliability was determined by testing its internal integrity. In the present study, Cronbach α of RMDQ was 0.92 and NPRS was 0.81.

Fieldwork:

Once the approval to conduct the study was granted, the researchers started to plan a schedule for data collecting. The researchers went to the study site to learn about the workplace, work hours, and observe elderly people who came to the study site with a fixed schedule to gather data.

The researcher used to go to the study site to interview elderly people who met the criteria. The study's goal was explained to each elderly person separately, and then the elderly patient was asked if he want to participate in the study. Every elderly patient answered the research tool questions in private. The interview questionnaire took 20 to 30 minutes to answer. The fieldwork was executed over the period from August 2020 up to the beginning of November 2020; four days per week (Saturday, Sunday, Tuesday, and Wednesday) from 8.00 AM to 1.00 PM.

Pilot study:

A pilot study was carried out on 14 (10%) older patients who came to the study site. The pilot study aimed to determine if the study tools were clear, feasible, and applicable. Since there were no changes to the data collection instruments after carried out the pilot study, hence the pilot study is also included in the studied sample.

Administrative and ethical considerations:

The study has been approved by the Research Ethics Committee at the Faculty of Nursing, Zagazig University. Verbal consent was gained from every elderly patient after the study’s purpose was described clearly.

Statistical analysis:

The statistical analysis of the data was done by using the computer software of Microsoft Excel Program and Statistical Package of Social Sciences program (SPSS 22). Data was presented in the form of frequencies and percentages for the categorical data, and mean and standard deviation for the quantitative data. Chi-square test was utilized for comparisons between the qualitative variables. The independent predictors of the RMDQ scores were assessed by the multiple linear regressions analysis. Additionally, Cronbach alpha

coefficient was calculated to determine the scales' reliability. Statistical significance was considered at p < 0.05.

Results:

Among 135 elderly with CLBP, the mean age was 70.37±5.32 years, 54.1% were females and 85.2% from rural areas. 75.5% of the elderly patients were married, 45.9% were illiterate, and 63% their monthly income was sufficient, and 73.3% were living with their spouse **(Table 1)**.

Referring to the prevalence of functional disability among the studied elderly, **table 2** demonstrated that 73.3% had severe level of functional disability, 20% had moderate, and 6.7% had mild level of functional disability. Lastly, the total functional disability score was 15.32±7.34.

Concerning the health history of the elderly patients, 89.6% of them had chronic diseases. Hypertension (30.6%) and diabetes (13.2%) were the highly presented chronic conditions. 72.6% of the elderly were on regular medications, of which, 52% were taking ≥3 medications per day. Regarding levels scores of pain intensity, 65.9% of the older adults had severe pain, 20.7% had moderate, and 13.3% had mild pain **(Table 3)**.

The current study findings illustrated that there were statistically significant relations between the level of total functional disability among the studied elderly and their demographic characteristics as residence, marital status, and educational level (p= < 0.05). In addition, there was a highly statistically significant relation between the level of total functional disability among the studied elderly and living condition (p= < 0.01). It is evident that the elderly with severe functional disability were married, belonged to rural areas, were illiterate, and living with their spouses **(Table 4)**.

The findings of the current study showed that there were highly statistically significant relations between total functional disability of the studied elderly and having chronic diseases and regular medication use (P= < 0.01). While there was a statistically significant relation between the level of functional disability of the studied elderly and CLBP intensity (P= < 0.05). It is evident that the elderly with severe functional disability had chronic diseases, regular medication use, and severe CLBP intensity **(Table 5)**.

Table 6 revealed that marital status, educational level, living condition, chronic diseases, regular medication use, numbers of falls, and pain intensity were statistically significant independent positive predictors of the elderly's functional disability.

Discussion:

The results of the present study pointed out that the mean elderly functional disability score was 15.32±7.34 which indicates severe disability according to Roland-Morris questionnaire. Nearly three-quarters of the studied elderly had severe functional disability, besides about one-fifth had moderate functional disability and minority had mild functional disability. The higher incidence of functional disability between the studied elderly might be due to that the majority of the studied elderly had chronic diseases and severe pain. Besides, increase health problems with advance age and decrease functional capacity of older people to perform basic tasks that are necessary for everyday living.

Likewise, a study carried out by Stefane et al. [22] in Sao Paulo State demonstrated that the mean disability score in the studied sample according to Roland-Morris questionnaire was 14.4±6.0, which represents severe disability. In another study conducted in Copenhagen by Fisker et al. [23] reported that the mean score of disability among the patients according to RMQ was 14.2±4.9. Similarly, Doualla et al. [24] carried out a study in Sub-Saharan Africa and reported that CLBP patients were severely disabled and the mean score of disability was 12.5±6.

Concerning the relation between residence and functional disability, the present study exposed that severe functional disability was associated with living in rural areas. The explanation for such result is that high percentage of illiteracy, low socioeconomic status, lifestyle habits, and decreased level of knowledge regarding way of disability prevention and healthy lifestyle. Similarly, a study conducted in Ismailia, Egypt by Al-disoki & Yassin [25] found a statistically significant relation between the degree of disability and residence in rural areas. In the same context, Wandera et al. [26] in Uganda found that rural residence was associated with severe risk of disability than urban residence for all older persons.

Pertaining to the relation between educational level and functional disability, the current study indicated that severe functional disability was statistically significantly higher among the elderly who were illiterate. Further, educational level was a statistically significant independent predictor for functional disability according to multiple linear regressions. This result might be attributed to lack of knowledge about the magnitude of problems, decrease awareness about maintaining a healthy lifestyle, decrease financial support, and lack of access to health care services.

These results are in agreement with a cross-sectional analytical study carried out in the northern part of the Brazilian state of Minas Gerais by Aguiar et al. [27] who found that the Functional disability in the instrumental activity of daily livings (IADLs) was severe among elderly persons who were illiterate. This result is comparable to the other studies carried out in Tamilnadu by Sowmiya et al. [28] who explored that the incidence of functional disability was extremely high with illiteracy. Furthermore, low educational level was also significantly associated with functional disability.

Regarding the relation between living condition and functional disability, the present study showed that severe functional disabilities were presented in the elderly who were living with spouses. Moreover, the living condition was a significant independent positive predictor for the functional disability. Explanations for this relation may be due to increase responsibility and duties in the house, increase psychosocial stressors with marriage, in addition to decrease functional capacity and multiple chronic diseases with advance age led to physical, social weakening, resulting in a higher prevalence of disability.

In agreement with this, a longitudinal observational study carried in Japan by Imamura et al. [29] informed that living with a spouse was associated with a potential reduction in functional ability for females, while the association was not statistically significant for males. These results are inconsistent with a cross-sectional inferential study conducted in Ireland by Connolly et al. [30] who found a strong association between living with others (not their spouse) and IADLs disability.

Regarding the relation between chronic diseases and total functional disability, the current study clarified that elderly with chronic disease had severe functional disability. Further, chronic diseases were a statistically significant independent predictor for functional disability. Such results may be explained by the fact that elderly persons have more chances of having chronic diseases with advance age. The increased prevalence of chronic diseases, regular medications use, may lead to a decrease in the quality of life and social isolation resulting in functional disability [31].

In the same context, a study carried in Ireland by Connolly et al. [30] showed that chronic condition was significantly associated with IADLs difficulty. This study also shows that among a variety of factors that contribute to IADLs disability having a chronic condition. Likewise, a study in India conducted by Nagarkar & Kashikar [32] reported that IADLs

disability was associated with factors like had two or more chronic diseases. Moreover, the presence of chronic diseases predisposed participants to be functionally disabled.

The findings of the present study reported that severe functional disability was highly associated with regular medication use. Moreover, regular medication use was a significant independent positive predictor for the functional disability. A possible explanation for this is that more than one-half of the studied elderly took ≥3 medications daily because of the various diseases that arise with advancing age. Even worse, with this rise in taking of multiple drugs, there is a higher risk for undesirable health effects such as drug interactions, severe side effects, non-adherence to prescription, reduced functional state, and risk for disability.

Similarly, a study conducted in Lebanon by Zgheib et al. [33] explored that the medications number was significantly associated with the disability level. Moreover, risk factors associated with disability among older adults, including polypharmacy. Likewise, Wang et al. [34] conducted a study in China that demonstrated that polypharmacy is associated with functional disability in older persons.

Considering CLBP intensity, the present study pointed out that severe pain was highly associated with sever functional disability. Further, the intensity of pain was a highly significant independent positive predictor of functional disability. Such finding may be due to that severe pain prevents mobility, affecting bone, muscle control, and physical decline is among the most serious threats to the independence of elderly people and leads to varying disabilities in performing everyday tasks. This finding is consistent with a study conducted in Brazil by Garbi et al. [35] who concluded that the higher the intensity of pain, the higher the disability level. Furthermore, this study revealed a positive correlation between pain severity and disability.

In the same context, two studies carried in Brazil & Canada by De Lucena et al. [36] & Houde et al. [37] demonstrated a significant correlation between pain severity and degree of disability. Older people with increase pain intensity have a higher degree of functional disability. This study finding is consistent with another study conducted in Romania by Sirbu et al. [38] who found a statistically significant correlation between CLBP intensity and disability. Further, pain intensity was a strong predictor of disability in older adults with CLBP according to multivariate linear regression models. Likewise, a study conducted by Verma & Pal [17] in India explored that there was a strong and moderately fair association between pain and disability. Similarly, Doualla et al. [24] conducted a study in Sub-Saharan Africa reported that increased pain intensity moderately associated with higher score of disability.

Conclusion:

Higher prevalence of functional disability and many influencing factors were identified among the elderly with CLBP. Severe functional disability was more common among older adults who were married, belonged to rural areas, illiterate, and living with their spouses. Also, elderly with CLBP who had chronic diseases, regular medication use, and CLBP intensity experienced severe functional disability contrasted to other elderly. Further, marital status, educational level, living condition, chronic diseases, regular medication use, numbers of falls, and total pain intensity were statistically significant positive predictors of functional disability in the elderly with CLBP.

Recommendations:

In view of the findings of the present study, the following are recommended:

- Continuous assessment and early detection of functional disability among elderly with CLBP.

- Developing and conducting educational programs for elderly with CLBP to decrease their functional disability.
- Teaching appropriate coping strategies for the elderly with severe CLBP and severe functional disability.
- Establishing rehabilitation programs for elderly with severe disability to enhance their independence.

Table (1): Demographic characteristics of the elderly with CLBP (N=135)

Items	Frequency	percent
Age(years)		
60-< 70	85	**63**
70 -< 80	28	**20.7**
≥80	22	**16.3**
Mean± SD	70.37±5.32	
Gender		
Male	62	**45.9**
Female	73	**54.1**
Residence		
Rural	115	**85.2**
Urban	20	**14.8**
Marital status		
Single	4	**3**
Married	102	**75.5**
Divorced	3	**2.2**
Widowed	26	**19.3**
Educational level		
Illiterate	62	**45.9**
Read &write	25	**18.5**
Basic education	24	**17.8**
Secondary education	20	**14.8**
University / Postgraduate education	4	**3**
Working before retirement		
Laborer / farmer	24	**17.8**
Technician	20	**14.8**
Free business	10	**7.4**
Employee	20	**14.8**
Housewife	61	**45.2**
Crowding index		
<1	25	**18.5**
1-<2	64	**47.4**
≥ 2	46	**34.1**
Source of income		
Pension	109	**80.7**
Family	16	**11.9**
still working	14	**10.4**
Property income	36	**26.7**
Living condition		
Alone	9	**6.7**
Spouse	99	**73.3**
Sons	23	**17**
Relatives	4	**3**
Current occupation		
Not working	121	**89.6**
Working	14	**10.4**

Table (2): Levels and total score of functional disability among the studied elderly according to Roland-Morris disability questionnaire [RMDQ](N=135)

Levels of functional disability	frequency	percent
Mild disability	9	6.7
Moderate disability	27	20
Severe disability	99	73.3
Total score of functional disability (Mean± SD)	15.32±7.34	

Table (3): Health history of the elderly with CLBP (N=135)

Items	frequency	percent
chronic diseases		
Yes	121	**89.6**
No	14	**10.4**
Types of chronic diseases (n=121) [@]		
Hypertension	37	**30.6**
Diabetes mellitus	16	**13.2**
Heart diseases	12	**9.9**
Renal diseases	2	**1.7**
Respiratory diseases	7	**5.8**
Neurological diseases	14	**11.6**
Liver diseases	6	**5**
Osteoporosis	4	**3.3**
cancer	6	**5**
GIT diseases	15	**12.4**
Thyroid diseases	2	**1.6**
Arthritis	7	**5.8**
Others [@@]	28	**23.1**
On regular medication		
Yes	98	**72.6**
No	37	**27.4**
No. of medication/day (n=98)		
<3	47	**48**
≥3	51	**52**
Level of pain (CLBP) intensity		
Mild pain	18	**13.33**
Moderate pain	28	**20.74**
Severe pain	89	**65.93**

[@] More than one response.

[@@] Other (Herniated disc, Systemic lupus erythematous & Rheumatoid disease).

Table (4): Relations between demographic characteristics of the elderly with CLBP and their Levels of functional disability (N=135)

Items		Levels of functional disability						P-Value
		Mild (n=9)		Moderate (n=27)		Severe (n=99)		
		N	%	N	%	N	%	
Age (year)	60-<70	4	**44.5**	17	**63**	64	**64.7**	.090
	70-<80	3	**33.3**	2	**7.4**	23	**23.2**	
	≥80	2	**22.2**	8	**29.6**	12	**12.1**	
Gender	Male	3	**33.3**	12	**44.4**	47	**47.5**	.707
	Female	6	**66.7**	15	**55.6**	52	**52.5**	
Residence	Rural	7	**77.8**	19	**70.4**	89	**89.9**	.033*
	Urban	2	**22.2**	8	**29.6**	10	**10.1**	
Marital status	Single	1	**11.1**	0	**0.0**	3	**3**	0.015*
	Married	5	**55.6**	16	**59.3**	81	**81.9**	
	Divorced	0	**0.0**	0	**0.0**	3	**3**	
	Widowed	3	**33.3**	11	**40.7**	12	**12.1**	
Educational level	Illiterate	3	**33.3**	12	**44.5**	47	**47.5**	.028*
	Read &write	2	**22.2**	3	**11.1**	20	**20.2**	
	Basic education	1	**11.1**	8	**29.6**	15	**15.1**	
	Secondary	1	**11.1**	3	**11.1**	16	**16.2**	
	University / Postgraduate	2	**22.2**	1	**3.7**	1	**1**	
Current occupation	Working	2	**22.2**	5	**18.5**	7	**7.1**	.108
	Not working	7	**77.8**	22	**81.5**	92	**92.9**	
Monthly income	Not Sufficient	4	**44.4**	17	**63**	64	**64.6**	.483
	Sufficient	5	**55.6**	8	**29.6**	32	**32.4**	
	Sufficient & save	0	**0.0**	2	**7.4**	3	**3**	
Living condition	Alone	7	**77.8**	2	**7.4**	0	**0.0**	.001**
	Spouse	2	**22.2**	20	**74.1**	77	**77.8**	
	Sons	0	**0.0**	5	**18.5**	18	**18.2**	
	Relatives	0	**0.0**	0	**0.0**	4	**4**	

***significant at p ‹ 0.05. **highly significant at p ‹ 0.01.**

Table (5): Relations between health history of the elderly with CLBP and their Levels of functional disability (N=135)

Items		Levels of functional disability						P-Value
		Mild (n=9)		Moderate (n=27)		Severe (n=99)		
		N	%	N	%	N	%	
Chronic diseases	Yes	0	**0.0**	22	**81.5**	99	**100**	.004**
	No	9	**100**	5	**18.5**	0	**0.0**	
Regular medication Use	Yes	7	**77.8**	16	**59.3**	75	**75.8**	.008**
	No	2	**22.2**	11	**40.7**	24	**24.2**	
CLBP Intensity	Mild pain	2	**22.2**	7	**27.9**	9	**9.1**	.012*
	Moderate pain	0	**0.0**	3	**11.1**	25	**25.3**	
	Severe pain	7	**77.8**	17	**63**	65	**65.6**	
Number of falls	Once	2	**22.2**	16	**59.3**	44	**44.4**	.279
	Twice	1	**11.1**	5	**18.5**	11	**11.1**	
	3 times	3	**33.3**	3	**11.1**	18	**18.2**	
	4times	3	**33.3**	3	**11.1**	26	**26.3**	
Fearing of fall	Yes	7	**77.8**	24	**88.9**	95	**96**	.065
	No	2	**22.2**	3	**11.1**	4	**4**	
Smoking	Yes	2	**22.2**	7	**25.9**	24	**24.2**	.971
	No	7	**77.8**	20	**74.1**	75	**75.8**	
Caffeine consumption	Yes	3	**33.3**	21	**77.8**	66	**66.7**	.050
	No	6	**66.7**	6	**22.2**	33	**33.3**	
Physical activity	Yes	2	**22.2**	3	**11.1**	4	**4**	.065
	No	7	**77.8**	24	**88.9**	95	**96**	

***significant at p ‹ 0.05. **highly significant at p ‹ 0.01.**

Table (6): Best fitting multiple linear regression models for elderly's Functional disability

	Unstandardized Coefficients	standardized Coefficients	T	P. value
	B	B		
Marital status	.154	.213	2.470	.015*
Educational level	.531	.272	1.945	.044*
Living condition	.314	.319	2.301	.002**
Chronic diseases	.025	.019	.200	.042*
Regular medication use	.005	.011	.123	.02*
Number of falls	.100	.137	.960	.039*
Total pain intensity	.195	.204	2.041	.008**

ANOVA

Model	Df.	F	P. value
Regression	8	10.08	.000**

a. Dependent Variable: Functional Disability.

b. Predictors: (constant): **Marital status, Educational level, Living condition, chronic diseases, Regular medication use, Numbers of falls, Total pain intensity.**

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