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Relationship between chronic low back pain and functional ability of community dwelling older adults

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Abstract: **Chronic low back pain in older adults is more impeding and is linked to substandard prognoses. It has been joined with several devastating effects, including decreased physical function and increased disability, likelihood of falls, and mood disturbance. Despite its deleterious influences spread beyond the patients, and inflict severe economic load on caregivers and society, few researches are dedicated for older persons.**

Objective: To examine the relationship between chronic low back pain and functional ability of community dwelling older adults

Methodology: the study followed a descriptive correlational research design. One hundred and ten community residing older adults with chronic low back pain were enrolled from two outpatient clinics of the physical medicine, rheumatology and rehabilitation department. Three tools were used to assemble the data; socio-demographic and clinical data structured interview schedule of community dwelling older adults with chronic low back pain, Visual Analogue Scale, and the Japanese Orthopedic Association Back Pain Evaluation Questionnaire.

Results: the study subjects demonstrated lower functional ability scores across all domains of functional ability, several factors affect chronic low back pain intensity as obesity, number of co-morbidities, smoking, and practice of exercise. Likewise, smoking and the number of co-morbidities affect significantly all domains of functional ability. Moreover, there is a significant relationship between chronic low back pain and functional ability in community dwelling older adults.

Conclusion and recommendations: back pain intensity is strongly associated with functional ability of community dwelling older adults with chronic low back pain. The study findings suggest that, designed educational programs should be tailored for elders to enforce positive health habits to achieve the most favorable level of independence for them.

Keywords: **Chronic low back pain, Disability, Functional ability, gerontological nursing, Independence, Older adults.**

1. INTRODUCTION

Worldwide there has been a major growth in life expectancy due to enhancement of health care delivery system [1]. The United Nations has projected that the overall population of individuals aged 60 or above will triple by the year 2050 [2]. In the same way, the Egyptian population over the latter few decades has experienced a gradual escalation in numbers of older people. This tendency will continue over the following decades. It is estimated that by the year 2026 the proportion of persons aged 60 years or more in Egypt will be increased to 10.9% [3], and this percentage might reach 20.8% in the year 2050 thus exceeding the expected rate of total population [4]. This demographic transition towards an older population, resulting in an increase of eighth and ninth years survivals and associated prevalence of chronic disease-

related disability including musculoskeletal diseases [5]. Studies have specified that the predominance of musculoskeletal pain in elderly individuals displayed percentages from 65 to 85%, with 36 to 70% of them complaining of chronic low back pain (CLBP) [6].

Chronic low back pain is defined as discomfort, tension, or stiffness below the costal margin and above the inferior gluteal folds that lasts for lengthier than 12 weeks [7]. It is regarded as the first disabling disorder universally [8]. The prevalence of CLBP among older adults is not exactly recognized and tremendously variable but is reported to range between 13% and 50% in multiple population-based researches among community dwelling older adults in the last year [9]. In the USA alone, more than 17 million older adults pass through at least one bout of LBP each year [10]. In Brazil, 25% of elders complain of LBP [11]. In Egypt, a higher percentage of older patients who visited the outpatient's clinics suffered from musculoskeletal pain, and CLBP in particular [12,13]. Chronic low back pain is the most common health problem among older adults that leads to a reduction in overall function and independence. Thus, appropriate control of this condition may improve all life scopes of older sufferers [14].

Recent evidence shows that CLBP-associated burden increases from the sixth decade [8]. Chronic low back pain in older adults is more impeding and is linked to substandard prognoses than those of other age groups. It has been joined with several devastating effects, including decreased physical function and increased disability, likelihood of falls, and mood disturbance [15]. A community based research of elderly persons demonstrated that back pain was usually accompanied with suffering in keeping upright position, forcing or dragging a big item, and ambulate for a half mile[16]. Similarly, CLBP in older women has been linked to difficulty to carry out the essential and instrumental chores of everyday livings. Weiner et al [17] found that CLBP was concomitant with lower extremity aches and perceived difficulty in execution of fundamental functions of everyday living. Moreover, the deleterious influences of CLBP spread beyond the patients, and inflict severe economic load on caregivers and society [18].

Compared to younger population, CLBP in older adults is considered a more challenging health problem, leading to significant dependency and disability [15]. As older adults with CLBP confront distinctive age-related vulnerabilities which negatively affect their pain recovery, related dependency and dysfunction, and their perspective and reporting of such pain. These multiple vulnerabilities comprise age related alterations in central pain processing, changes in the structure and function of the musculoskeletal system including vertebrae and spine, coexistence of chronic illnesses, poly pharmacy and possible adverse events, and multiple pain origins [19,20]. In addition to, multiple age-related psychosocial comorbidities (e.g., grief from the loss of partner or networks, economic limitations, depression and loneliness [15]. These aforementioned changes may escalate the devastating effects of CLBP, alter patients' adherence to and selection of CLBP medical and therapeutic interventions, and/or cause contraindications to LBP treatments and poorer prognoses [15,16, 21].

Despite CLBP is the greatest restricting and therapeutically challenging pain situation that hassle older adults, families and societies[14,15], even though, the majority of prior researches in Egypt were focused on those of working age. To our knowledge few researches are dedicated for older persons based on the suggestion that back pain fit individuals of the functioning age. Furthermore, with ever changing society and lifestyle and with more active older people today than previously, it is impressive to bring up-to-date profiles continuously. So an adequate body of research is needed in order to investigate the relation between CLBP intensity in the fast growing aging population and ability to perform every day functions. The data derived from the current research will give direction for the gerontological nurse in instituting self-care interventions and preventive care strategies for low back pain to decrease burden on caregivers and decrease health care expenditures.

2. MATERIALS & METHOD

Aim of the study: To examine the relationship between chronic low back pain and functional ability of community dwelling older adults

Research question: what is the relationship between chronic low back pain and functional ability of community dwelling older adults?

Materials

Design: A descriptive correlational research design was used in this study.

Setting: The existent study was done in the two outpatient clinics of the physical medicine, rheumatology and rehabilitation department at the Main University Hospital, Alexandria, Egypt. The monthly patients' attendance rate in these clinics ranged from 90-100 geriatric patients with chronic low back pain.

Subjects: The study comprised a convenience sample of 110 community residing elderly persons attended the above mentioned setting for examination and aged 60 years and above, complained mainly of LBP (pain between the 12th rib and buttock crease) for at least three months, didn't receive any physical therapy, able to communicate and agreed to participate in the study. Had no recent acute condition producing pain such as back surgery, traumatic back injuries, and fractures. Free from any neurological disorders such as (stroke, dementia, and Parkinson's disease) which may alter the geriatric patients' perception of chronic low back pain related functional limitation.

The number of the study subjects was calculated using the EPI info 0.7 program according to the following statistical parameters; population size 300 over three months, expected frequency =50%, acceptable error=10%, confidence coefficient=99%, the program revealed a minimum sample size of 107 geriatric patients and it was increased to the nearest round figure(110).

Tools: Three tools were adopted to gather the required data

Tool I: Socio-demographic and clinical data structured interview schedule of community residence seniors with chronic low back pain

This tool was established by the researchers based on appraisal of the pertinent literature to get the following information from the study subjects:-

Part 1 "Socio-demographic data of the community dwelling older adults with chronic low back pain (CLBP)" such as age, sex, marital status, educational level, occupation prior-retirement, post retirement occupation if found, the nature of previous and current work.

Part 2 "Clinical and life style data" such as medical diagnosis, treatment regimen, weight, height, smoking, and practicing exercises.

Tool II: Low back pain characteristics interview schedule, it comprised two parts:

Part 1: "chronic LBP self-reported characteristics" This part was settled by the researchers based on analysis of related literature to assemble data related to:

- Type, cause, severity, frequency, and duration of back pain
- Factors aggravating LBP such as walking for long distance, sitting or standing for longer time, lifting heavy objects, and etc.
- LBP self- alleviating practices such as taking analgesics, consulting a physician, or taking a warm shower

Part 2: Visual Analogue Scale (VAS) [22]; which is a horizontal 10 cm line, used to assess pain intensity. Geriatric patients were asked to place a mark indicating where the current pain lies on a line pointed out from 0 to 10, where; the left anchor 0 is no pain, 1-3 represents mild pain, 4-7 represents moderate pain, 8-9 represents severe pain and the right anchor 10 is the worst possible, intractable pain .

Tool III: **The Japanese Orthopedic Association Back Pain Evaluation Questionnaire (JOABPEQ)** [23]

The JOABPEQ is a questionnaire to measure numerous facets of back pain, including perceived disability, quality of life, pain distribution and functional status. In the current research the Arabic form of the Japanese Orthopedic Association Back Pain Evaluation Questionnaire (JOABPEQ) [24] was used to assess the functional abilities of older patients with CLBP. It was preferred since it is simple, easy to administer, and has a validated reliable Arabic version which made it appropriate for our study. It includes 25 questions that display five domains to evaluate persons with low back pain from five different dimensions namely; low back pain, lumbar function, walking ability, social life function, and mental health.

The functional score of every subscale was calculated based on the calculating formulas and ranged from 0 to 100 points, with higher scores postulating a greater functional ability [25]. The five functional subscales are premeditated to be used independently; there is no overall score.

Method

1. The study protocol was approved by the Ethical Research Committee at the Faculty of Nursing-Alexandria University, and the permission of the hospital's administration to execute the research was taken after explanation of the aim of the study, the date and time of data collection.

2. The study tools were arranged either constructed by the researchers (i.e. tool I, and part 1 of tool II) or adopted (i.e. part 2 of tool II, and tool III).

3. The developed tools were observed for content validity by five experts, and the adopted tools were already tested for reliability in previous studies [22,24].

4. A pilot study was implemented on 11 community residing older adults who attended the outpatient clinics (Those elders were not contained in the study subjects) to judge the applicability, clarity and feasibility of the study tools, and to determine also, the estimated time to complete the study tools. Based on pilot study findings' the needed modifications were done.

5. Each older adult with CLBP who fulfilled the inclusion criteria was interviewed individually by the researchers in the waiting area of the outpatient clinics while sitting comfortably, the researchers explained the purpose of the study in order to gain the geriatric patients' cooperation, then the necessary data was collected.

6. The researchers used to attend the selected clinics from 9.00 am to 1 pm every day.

7. Collection of data covered a period of 3 months from the beginning of July to the end of September 2018.

Ethical considerations

An informed consent was obtained from older adults to participate in the study after explanation of the study purpose and its potential benefits. Issues related to privacy/ anonymity and confidentiality of the collected data were maintained.

Limitations of the study

Some difficulties were encountered by the researchers during the process of data collection such as overcrowded and noisy environment as the outpatient clinics serve large number of people of all age groups from rural and urban areas.

Statistical analysis

Statistical analysis was done using SPSS version 20.0. The scale and categorical data were described using mean and standard deviation. Chi-Square test and Fisher Exact test were used alternatively to test the association between two qualitative variables or to detect the difference between two or more proportions. The 0.05 level or below was used as the cutoff value for statistical significance.

Table (I) displays the relationship between community dwelling older adults' socio-demographic characteristics and the level of low back pain intensity. The results indicated that more than one half (55.5%) of the studied older adults were males with no statistical significant differences between sexes in relation to pain intensity. Their age ranged from 60-100 year, with a mean of 65.2±7.4 years with no emerged statistical significant differences in relation to pain intensity across all age groups. Regarding educational level, the table reveals that older adults who completed their high education (49.1%), experienced moderate and severe low back pain than other older adults with different educational levels and the difference is statistically significant (P= 0.05). As for marital status, the higher percentage (60%) of those experienced severe low back pain are widow, and the difference is statistically significant (P=0.018). Another statistically significant relation is detected between working status before retirement and low back pain intensity (P= 0.014).Where, the higher percentage (44.4%) of those experienced severe low back pain are housewives. However, no statistically significant relations are detected between type of previous or current work of the studied older adults and low back pain intensity.

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TABLE (I): RELATIONSHIP BETWEEN COMMUNITY DWELLING OLDER ADULTS' SOCIO-DEMOGRAPHIC CHARACTERISTICS AND LOW BACK PAIN INTENSITY AS MEASURED BY THE (VAS)

Socio-demographic characteristics	Studied older adults(n=110)		low back pain intensity						Test of sig.
	No	%	Mild		Moderate		Severe		
			No	%	No	%	No	%	
Sex									X^2 =1.482 P= 0.204
• Male	61	55.5	17	27.9	27	44.3	17	27.9	
• Female	49	44.5	12	24.5	18	36.7	19	38.8	
Age (Years)									
60-	86	78.2	21	24.4	39	45.3	26	30.2	X^2 = 4.765 P= 0.324
70-	15	13.6	6	40.0	4	26.7	5	33.3	
80+	9	8.2	2	22.2	2	22.2	5	55.6	
Educational level									
Illiterate	26	23.6	12	46.2	6	23.1	8	30.8	FET=11.591 P= 0.05*
Basic education	13	11.8	2	15.4	8	61.5	3	23.1	
Secondary education	17	15.5	4	23.5	8	47.1	5	29.4	
High education	54	49.1	11	38.5	23	90.4	20	71.0	
Marital status									
Married	75	68.2	19	25.3	35	46.7	21	28.0	FET=12.523 P= 0.018*
Widowed	20	18.2	5	25.0	3	15.0	12	60.0	
Divorced	10	9.1	2	20.0	5	50.0	3	30.0	
Single	5	4.5	3	60.0	2	40.0	0	00.0	
Occupation before retirement									
Not working	11	10.002	7	63.6	2	18.2	2	18.2	FET=15.572 P= 0.014*
Housewife	27	4.5	8	29.6	7	25.9	12	44.4	
Employee	48	43.6	11	22.9	20	41.7	17	35.4	
Skilled worker	24	21.8	3	12.5	16	66.7	5	20.8	
Current work									
No	73	66.4	19	26.0	30	41.1	24	32.9	FET= 1.003 P= 0.919
Nature of current work	**n (37)**	**%**							
Need light physical effort	22	59.4	7	31.8	9	40.9	6	27.3	
Need heavy physical effort	15	40.5	3	20.0	6	40.0	6	40.0	

X^2= Chi-square test FET= Fisher exact test * Significant P value ≤0.05

According to table (II) a statistically significant relation is found between older adults' body mass index and low back pain intensity. Around 50% of those older adults with class II (52.9%) and class III (50%) obesity have severe low back pain than other older adults across other categories of body mass index classification. The table also depicts a positive statistical significant relation between practicing exercises and low back pain intensity. The percentage of older adults who have severe low back pain is higher for those who did not practice exercises than others who practice them. Regarding the relation between smoking and low back pain intensity, the table shows a statistical significant relation between smoking and low back pain intensity. 45.5% of smokers have severe low back pain compared to 29.5% of non-smokers. Finally the table discloses a statistical significant relation between the number of health problems associated with low back pain and low back pain intensity (p=0.001). The more diseases the older adults have the worse pain intensity they report. Musculoskeletal disorders were most commonly reported by the studied subjects (54.3%) followed by hypertension, DM and GIT disorders 41.9%, 29.6%, and 23.5% respectively.

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TABLE (II): RELATIONSHIP BETWEEN COMMUNITY DWELLING OLDER ADULTS' HEALTH RELATED CHARACTERISTICS AND LOW BACK PAIN INTENSITY AS MEASURED BY THE (VAS).

Health related characteristics	Studied older adults(n=110)		low back pain intensity						Test of sig.
	No	%	Mild		Moderate		Severe		
			No	%	No	%	No	%	
Health problems other than CLPB									
-No	29	26.4	24	82.8	4	13.8	1	3.4	FET= 67.667 P= 0.001*
-One	30	27.3	1	3.3	21	70.0	8	26.7	
-Two	25	22.7	3	12.0	10	40.0	12	48.0	
-Three or more	26	23.6	1	3.8	10	38.5	15	57.7	
Body mass index									
-Underweight (less than 18kg/m^2)	3	2.7	1	33.3	1	33.3	1	33.3	FET= 17.558 P= 0.001*
-Normal weight (18 to 24.9kg/m^2)	26	23.6	12	46.2	9	34.6	5	19.2	
-Overweight (25to 29.9kg/m^2)	25	22.7	9	36.0	8	32.0	8	32.0	
-Obese I (30 to 34.9kg/m^2)	35	31.8	7	20.0	17	48.6	11	31.4	
-Obese II (35 to 39.9kg/m^2)	17	15.5	0	0.0	8	47.1	9	52.9	
-Obese III / Morbidly obese(40kg/m^2 and more)	4	3.6	0	0.0	2	50.0	2	50.0	
Smoking									
-No	88	80.0	28	31.8	34	38.6	26	29.5	FET=7.784 P= 0.019*
-Yes	22	20.0	1	4.5	11	50.0	10	45.5	
Practicing exercises									
-No	90	81.8	19	21.1	39	43.3	32	35.6	FET= 6.328 P= 0.047*
-Yes	20	18.2	10	50.0	6	30.0	4	20.0	

Table (III) implies chronic onset of LBP since six months or further for more than one half (58.2%) of the study older adults. Carrying heavy objects was the most reported cause of LBP among older adults (38.2 %). However, 33.6% of them did not know the exact cause for their back pain. More than three quarters (78.2%) of older adults reported intermittent LBP. More than one half (60%) of older adults stated that their pain course was static and did not change. 42.7% of older adults reported radiation of pain to the both thighs, leg to heel, and 38.2% reported that their pain is felt only at their lower back. Heaviness and stabbing pain like sensations were the most defined pain sensations by 49.1% and 47.3% of the older adults respectively and increased at night time for 41.8% of them. Prolonged sitting was ranked the main stated pain aggravating factor (70%) and was relieved by bed rest and consumption of over the counter (OTC) analgesics for high percentages (91.8%) and (51.8%) of LBP sufferers respectively.

TABLE (III): DISTRIBUTION OF THE STUDIED COMMUNITY DWELLING OLDER ADULTS ACCORDING TO THEIR CHRONIC LOW BACK PAIN SELF- REPORTED CHARACTERISTICS

Chronic LBP self-reported characteristics	N=110	%
Onset of LBP		
From 3 to less than 6 months	46	41.8
6 months and more	64	58.2
Causes of LBP #		
Carrying heavy objects	42	38.2
Work related cause	27	24.5
Accident or fall	17	15.5
Do not know	37	33.6

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Pain frequency		
Intermittent	86	78.2
Continuous	24	21.8
Course of pain		
Static with no change	66	60.0
Increase gradually	31	28.2
Decrease gradually	13	11.8
Duration of pain/day		
Not known	59	53.6
All the day	24	21.8
One hour	13	11.8
Two hours	11	10.0
Three hours	3	2.7
Pain radiation		
Only in the lower back	42	38.2
Right thigh, leg to heel	15	13.6
Left thigh, leg to heel	6	5.5
Both thighs, leg to heel	47	42.7
Pain quality#		
Heaviness	54	49.1
Stabbing	52	47.3
Throbbing	36	32.7
Burning	30	27.3
Numbness	31	28.2
Pain peak time during day		
Waking up time	20	18.2
Daytime	23	20.9
Night-time	46	41.8
The whole day	21	19.1
Factors aggravating CLBP #		
Prolonged sitting	77	70.0
After performance of strenuous physical activity	61	55.5
Lifting heavy objects	53	48.2
Walking for long distance	50	45.5
Prolonged Standing	47	42.7
Climbing up/down stairs	35	31.8
Improper use of back	35	31.8
Straining from constipation and cough	15	13.7
Pushing or pulling heavy objects	12	10.9
Cold climate	10	9.1

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CLBP self-alleviating factors #		
Bed rest	101	91.8
Taking (OTC)* analgesics	57	51.8
Taking the prescribed medication	52	47.3
Use of complementary/ alternative therapy	40	36.4
Taking a warm shower/ applying warm compresses	32	29.1

 # Multiple responses were given

OTC* means over the counter

Table (IV) distributes the studied community dwelling older adults with chronic low back pain according to their functional ability level across the JOABPEQ five life function subscales. It was observed that, the studied older adults demonstrated lower functional ability scores across all domains of the JOABPEQ. According to JOABPEQ, a higher score means better functional ability. The lowest functional ability score was given in the low back pain subscale (24.4±24.1) while the highest level (45.8±21.8) was for mental functions.

TABLE (IV): THE MEAN, STANDARD DEVIATION AND MEDIAN OF COMMUNITY DWELLING OLDER ADULTS' FUNCTIONAL ABILITY LEVEL ACCORDING TO JOABPEQ SUBSCALES

JOABPEQ life function subscales	Mean ±SD	Median
1- Low back pain	24.4±24.1	14.2
2- Lumber functions	40.4±31.7	29.1
3- Walking ability	39.8±33.3	32.1
4- Social functions	37.7±28.5	33.7
5- Mental functions	45.8±21.8	45.6

Table (V) illustrates the relationship between older adults' low back pain intensity and JOABPEQ subscales. The table reveals a statistically significant relation between low back pain intensity and all JOABPEQ subscales (P= 0.001) of older adults. Furthermore, older adults with mild low back pain had higher mean scores across all subscales of the JOABPEQ than those with moderate or severe back pain which means that they have a higher functional ability status. On the other hand the table revealed that more than two third (40.9%) of the studied subjects reported moderate back pain.

TABLE (V): FREQUENCY DISTRIBUTION AND RELATIONSHIP BETWEEN COMMUNITY DWELLING OLDER ADULTS' CHRONIC LOW BACK PAIN INTENSITY AS MEASURED BY THE (VAS) AND THEIR FUNCTIONAL ABILITIES ACCORDING TO JOABPEQ SUBSCALES.

Low back pain intensity	Studied older adults (N=110)		JOABPEQ subscales				
			Low back pain	Lumbar function	Walking ability	Social life function	Mental health
			Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
	No	%					
Mild	29	26.4	49.7±23.1	76.7±20.3	78.0±27.5	70.9±20.0	69.8±14.1
Moderate	45	40.9	13.0±16.0	38.3±25.3	37.1±23.6	36.5±20.5	43.4±15.3
Severe	36	32.7	18.2±18.2	13.8±13.2	12.3±12.5	12.6±10.6	29.3±16.3
Test of significance			F=36.388(0.001)*	F= 74.248(0.001)*	F= 73.123(0.001)*	F= 86.555(0.001)*	F= 56.303(0.001)*

* Significant at p value ≤0.05

Table (VI) reveals no statistical significant relations between older adults' socio-demographic characteristics and all domains of the JOABPEQ except the low back pain subscale and older adults' occupation before retirement (P= 0.004). As shown in the table, skilled workers have the highest disability level related to low back pain.

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TABLE (VI): RELATIONSHIP BETWEEN COMMUNITY DWELLING OLDER ADULTS' SOCIO-DEMOGRAPHIC CHARACTERISTICS AND THEIR FUNCTIONAL ABILITIES ACCORDING TO JOABPEQ SUBSCALES

Sociodemographic characteristics	JOABPEQ subscales				
	Low back pain	Lumbar function	Walking ability	Social life function	Mental health
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Sex:					
-Male	25.7±25.3	38.1±32.5	40.3±32.7	37.4±28.7	45.5±23.9
-Female	22.7±22.7	43.3±30.7	39.0±34.3	38.2±28.4	46.2±19.0
Test of significance	F= 0.421(0 .518)	F= 0 .743(0 .391)	F= 0 .043(0 .836)	F= 0 .020 (0 .887)	F= 0 .028(0 .868)
Age (Years):					
• 60-	21.5±23.9	41.6±31.2	39.8±33.8	38.2±27.9	45.6±20.7
• 70-	33.3±20.6	39.4±33.4	38.5±31.1	41.2±28.8	52.2±20.6
• 80+	36.5±26.8	30.5±35.3	41.2±36.2	27.9±34.5	36.6±31.4
Test of significance	F= 2.818(0 .064)	F= 0.504(0.606)	F= 0.019(0.981)	F= 0.655(0.521)	F= 1.451(0.239)
Level of education:					
-Illiterate	29.6±26.4	48.0±31.9	46.7±38.0	47.5±30.2	51.7±22.8
-Basic education	23.0±25.7	34.6±27.6	42.8±26.0	37.2±29.4	47.6±19.6
-Secondary education	25.2±24.4	49.5±36.6	42.0±39.0	38.1±33.4	47.3±26.1
-High education	22.5±21.1	38.1±30.4	39.1±31.2	34.9±25.3	45.5±18.5
Test of significance	F= 0.462(0.763)	F=1.365(0.251)	F= 0.920(0.456)	F=1.215(0.309)	F=1.505(0.206)
Marital status					
-Single	28.5±30.3	45.0±31.5	44.2±39.5	52.4±27.6	58.2±12.1
-Married	23.6±24.1	41.0±30.9	40.7±31.4	37.7±28.0	46.1±21.6
-Divorced	30.0±28.9	53.3±33.3	50.0±41.1	49.1±32.5	47.8±24.8
-Widow	23.5±21.8	30.8±33.3	30.0±35.1	28.6±27.0	40.4±22.5
Test of significance	F= 0.257(0.856)	F= 1.211(0.309)	F= 0.936(0.426)	F=1.690(0.173)	F= 0.972(0.409)
Occupation before retirement					
-Not working	45.4±26.9	59.8±32.4	54.5±42.6	58.2±32.9	56.7±25.6
-Housewife	25.9±22.0	42.9±31.9	39.6±36.6	37.9±29.0	48.5±20.2
-Employee	23.8±23.4	36.1±31.8	37.9±31.1	32.7±26.6	42.6±21.7
- Skilled worker	14.2±21.4	37.5±29.2	36.9±29.3	38.4±26.6	43.9±21.3
Test of significance	F= 4.643 (0.004)*	F=1.834 (0.145)	F = 0.822 (0.484)	F=2.496(0.064)	F=1.463 (0.229)
Presence of Current work					
-No	25.8±23.0	40.6±31.3	38.1±32.7	36.9±29.0	44.5±22.1
-Yes	21.6±26.4	40.0±32.7	43.0±34.7	39.4±27.7	48.2±21.2
Test of significance	F= 0.742(0.391)	F= 0.007(0.932)	F= 0.525(0.470)	F= 0.187(0.666)	F= 0.679(0.412)
Type of Current work					
-No work	25.8±23.0	40.6±31.3	38.1±32.7	36.9±29.0	44.5±22.1
-Need light physical effort	24.0±25.8	41.6.0±33.3	43.8±36.0	40.7±28.1	47.1±24.0
- Need Heavy physical effort work	18.0±27.7	37.7±33.0	41.9±34.0	37.4±28.0	49.8±16.7
Test of significance	F= 0.635(0.)	F= 0.069(0.933)	F= 0.275(0.760)	F= 0.152(0.859)	F= 0.405(0.668)

*** Significant at p value ≤0.05**

Table (VII): shows the relationship between older adults' health related characteristics and their functional abilities as measured by JOABPEQ. The table reveals a statistically significant relation between older adults' body mass index and all JOABPEQ subscales except low back pain subscale. The table also portrays the relation between practicing exercises and older adults' functional ability level where, older adults who practice exercises have the highest level of functional ability across all JOABPEQ subscales and the difference was statistically significant, P=0.001. Regarding the relation between smoking and older adults' functional ability level, the table shows statistical significant relation between smoking and low back pain subscale (0.013), lumber functions subscale (0.017) and social life function subscale (0.032). As, non-smokers older adults have the best functional ability level across these domains. Finally the table reveals a statistically significant relation between the number of health problems associated with low back pain and the level of functional ability across all JOABPEQ subscales P=0.001, those older adults who have no health problems other than low back pain, have the highest functional ability level.

TABLE (VII): RELATIONSHIP BETWEEN COMMUNITY DWELLING OLDER ADULTS' HEALTH RELATED CHARACTERISTICS AND THEIR FUNCTIONAL ABILITIES ACCORDING TO JOABPEQ SUBSCALES

Health related characteristics	JOABPEQ subscales				
	Low back pain	Lumbar function	Walking ability	Social life function	Mental health
	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD
BMI					
Underweight	33.3±35.9	16.6±14.4	16.6±16.4	27.9±22.0	31.7±22.0
Normal	34.6±28.9	60.8±34.5	62.6±33.3	52.2±29.9	59.0±23.0
Overweight	24.0±25.3	47.0±30.7	41.7±33.4	44.8±31.2	50.6±17.3
Obese I	22.0±21.4	30.4±26.8	33.0±30.6	31.1±25.9	38.8±20.3
Obese II	15.1±15.5	26.9±24.2	24.3±26.0	24.4±18.7	36.8±21.1
Obese III / Morbidly obese	14.2±11.6	29.1±25.9	21.4±18.4	20.9±12.9	38.8±8.0

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Health related characteristics	JOABPEQ subscales				
	Low back pain	Lumbar function	Walking ability	Social life function	Mental health
Test of significance	F=1.777(0.124)	F= 4.84(0.001)*	F= 4.67(0.001)*	F=3.474(0.006)*	F= 4.330(0.001)*
Practicing exercise					
No	20.7±21.6	35.5±29.3	34.5±29.1	33.4±25.6	42.2±20.3
Yes	40.7±28.6	62.5±33.4	63.5±40.7	57.4±32.7	62.0±21.3
Test of significance	F= 12.235(0.001)*	F=13.116(0.001)*	F= 13.876(0.001)*	F=12.877(0.001)*	F= 15.267(0.001)*
Smoking					
No	27.2±24.6	44.0±32.2	42.6±34.3	40.6±29.1	47.4±21.4
Yes	12.9±18.6	26.1±25.2	28.5±26.8	26.1±22.7	39.4±22.7
Test of significance	F= 6.441(0.013)*	F= 5.851(0.017)*	F=3.182(0.077)	F= 4.729(0.032)*	F= 2.400(0.124)
Number of Health problems	44.3±25.1	68.9±28.5	70.4±33.5	62.5±26.8	65.2±18.7
No	13.8±16.1	33.6±26.2	30.7±20.7	35.2±20.5	43.9±14.2
One	20.5±22.9	34.3±28.8	33.4±31.3	31.3±29.3	40.6±19.6
Two	18.1±19.6	22.4±22.4	22.2±24.3	19.3±17.5	31.2±19.7
Three or more	24.4±24.1	40.4±31.7	39.8±33.3	37.7±28.5	45.8±21.8
Test of significance	F=12.099(0.001)*	F=16.112(0.001)*	F=16.578(0.001)*	F= 16.209(0.001)*	F=17.517(0.001)*

*** Significant at p value ≤0.05**

3. DISCUSSION

Chronic low back pain is the highest commonly reported musculoskeletal complain and the third most repeatedly reported symptom in older population [26]. Increased disability and falls are among the several negative consequences that are related to chronic back pain in elderly persons. Moreover, pain-related disability can affect emotional, psychosocial, and functional capacity of the elderly [27]. Clearly, low back pain can have a variety of harmful properties on older adults, as impaired physical function and loss of independence [17]. Despite the higher occurrence of back pain in elders, surprisingly, this problem is inadequately studied [26].

This study supports that there is a relationship between chronic low back pain intensity and functional abilities of older adults and demonstrated that the more severe back pain experienced by the older adult the low functional performance they have. This study also demonstrates that obesity, smoking and lack of exercise practice have a stronger association to both low back pain intensity and functional abilities of the older adults.

Consistent with our findings, de Lucena et al [28] found that chronic low back pain creates a substantial influence on the functional capacity of the elderly. Moreover, Telci et al [29] stated that back pain among older population influence functional activities as daily living activities. In addition, Rudy et al [30] in his study comparing impact of low back pain among community dwelling older adults and controls verified that there was a noteworthy difference in all the performance based physical function subscales examined in elders with LBP compared to those who were pain-free.

The finding of our study might be allied to a sum of possible explanations. One clarification is the neuromuscular effects of pain. Chronic back pain leads to weakness of the major muscles involved in trunk stability in older people, bringing about a dependence on other more fragile muscles of the back and lower extremities to maintain stability during ambulation and other movements. Long term maladaptive strategies to maintain function may lead to damage of muscles and joints, creating a progressively debilitating cycle [31]. Another justification might be that mental effects of the long-lasting pain impede mobility. Feeling of pain is accompanied with attentional and executive function insufficiencies [32], which are in turn result in difficult mobility, falls, and functional dependence [33,34]. Further, fear of injury and pain aggravation makes people employ less physical activities resulting in physical deconditioning and a preservation of the pain and disability cycle [35].

The disease burden of obesity has been growing globally. Chronic low back pain was noticed to be connected with obesity in the latest eras [36]. Our study showed identical finding. Compared to subjects with normal weight, obese older adults reported higher rates of severe pain intensity. This finding was in line with Chou, et al [37] and Hussain et al [38]. There is no clear explanation of the mechanisms underlying the relationship between chronic pain and obesity. Some studies suggested that inflammation mechanisms were possible elucidations for this association. Others relate this to the biomechanical factors that can cause spinal loading. Moreover, excessive adipose tissue plays a role in back pain and disability. The existing study also indicated that there was a noteworthy relation between body mass index and all functional ability domains except low back pain subscale. Consistent with this result, a study claimed that obese patient with low back pain showed a reduction in range of motion of the spine, this may be related to decreased motion at both pelvic and thoracic level. The study also indicated that obesity is linked to greater lumber lordosis in patients with LBP [39].

Active lifestyle and physical functioning are, closely interrelated in older adults, and many seniors with poor health may not be able to participate in strenuous physical activities in spite of a desire to do so. It is not surprisingly that the current study illustrated that most of older adults who did not practice exercise suffer from moderate and severe back pain contrary to those who practice exercise with a statistical significant relation between exercise performance and functional abilities of older adults. This result may be attributed to the fact that exercise increases blood and nutrient circulation to the back, in turn deceasing stiffness and pain [40]. This result is in harmony with Dreisinger [41] who declared that exercises that strengthen of the lumbar and cervical extensors has been shown to significantly reduce back and neck pain. Also Henchoz et al [42] confirmed that following three months exercise program for patients with low back pain, pain severity, functional ability and muscle endurance of the back were maintained. Further study done in Canada reported that inactive subjects had an increased rate of functional disability by 33% higher than active ones with low back pain [43].

The current study revealed an association between pain intensity, functional limitations (except walking ability and mental health subscales) and smoking. This result is in line with several studies, Iizuka et al [44] in their study have concluded that there is a significant association between low back pain and smoking habit in middle aged and elderly. Shiri et al [45] have concluded in their work that the prevalence and incidence of low back pain are higher in both current and former smokers. Green et al [46] found that back pain is increased with increased smoking exposure; as back pain is advanced among present smokers than the ex-smokers or those who never smoked and that ex- smokers had a higher prevalence of back pain than who never smoked. On the other hand, Goldberg et al [47] have not confirmed the relationship between smoking and low back pain, and he further suggested that additional longitudinal studies are required to approve the evidence. The relationship between smoking and low back pain could be rationalized by the factual point that nicotine, alters the perception and threshold for pain, and increases the self-reporting of pain [48]. The literature also clarify that smoking upsurges the level of circulating pro-inflammatory cytokines, which arouse the central nervous system and may result in pain intensification [45].

Our study revealed a statistical significant relation between the number of health problems associated with low back pain and increased pain intensity and functional limitation. Similar to this finding, Alves et al [49] in their study found that older adults who were affected by five or more diseases were likely to have inadequate functional capacity. Palma et al [43] confirmed the same finding in his study. Chronic diseases are more common among the elderly, and are the most disabling. Among the chronic diseases that may affect older adults are musculoskeletal disorders as osteoarthritis, which is the most common joint disease affecting more than 80% of people older than 55 years. Arthritis of the knee and hip in particular has devastating effects on activities such as walking, climbing stairs, and self-care [50]. The current study also revealed that age and sex were not related to pain intensity and functional limitations. Same result was obtained from a Brazilian study [51] and a study done by Candotti et al [52] and contrary to the finding obtained from Ribeiro et al [53]

A major strength of this study is the use of relatively large community dwelling older adult sample size with specific data on low back pain, functional abilities and contributing factors to pain. Although with this advantage, there were few limitations. The data collected using a cross-sectional design; conclusions of association were drawn among LBP and the other variables as functional abilities. Hence, causal relationships were not determined. Another limitation was the many exclusion criteria to insure safety of the testing procedures, which forced the selection of a functioning group of older adults. Thus, the study results could not be generalized.

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4. CONCLUSION AND RECOMMENDATIONS

We can conclude based on the findings of the current study that, chronic low back pain is related strongly to functional ability limitation in community dwelling older adults with chronic back pain.

The following recommendations could be suggested

- Increase public health awareness through designed educational programs tailored based on the educational, and cultural backgrounds of elders to enforce positive health habits such as smoking cessation, practice of exercise, routine medical check up to prevent and early detect any health problem, to achieve the most favorable level of independence for older adults and decrease low back pain intensity.

- Additional researches are required to test the influence of certain nursing interferences proposed to ameliorate functional limitations due to chronic low back pain.

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