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Original Research Article

Prevalence of low back pain and associated disability among women between 45-65 in Ernakulam district Kerala: a community-based cross-sectional study

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ABSTRACT

Background: Low back pain is one of the most common health issues encountered worldwide. About 80% of the global population would have had an episode of LBP at some stage of life. Many of the musculoskeletal disorders develop in middle age and can be chronic lasting years, necessitating contact with health care providers.
Methods: A community-based cross-sectional study was conducted among 360 women in the age group of 45-65 years residing in Ernakulam (Kochi Corporation) for the past 6 months. Low back pain among women was assessed based on the Orebro musculoskeletal pain questionnaire. A modified Oswestry Low Back Pain Disability Questionnaire was used to measure the disability level. Participants were selected using cluster sampling (proportionate probability sampling). Data was analysed using IBM SPSS software version 20, Chicago USA.
Results: The mean age of study subjects was 55.49±7.01. Overall, the prevalence of low back pain was found to be 53.1%. Many women with low back pain experienced moderate disability (79.2%). The low back pain was influenced by socio-demographic variables that include age, diabetic status, presence of dyslipidaemia, presence of trauma ($p<0.05$). Disability was influenced by age, history of trauma, history of dyslipidemia, family type (joint) ($p<0.05$).
Conclusions: Prevalence of low back pain among women was comparatively higher than reported in other studies from India and was associated with a moderate degree of disability.

Keywords: Low back pain, Disability, Dyslipidaemia

INTRODUCTION

Low back pain is one of the most common health issues encountered globally. About 80% of the population would have had an episode of LBP at some stage of life. Many of the musculoskeletal disorders develop in middle age and can be chronic lasting years, necessitating contact with health care providers.[1,2]

A minority of cases of back pain result from physical causes. Back injury from road traffic accidents, or a fall in young people, as well as minor traumas, osteoporosis, fractures, or prolonged corticosteroid use in the elderly, are all antecedents to back pain of unknown origin in majority of the cases.[3] The rest is comprised mostly of vertebral infections and tumors or their metastases, which are relatively uncommon.[5] Mechanical problems and soft-tissue trauma are the other common causes of low back pain. A broken or pulled muscle and/or ligament is the

most common source of lower back pain. In a significant number, LBP is related to occupational activities. Additional causes of LBP specific to women include the biological reaction to pregnancy and childbearing, the physical burden of childrearing, and perimenopausal abdominal weight gain. Genetics has recently been discovered as a key factor in LBP.[6]

The burden of LBP worldwide is on the increase. Low back pain is the most common cause of disability in the world. Low back pain often limits mobility, interferes with normal functioning, and leads to long-term pain and impairment.[7] Low back pain and the disability attributed to it lead to a significant economic and medical burden on the individuals, community, and the health system at large, governments making it a major public health burden.[8] In India especially in rural areas, LBP is more common among women partly because of the multi-tasking that is required of women in managing a household involving taxing work schedules which tend to be strenuous and exhausting.[9]

Women have a higher average prevalence of LBP than men. Many chronic pain disorders and debilitating musculoskeletal system conditions affect women in greater numbers than men.

There have been very few studies on this subject in India, especially in Kerala. In this light, the present study aimed to determine the prevalence of low back pain and disability among women in the 45-65 age group in Kochi, Kerala, India.

METHODS

Study design

This study was a community-based cross-sectional study conducted among individuals aged (45-65 years), residing in urban areas of Ernakulam district, Kerala. The study was done over a period of 4 months (January 2021 - April 2021).

Ethical clearance: The study was approved by the Institutional Scientific

Committee and Ethics committee of the Amrita Institute of Medical Sciences IEC.

Sample size: The sample size was calculated using the formula: $(Z\alpha)^2pq/d^2$

Where $Z\left(\frac{1-\alpha}{2}\right) = 1.96$

Prevalence (p) was taken 42% as per the study done by Guna Sankar Ahdhi et al, where q=58% and absolute error 15% with 95% confidence interval, after applying the design effect of 1.5, the minimum sample size was 354.

A cluster sampling technique was used to select the study subjects from Kochi Corporation. In Cochin corporation, there are 74 divisions and 5 administrative zones from which 5 divisions were randomly selected. After obtaining informed consent from the participant's, data was collected through house-to-house visits. The total number of houses visited was 512, after excluding locked homes, absence of adult members, and non-consenting individuals, 360 participants were included in the study. The data was collected based on a standardized and structured questionnaire. Sociodemographic factors were collected and low back pain among women was assessed in the preceding month based on the Orebro musculoskeletal pain questionnaire. The body height and weight of each subject were taken by standard methods. A modified Oswestry low back pain disability questionnaire was used to measure the disability level.

The data collected were tabulated using MS excel. Statistical analysis was performed using IBM SPSS 20.0 software (Chicago USA). To test the statistical significance of the association of all socio-demographic variables with low back pain and disability Pearson Chi-square also if any cell of the expected count less than 5, Yates's continuity correction was used. To predict the most significant risk factors of low back pain and disability multivariate logistic regression analysis was performed. A p value of <0.05 was considered to be statistically significant.

RESULTS

Socio-demographic profile

Results showed that out of the 360 respondents, (53.1%) women had a history of low back pain and 20.8% were in high-risk disability. The majority of the respondents were in the age group of 56- 65 years (50.3%). Most of them were married (73.9%). It has been observed that most of them had higher secondary education (27.2%) and (42.2%) were unemployed. Among the participants (53.1%) belonged to above the poverty line (APL) category and the majority of the respondents (54.2%) had prior work exposure, (58.9%) and lived as nuclear families. Among the participants, (38.1%) of women were overweight and (38.1%) had low waist hip ratio. Among study respondents, (56.7%) had a normal mode of delivery, most of the participants had a history of diabetics (44.2%).

Table 1: Socio-demographic profile of study participants.

Characteristics	Category	Frequency (n=360)	%
Age (years)	45-55	179	49.7
	56-65	181	50.3

Continued.

Characteristics	Category	Frequency (n=360)	%
Marital status	Unmarried	28	7.8
	Married	266	73.9
	Widow	44	12.2
	Divorced	22	6.1
Education	Illiterate	14	3.9
	Primary	43	11.9
	Secondary	85	23.6
	Higher secondary	98	27.2
	Graduation	97	26.9
	Post-graduation	23	6.4
SES	BPL	167	46.4
	APL	191	53.1
	Without ration card	2	0.6
Occupation	Professional	68	18.9
	Semi professional	49	13.9
	Skilled worker	44	12.2
	Semi-skilled worker	5	1.4
	Unskilled worker	42	11.7
	Unemployed	152	42.2
Prior work experience	No	165	45.8
	Yes	195	54.2
Family type	Nuclear	212	58.9
	Joint	148	41.1
BMI	18.5-24.9	137	38.1
	25.0-29.9	124	34.4
	Above 30	99	27.5
Waist hip ratio	<0.80	137	38.1
	0.80-8.5	125	34.7
	>0.85	95	27.2
Pregnancy mode of delivery	Normal	204	56.7
	C-section	120	33.3
	Nulliparous	36	10.0
Diabetics	No	201	55.8
	Yes	159	44.2
Duration of diabetics	Less than 5 years	37	10.3
	5 years and above	122	33.9
Hypertension	No	192	53.3
	Yes	168	46.7
Dyslipidaemia	No	200	55.6
	Yes	160	44.4
Physical activity	No	146	40.6
	Yes	214	59.4
H/O of trauma	No	191	53.1
	Yes	169	46.9
H/O of surgery	No	172	47.8
	Yes	188	52.2
Social habits	No	336	93.3
	Yes	24	6.7

Table 2: Association of socio-demographic factors with LBP among the respondents.

Variables	Low-risk disability		High-risk disability		P value
	N	%	N	%	
Age (years)					
45-55 (#179)	113	63.1	66	36.8	<0.001

Continued.

Variables	Low-risk disability		High-risk disability		P value
56-65 (#181)	56	30.9	125	69.1	
Socio economic class					<0.001
BPL (#167)	59	35.3	108	64.7	
APL (#191)	108	56.5	83	43.5	
Without ration card (#2)	2	100	0	0	
BMI					<0.001
Normal (18.5 - 24.9) (#137)	122	89.1	15	10.9	
Overweight (25.0 - 29.9) (#124)	47	37.9	77	62.1	
Obesity (Above 30) (#99)	0	0.0	99	100.0	
Waist hip ratio					<0.001
Low health risk (#137)	122	89.1	15	10.9	
Moderate health risk (#125)	47	37.6	78	62.4	
High health risk (#98)	0	0.0	98	100.0	
History of diabetes					<0.001
No (#201)	119	59.2	82	40.8	
Yes (#159)	50	31.4	109	68.6	
History of dyslipidaemia					<0.001
No (#200)	119	59.5	81	40.5	
Yes (#160)	50	31.3	110	68.8	
Trauma					<0.001
No (#191)	121	63.4	70	36.6	
Yes (#169)	48	28.4	121	71.6	
Physical activity					<0.001
No (#146)	44	30.1	102	69.9	
Yes (#214)	125	58.4	89	41.6	
Prior work experience					0.247
No (#165)	72	43.6	93	56.4	
Yes (#195)	97	49.7	98	50.3	
Family type					0.069
Nuclear (#212)	108	50.9	104	49.1	
Joint (#148)	61	41.2	87	58.8	
Pregnancy - mode of delivery					0.007
Normal (#204)	82	40.2	122	59.8	
C-section (#120)	64	53.3	56	46.7	
No pregnancy (#36)	23	63.9	13	36.1	
Duration of diabetics					<0.001
No diabetics (#201)	119	59.2	82	40.8	
Less than 5 years (#37)	20	54.1	17	45.9	
5 years and above (#122)	30	24.6	92	75.4	
History of hypertension					<0.001
No (#192)	109	56.8	83	43.2	
Yes (#168)	60	35.7	108	64.3	
History of surgery					0.005
No (#172)	94	54.7	78	45.3	
Yes (#188)	75	39.9	113	54.2	
Social habits					0.910
No (#336)	158	47.0	178	53.0	
Yes (#24)	11	45.8	13	54.2	

*p value <0.05 is considered to be statistically significant

Association of socio-demographic factors with low back pain

This study revealed that socio-demographic profile was linked to LBP. The characteristics such as age, SES, waist hip ratio, BMI, trauma, history of surgery, diabetics, hypertension and dyslipidaemia, duration of diabetics, physical activity, pregnancy- mode of delivery, were found to be statistically significant ($p<0.05$) (Table 2).

Association of socio-demographic factors with disability

This study was also able to reveal that socio-demographic profile was linked to LBP associated with disability. The characteristics such as age, SES, waist hip ratio, trauma, BMI, physical activity, prior work pressure, family type, pregnancy- mode of delivery, history and duration of diabetics, history of hypertension and dyslipidaemia were found to be statistically significant. ($p<0.05$) (Table 3).

Table 3: Association of socio-demographic factors with disability among the respondents.

Variables	Moderate		Severe		P value
	N	%	N	%	
Age (years)					
45-55 (#179)	167	93.3	12	6.7	<0.001
56-65 (#181)	118	65.2	63	34.8	
SES					<0.001
BPL (#167)	108	64.7	59	35.3	
APL (#191)	175	91.6	16	8.4	
Without ration card (#2)	2	100.0	0	0.0	
Waist hip ratio					<0.001
Low health risk (#137)	136	99.3	1	0.7	
Moderate health risk (#127)	117	93.6	8	6.4	
High health risk (#98)	32	32.7	66	67.3	
Trauma					<0.001
No (#191)	174	91.1	17	8.9	
Yes (#169)	111	65.7	58	34.3	
Prior work exposure					<0.001
No (#165)	114	69.1	51	30.9	
Yes (#195)	171	87.7	24	12.3	
BMI					<0.001
Normal (18.5 -24.9) (#137)	136	99.3	1	0.7	
Overweight (25.0 -29.9) (#124)	116	93.5	8	6.5	
Obesity (Above 30) (#99)	33	33.3	66	66.7	
Physical activity					<0.001
No (#146)	92	63.0	54	37.0	
Yes (#214)	193	90.2	21	9.8	
Duration of diabetics					<0.001
Without diabetics (#201)	177	88.1	24	11.9	
Less than 5 years (#37)	27	73.0	10	27.0	
5 years and above (#122)	81	66.4	41	33.6	
Pregnancy mode of delivery					0.002
Normal (#204)	150	73.5	54	26.5	
C-section (#120)	100	83.3	20	16.7	
No pregnancy (#36)	35	97.2	1	2.8	
History of diabetes					<0.001
No (#201)	177	88.1	24	11.9	
Yes (#159)	108	67.9	51	32.1	
History of hypertension					0.002
No (#192)	164	85.4	28	14.6	
Yes (#168)	121	72.0	47	28.0	
History of dyslipidaemia					<0.001
No (#200)	179	89.5	21	10.5	
Yes (#160)	106	66.3	54	33.8	
Family type					<0.001
Nuclear (#212)	182	85.8	30	14.2	
Joint (#148)	103	69.6	45	30.4	
History of surgery					0.130
No (#172)	142	82.6	30	17.4	
Yes (#188)	143	76.1	45	23.9	

Continued.

Variables	Moderate		Severe		P value
Social habits					0.796
No (#336)	265	78.9	71	21.1	
Yes (#24)	20	83.3	4	16.7	

*p value <0.05 is considered to be statistically significant

Table 4: Multivariate logistic regression analysis among the respondents.

Risk factor for low back pain	P value	OR	95% CI	
			Lower	Upper
History of trauma (presence)	<0.001	3.117	1.916	5. 072
Age (56-65 yrs)	<0.001	2.845	1.750	4.625
History of diabetics (presence)	0.007	2.176	1.235	3.836
History of dyslipidaemia (presence)	0.004	2.088	1.269	3.435
History of surgery (presence)	0.090	1.516	0.937	2.453
Risk factors for disability	**P value**	**OR**	**95% CI**	
			Lower	**Upper**
Age (56-65 yrs)	<0.001	4.853	2.375	9.915
History of trauma (presence)	<0.001	4.318	2.213	8.425
History of dyslipidaemia (presence)	0.001	2.865	1.511	5.433
Family type (Joint family)	0.044	1.888	1.016	3.509

Multivariate logistic regression analysis

The result of multivariate logistics regression analysis showed that most significant predictors of low back pain were presence of trauma (OR=3.117, CI; 1.916- 5.072), age (56-65 yrs) (OR=2.845, CI; 1.750–4.625), presence of diabetics (OR=2.176, CI; 1.235-3.836), presence of dyslipidaemia (OR=2.088, CI; 1.269-3.435) (Table 4).

Regression analysis to predict the risk factor of disability: The result of multivariate logistics regression analysis showed that most significant predictors of disability were age (56-65 yrs) (OR=4.853, CI; 2.375-9.915), presence of trauma (OR=4.318, CI; 2.213-8.425), presence of dyslipidaemia (OR=2.865, CI; 1.511-5.433), joint family type (OR=1.888, CI; 1.016-3.509) (Table 4).

DISCUSSION

Stud In our study, women aged 45 to 65 years old had a high prevalence of (53.1%) low back pain. A recent study by Ahdhi et al reported a similarly high prevalence of LBP (42%). A study among Danish twins reported a similarly high prevalence of LBP.[10] Another research showed that having LBP at the age of 18 increased the risk of having LBP at the age of 30. In this study, the prevalence was found to be 30.8% in the age group (20-30 years).[11] This indicates that diagnosing this condition at a young age is critical to implementing primary preventive measures. Given the high prevalence, there is a demand for health education and service provision focused on these populations. Freburger et al observed in their study LBP is more common among the lower socioeconomic strata of people similar to our study.[12] The reason for looking at socioeconomic influences on common symptoms is that any disparities between social groups may be the result of avoidable environmental or lifestyle threats. Because of their increased economic demands, women of low socioeconomic status may not get enough rest during an episode of back pain, resulting in inadequate healing and recurrence of back pain, which may be unique to the Indian population.

In our study, also it was found that the maximum number of patients with backache were either unemployed or had just primary level education. The data correlates with the findings of other studies.[13-16] Non-working women such as homemakers were more prone to low back pain. This could be due to weight lifting, standing for long periods, etc. In this research, back pain was more common in women who had a vaginal delivery compared to a Caesarean procedure. This may be due to the lack of post-partum care following normal vaginal delivery. This result is in contrast to the finding of Anil Mathew et al where women who have undergone cesarean section or sterilization reported more low back pain than those who had not undergone these procedures.[17]

According to a recent systematic review of twin studies, individuals who are overweight or obese are more likely to have LBP and lumbar disc generation which is similar to our study. In our study population, LBP was quite common, and most of the people had LBP-associated disabilities (21% of the participants had severe disabilities, while 79% had moderate disabilities). According to previous studies, physical disability caused by LBP affects 10% to 40% of the general population.[18-20]

Limitation

Self-reported comorbidities were not cross-checked, for cultural reasons, physical measurements were recorded by

the respondents themselves, which could have affected the accuracy of the measurement.

CONCLUSION

Our study was a community-based cross-sectional study conducted among women in urban areas of Ernakulam District, Kerala. 53.1% of the women had low back pain and associated disability. We found the prevalence of LBP with higher odds among older age, presence of trauma, diabetics, dyslipidaemia and surgery regarding low back pain. Identification of these predisposing factors among the individuals can lead to diagnosing the condition at the earliest and preventing chronicity of the pain, thereby improving the quality of life and productivity in the Kochi corporation population. Another important finding is that majority of participants had moderate disability (79%) secondary to LBP with higher odds among older age, presence of trauma, dyslipidaemia, and joint family type. Disability intervention measures may help in reducing the impact of low back pain among women with low back pain. However, the knowledge concerning regimes that do not lead to lower back pain (LBP) or the best practice concerning diagnosing and treatment of LBP in older adults is sparse, implying a great need for further research in this area.

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