Determinants of chronic pain among adults in urban area of Udupi, Karnataka, India

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ABSTRACT

Background: Chronic pain is very common in Asian communities. It is a major cause of activity limitation and has a significant impact on individuals and society. One of the most common ailment for which patients seek for medical care is pain. This study was performed in the urban area to study the association of some of the modifiable risk factors of chronic pain.

Objective: To estimate the prevalence and associated risk factors of chronic pain among adults residing in the Urban area of Udupi Taluk in Karnataka, India.

Methods: The cross-sectional study included 360 participants of above 18 years of age. The participants were recruited using Simple Random Sampling technique from January 2017 to June 2017. Descriptive and analytical methods were used to estimate the prevalence and to identify the associated risk factors.

Results: It was observed during the study that prevalence of chronic pain for adults older than 18 years was 62%. Low back pain and knee pain were the common ailments reported. About 50% of those who reported chronic pain, had the complaint for more than 5 years and reported more than six in Visual analogue scale. The postural factors associated with chronic pain were lifting weight, bend trunk heavily during work, repetitive movement of neck, trunk and shoulder, lifting hand above shoulder level and experience of fall.

Conclusion: Present research revealed that higher prevalence of chronic musculoskeletal pain exists in the urban population of Udupi Taluk, which was influenced by repetition of same joint movement, trauma and depression irrespective of the other risk variables.

1. Introduction

Morbidity is just a tip of the iceberg of the disease condition. Morbidity is defined as "any departure, subjective, or objective, from a state of physiological wellbeing"[1] According to the World Health Organization (WHO), morbidity could be measured among some people who were ill, such as experience of illness and the duration of the disease.[2] Although chronic pain does not have a high mortality rate and it is considered to be a disease of developed countries, now with more acceptance of sedentary lifestyle it contributes high rate of morbidity in developing countries.[3] However, pain is a necessary function for preventing damage to the body.[4] Individuals experiences acute, chronic, or intermittent pain or a combination of the three which has a significant impact on one's day to day life.[1] In some cases, pain itself causes disability and it is one of the most common complaint for patient seeking medical care.[5] WHO has recognized pain as a problem of global importance[6] It is a silent epidemic which if not handled properly can

affect the quality of life of an individual with chronic pain. It is the most prevalent cause of human suffering, worldwide, giving it the status of the fifth vital sign.[7] Chronic pain is a prevalent problem in today's society with recent evidence suggestive of a persistent increase in the magnitude of the individuals with pain. The burden of chronic pain among adolescents is between 14%–24%.[8] Chronic pain increases through the ageing process and various studies found that 61% of the elderly adults have chronic pain.[9,10]

Chronic pain has an impact on occupation, relationships, and daily life of people.[11] Affective disorders such as anxiety, somatic dysfunction, depression, inability to work, disrupted social relationships and suicidal thoughts are termed as psychological distress (PD).[12,13] PD coexists with people living with chronic pain[12] The standard of life is deteriorated by chronic pain, almost more than any other disease condition. In various studies, it was found that a person with chronic pain had a traumatic experience and had thoughts of suicide; 65% of the sufferer's report difficulty in sleeping and 49% suffer from

depression. Overall, 19% of the individuals with chronic pain eventually lose their work.[14] It is more common in women than men and becomes more common as age increases.[13,8]

In developing countries, due to lack of human resources, infrastructure and non-referral in the primary care settings, there is always a chance of under-reporting and misdiagnosis of musculoskeletal pain. In addition to this, there is negligence of factors related to pain like sleep, occupation and psychological manifestations. This study was done to estimate the burden and associated risk factors of chronic pain among adults residing in the Urban area of Udupi Taluk in Karnataka.

2. Methodology

2.1. Study design, settings and eligibility criteria for selecting participants

A community-based cross-sectional study was conducted among urban adult dwellers of Udupi Taluk in Udupi district of Karnataka, India. Self-report of pain which last for at least one week and within a month of conducting the study. Also, participants of age range from 18 to 60 years were recruited from January 2017 to June 2017.

2.2. Data collection methods

A semi-structured questionnaire was used for data collection. The tool was validated by the experts in the field for use of the tool. The questionnaire had three domains: Socio-demographic Characteristics, Chronic Pain Assessment, and Occupational Factors. The Psychological Distress among chronic pain individual was assessed by using General Health Questionnaire (GHQ-28), which is a standardized questionnaire used to assess the psychological distress. It contains 28 items from the original GHQ-28, across all dimensions and comprises domains such as Somatic Dysfunction, Anxiety, Social Dysfunction, and Depression which were used to collect the data. This was administered by the para medical professional and participants took 15–20 min to complete the questionnaire. The bus stop of the ward was considered as the starting point. If there was more than one lane then random selection was done using lottery method. Each household was considered as a study unit. The selection of the households differed from one ward to another i.e. occasionally the data collection started from the house on the lane or from the middle of the lane or in some instances from the first house of lane. This was done to minimise the selection bias.

The purpose of the study was explained to participants and asked first question 'How many adults aged 18 or older who live in your household experience pain from an illness or medical condition?' "terminate if zero" If responded Yes and agree, then the consent of the study subject was taken before the interview and asked General pain assessment and the psychological distress questionnaire. If the person had reported pain for six months or more, a structured questionnaire to assess the effect of chronic pain was administered.

2.3. Sampling technique and sample size

Single Stage Cluster sampling technique was used in the study by considering each ward of Udupi Taluk as a cluster. The list of wards (35 in number) which were procured from Udupi City Municipal Council was used as the sampling frame. A sample of each ward was obtained through Probability Proportionate to Sampling (PPS) to sample size. Using PPS technique, the total number of participants from each ward was selected. The study included participants of all proportion of specific age range from 18 to 60 till the desired sample size was obtained. Total 360 participants were included in the study. Prevalence = 0.30 (Sarda k et al)[10] using formula

$$n = Z(1-\alpha/2)^2 \ P(1-P) \ /d^2$$

Z = Z value (e.g. 1.96 for 95% confidence level), p = percentage

picking a choice, expressed as decimal (0.5 used for sample size needed), d = desired level of precision.

2.4. Analysis

The Statistical Package for Social Sciences (SPSS) version 15 for Windows was used to analyze the data. Through descriptive statistics, socio-demographics were expressed as frequencies and percentages. The multiple logistic regression analysis was done to find out the factors significantly associated with chronic pain. For ease of analysis, some of the variables having more categories were merged. The variables which were merged were as follows: Age, marital status, religion, the level of education, and the level of spouse education, multiple sites of pain and family income. All the variables were included to adjust for confounding. Odds ratio and p-value ≤ 0.05 were reported for the Multiple Logistic Regression.

3. Results

A total of 360 randomly selected adults have participated in the study. The number of participants was equal among males and females. Most of the study participants were Hindus (68.1%), 81.4% were married, 35.8% had primary school education, and 55.3% of the study participants belonged to the annual income category of Rs 50000 to Rs100000. (Table 1). The prevalence of chronic pain among dwellers of Udupi Taluk was found to be 224 (62.2%). Most of the male participants with chronic pain had moderate psychological distress 125 (56%) and female had severe psychological distress 21 (52.5%) as shown in (Table 2). The major two sites of pain reported by males were Knees (43.2%) and Low Back (33.6%), whereas females reported pain at the following sites such as Low Back (34.3%), Wrist (29.3%), and Knees (29.3%)(Table 3). The lifestyle, socio-demographic and postural factors responsible for chronic pain were shown in (Table 4). The odds of getting chronic pain in the subjects in the age group 41–60 was 12.86 times (95%CI 5.83,28.34) more than the subjects in the age group 18–40 years, which was statistically significant (p = 0.001). The odds of getting constant pain in Hindus were found to be 21.48 times more when compared to Muslims, Christians and Jains, which was found to be statistically significant (p = 0.033). Individuals who were married

Table 1
Socio-demographic characteristics of the study participants (n = 360).

Variables	Category	Frequency	Percentage
Age Group (in years)	18–30	74	**20.6**
	31–40	92	**25.6**
	41–50	80	**22.2**
	51–60	114	**31.6**
Gender	Male	180	**50**
	Female	180	**50**
Religion	Hindu	245	**68.1**
	Muslim	59	**16.4**
	Christian	49	**13.6**
	Jain	7	**1.9**
Marital status	Unmarried	53	**14.7**
	Married	293	**81.4**
	Separated	14	**3.9**
Educational Level	University Graduate	54	**15**
	Higher Secondary (11th–12th)	47	**13.1**
	High School (8th–10th)	46	**12.8**
	Primary school (1st–7th)	129	**35.8**
	No schooling	84	**23.3**
Annual Income (in rupees)	50,000–1,00,000	199	**55.3**
	100,001–1,50,000	60	**16.6**
	1,50,001–2,00,000	67	**18.6**
	2,00,000–2,50,000	15	**4.2**
	No income	19	**5.3**

n = Number.

Table 2
Site of pain of study participants (n = 224).

Main site of pain	Men, Frequency (%) (N = 125)	Women, Frequency (%) N = (99)
Neck pain	12(9.6)	13(13.1)
Upper back pain	13(10.4)	7(7.1)
Lower back pain	42(33.6)	34(34.3)
Shoulder pain	26(20.8)	15(15.2)
Elbow pain	7(5.6)	9(9.1)
Wrist pain	0	29(29.3)
Hip pain	0	9(9.1)
Knee pain	54(43.2)	29(29.3)

Table 3
Psychological distress among study participants (n = 224).

Gender	Mild	Moderate	Severe	Total
MALE	30(60)	76(56.7)	19(47.5)	125(55.8)
FEMALE	20(40)	58(43.3)	21(52.5)	99(44.2)
Total	50(100)	134(100)	40(100)	224(100)

had 34.86 (95% CI 2.71, 102.34) times more chances of getting chronic pain when compared with participants who were unmarried found to be statistically significant (p = 0.006). Persisting pain was 0.107(95%CI

0.035,0.330) times less in individual who had a primary education when compared with individuals with high school which was significant (p = 0.001). The odds of having multiple sites of pain among study subjects was 2.1 times (95% CI 1.01, 4.68) more than individuals with no or single site of pain. The odds of having chronic pain among individuals who lift weight continuously during work hours for more than 5 hours had 0.042(0.013, 0.131) times less than the individuals who were not involved in lifting weight jobs and it was significant (p = 0.012). Postural factors like lifting weight in a twisted position, bend heavily with trunk, repeated the movement with arm, elbow, fingers and trunk, reach hand during work, hold hand above shoulder level, work kneeled or squatted were significant (p = < 0.005). The frequency of doctors' visits for individuals with persisting pain was eight (95%CI 3.26, 21.67) times more than participants with the irregular onset of pain and it was significant (p = 0.001).

4. Discussion

This study was to estimate the burden and associated risk factors of chronic pain among adults residing in the Urban area of Udupi Taluk in Karnataka. Most of the studies are phone based not the population based and lack substantial information for the occurrence and associated risk factors of musculoskeletal disorders and its associated pain in India.

There were major strengths in this study. First it was population

Table 4
Multiple Logistic Regression Analysis of Factors related to Chronic Pain.

Variables	Category	Chronic Pain YES Frequency (%)	Chronic Pain NO Frequency (%)	Odds ratio(95% CI)
Age Group (Years)	18–40	68(31.2)	53(70.6)	1
	41–60	154(68.8)	40(29.4)	**12.86(5.83,28.34)**
Gender	Male	125(55.8)	55(40.4)	1
	Female	99(44.2)	81(59.6)	1.63(0.89,2.99)
Religion	Non-Hindu	69(30.80)	46(33.8)	1
	Hindus	155(69.2)	90(66.2)	**21.48(1.28,6.58)**
Marital status	UnMarried	26(11.6)	27(19.9)	1
	Married	198(88.4)	100(73.5)	**34.86(2.71,102.34)**
Level of Education	University Graduate/high school	59(26.3)	42(30.9)	1
	Primary school	97(43.3)	78(57.4)	**0.107(0.035,0.330)**
	No school	68(30.4)	16(11.8)	**0.190(0.043,0.833)**
Family Income	10,000–15000	52(23.2)	15(11)	1
	> 20,000	7(3.1)	8(5.9)	**0.070(0.008,0.610)**
	5000–10000	34(15.2)	26(19.1)	0.265(0.051,1.37)
	No/ < 5000	131(58.5)	87(64.0)	0.580(0.115,2.91)
Multiple Sites of pain	No	101(74.3)	130(58)	1
	Yes	35(25.71)	94(42)	**2.1(1.01,4.68)**
Lift weight in work	No	109(80.1)	112(50)	1
	Yes	27(19.9)	112(50)	**0.042(0.013,0.131)**
Bend heavily with trunk	No	101(74.3)	130(58)	1
	Yes	35(25.7)	94(42)	**0.32(0.10,0.97)**
	Yes	112(82.4)	178(79.5)	0.50(0.19,1.31)
Repeated movement with trunk	No	99(72.8)	95(42.4)	1
	Yes	37(27.2)	129(57.6)	**4.96(1.58,6.38)**
Stretching hand during work	No	80(58.8)	138(61.6)	1
	Yes	56(41.2)	86(38.4)	**0.227(0.095,0.546)**
Hold hand above shoulder level	No	116(85.3)	155(69.2)	1
	Yes	20(14.7)	69(30.8)	**4.21(1.32,13.40)**
Work kneeled or squatted	No	131(96.3)	214(95.5)	1
	Yes	5(3.7)	10(4.5)	**0.002(0.01,0.065)**
Experience fall	No	84(61.8)	110(49.1)	1
	Yes	52(38.2)	114(50.9)	0.96(0.39,2.35)
Leave because of pain	No	79(58.1)	123(54.9)	1
	Yes	57(41.9)	101(45.1)	2.19(0.76,6.30)
Visited doctor in last 6 months	No	69(50.7)	63(28.1)	1
	Yes	67(49.3)	161(71.9)	**8.41(3.26,21.67)**
Pain being treated any way	No	95(69.9)	142(63.4)	1
	Yes	41(30.1)	82	0.72(0.276,1.90)

CI = Confidence Interval.

based and target population was the general population which include participants from young, middle age, adults, working women, Teachers, police and drivers etc. Second this study used Probability Proportionate to Sample Size (PPS technique) which means all the eligible participants had chance to include in the study from all the wards of Udupi Taluk (Karnataka).

There were some limitations in this study. As this study is population based and include the participants who self-report of pain so could be a chance of recall bias. Second this study could not be able to focus on type of psychological distress.

Global prevalence rates of chronic pain (International Association of Study Pain criteria specifies at least six months) range from 11.5–55.2%[15], with a weighted mean prevalence of 35.5% across the nation.[11] The present study reported the prevalence of chronic pain as 62.2% in general population. The prevalence of chronic pain was 30.2% in Hongkong[13] and 74% in Srilanka.[16] Chronic pain if left untreated, is associated with general physical, psychological, and psychological distress. Employment, daily activities, and measured dimensions of general health are increasingly and negatively affected by the presence of chronic pain.[17]

The present study reported moderate psychological distress among study subjects with chronic pain which was 60.1% and severe psychological distress was 17.3% in general population. Another study indicated that 30% subjects had the major depressive syndrome and 70.1% suicidal thoughts among individuals with chronic pain in a clinic in Tamil Nadu. These patients were dependent on medications and on care givers contributing to the development of behavioural patterns of general inactiveness. Thus, due to these inter-related factors, chronic pain patients were subjected to disabilities.[8]

In addition to the negative psychological and physiological effects, pain if not managed properly can impose a heavy economic burden. In adding to lost productive time, chronic pain increases healthcare utilisation owing to more regular primary care appointments and hospital admissions (a 2-fold increase) as well as emergency department visits (a 5-fold increase), as compared to individuals without chronic pain.[18] Although the high variation of chronic musculoskeletal pain is evident in different regions of the world, from the clinical chapters, it emerges clearly that the women subjects have higher odds of suffering from pain than men.[19] Women in the present study also had higher risk of both moderate and severe pain than men, and it is not unexpected as advancing age, coupled with menopausal decrements of bone health exacerbates pain. In India, every third woman is osteoporotic and consequently, osteoporosis-related high fracture risk, and declining Bone Mineral Density (BMD) at forearm, neck and lumbar spine worsen the propensity of musculoskeletal pain. It has also been substantiated by other population-based cross-sectional studies that women often have more musculoskeletal pain problems than men.[8,15]

Epidemiological studies have derived the inverse relationship between socioeconomic status and musculoskeletal pain. British cohort study had reported that lowest social class had three-fold increased risk of widespread chronic pain in comparison to highest social class.[20] Another study had reported that subjects living in less affluent areas have higher chances of widespread pain, physical disability, mental distress and low life satisfaction in comparison to subjects living in affluent areas.[11] In a 15 month follow-up study, subjects belonging to moderate and less affluent areas were more likely to have widespread chronic pain.[14] However, after adjusting the psychological factors in multivariate logistic regression, this impact was not evident suggesting that socioeconomic status which in many studies had been based upon home ownership, education level and employment status was not a risk predictor for musculoskeletal pain, unless residual confounding of other risk factors such as depression, anxiety and sleep quality are not adjusted appropriately.[21] Comparable results had been observed in the present study in multiple logistic regression analysis socioeconomic statuses were observed to influence pain substantially when adjusted for the effects of other variables. It suggests that sedentary lifestyle was

not an intransigent variable but influenced by other co-existing risk variables.

The effect of pain on PD and vice versa was not easy to understand because of their usual co-existence and bidirectional relationship. It has been observed that pain threshold was reduced in subjects having PD whereby somatic preoccupation may be the primary symptom. Almost 50 percent of the depressed patients suffering from depression report pain in their lifetime. In the primary care setting the complex coexistence of pain and PD is largely overlooked and most of the times, PD is considered as an artfact of musculoskeletal pain, which may lead to poor prognosis, misdiagnosis and under-treatment of existing pain.[19]

Acknowledgements

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