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Prevalence of Joint Pain is Higher Among Housewives of Urban than Rural Housewives in Bangladesh

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ABSTRACT

Activities, environment, work style, living standards of housewives in Bangladesh vary from place to place. Housewives face many musculoskeletal problems related to housework and quality of life. Hence the aim of our investigation is to investigate the prevalence of joint pain among rural and urban housewives of Bangladesh. An attempt was made to compare joint pain in urban and rural housewives. A sample was selected to assess and comparison of joint pain prevalence among 400 unemployed urban and rural housewives aged 25–60 years in Bangladesh. Regression analysis was performed on their socio-economic and joint pain information through interviews with questionnaires. Data analysis shows that urban housewives have relatively higher prevalence of joint pain than rural housewives and it is 70.5% and 58.5% respectively. Odds ratio (OR) and 95% confidence interval (CI) comparing joint pain in Bangladeshi housewives adjusted for age and BMI showed that the prevalence of knee and low back pain was highest and was associated with age and BMI. This study showed that joint pain was significantly higher in urban housewives compared to rural housewives. Bangladeshi housewives suffer from knee and lower back pain the most. Their joint pain prevalence is increases with age and BMI. Joint pain in housewives may be related to obesity, occupational differences and environmental factors. In addition to daily household work, urban housewives can perform some simple physical exercise regularly, which can improve their mobility and strength as well as reduce the rate of obesity.

INTRODUCTION

Joint pains are more usually among the senior citizen, which is lead to movement difficulty, loss of quality of life, and enhancement health care costs. (Kiyoshi *et al.*, 1999) Joint pain can be perceived in several parts of the body. Mobility problems are mass common physical problems of the elderly. Many elderly person suffer from many health related issues and complexity due to prolonged inactivity such as musculoskeletal pain, bony and postural deformities and ADL problems. (Chowdhury *et al.*, 2021) A previous study investigating men and women found that women had a higher prevalence of musculoskeletal pain than men. (Bihari *et al.*, 2011) A previous worldwide research exhibited that female are physically more deactivate than male in Bangladesh as in m several countries, for which the possibility of contracting many non-communicable diseases increases. (WHO, 2018) Joint pain are discommodity, pain or inflammation that originates from any portion of the joint-such as bone, tendons or muscles, cartilage and ligaments. But joint pain generally refers to include clinical syndromes such as inflammation, osteoarthritis or degenerative disorders, nerve compression conditions and, as well as low well standard disorders like as myalgia, other body area pain and low back pain are not responsible to pathology. Body areas usually involved are the Neck, low back, upper limb (shoulder, forearm, and wrist) though at present the lower extremity has obtained more attention. (Punnett & Wegman., 2004) Various factors influence women's health are lack of

coordination of work of men, women and family, considering the role of the leadership of the household as well as women's service as a minor role, patriarchal society etc. Interest has been expressed in conducting research in many countries to identify symptoms of joint pain and to identify its relationship with occupational factors. (Tinubu *et al.*, 2010) It is trustify that employment is one of the major effective factors on housewives quality of life, (Farlinger S., 1996) the main point being that women's empowerment is directly related to a woman's educational status and her job and thus is expected to affect her quality of life. (Harriet and Sen., 2000) Housewives are often responsible for works like as sweeping, cleaning the garbage, cleaning bathrooms and toilets, cooking, cleaning door and windows, washing clothes and beds, and taking care of the needs of the entire family, which can be associated with various physical contact stresses and result in joint pain. (Kalra1 & Bhatnagar., 2017) A prior research showed that the prevalence of joint pain is higher in women than in men. Elderly male suffer from MS pain less often than normal and aged women. The prevalence of pain in women in Quebec, Canada and Ontario, USA was reported to be 50%, 65% and 79%, respectively. (Fazli B *et al.*, 2016) There had been several studies on the prevalence of joint pain in specific groups and populations, (Andersson *et al.*, 1999) but comparatively small number of comparisons between populations. (Hameed and Gibson., 1997) If clear variety in the prevalence of joint pain symptoms among the populations can be shown, this may assistance guide

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to investigate of significant etiological factors. In this investigation, we compared the proportion of specific joint pain among Bangladeshi housewives in a rural district of Bangladesh with that of urban/city women in Bangladesh, adjusted for age and body mass index.

Operational Definitions

Joint Pain

Participants were illustrated with a basic diagram of the human skeleton (a stick person) and were asked for each joint 'Do you regularly suffer from any swelling, pain or stiffness?'. Data is collect on the neck, back, and separately for the both sides of the body for shoulders, elbows, wrists, hand/fingers, hips, knees, ankle, and feet/toes. Joint pain was assessed as a problem with respondents recording whether they had or had previously had mild, moderate or severe pain in any joint.

LITERATURE REVIEW

Aoyagi K *et al.* (2020) conducts a study in Hawaii, Japan to find out that joint pain prevalence is higher in rural Japanese housewives than in urban Japanese-American housewives. Social factors such as agricultural performance to the range of joint symptoms. The aim of their study was to explore joint pain prevalence and the probable role of the environment in Japanese urban and rural housewives of Hawaii. They surveyed 222 rural housewives and 638 urban housewives aged 60-79 to explore pain in specific joints. Their results showed that 70% of Japanese and 50% of Hawaiian housewives had one or more joint pain. Among the joints, 36% of Japanese housewives aged 60-69 and 53% of housewives aged 70-79 had knee pain, whereas in Hawaii knee pain affected only 20% of housewives of both age groups. The odds ratios (and 95% CI) for knee pain in Hawaii compared with Japan were 4.0 (2.2, 7.4) and 3.2 (2.1, 4.8). Ankle, elbow, and shoulder pain were abnormally high in Japan compared to Hawaii.

In 2015, this year to propulsion a study in India to find out the outbreak of pain in the lower back of non-working rural housewives. Living, working, and social traditions differ significantly between housewives in urban and rural areas, so it is impossible to generalize between rural and urban housewives. Therefore, the objective of their study was to investigate the outbreak of lower back pain among rural-unemployed housewives. The researchers took a population of 301 non-working rural housewives between the ages of 30-70 in Kanpur. They observed and interviewed all housewives about low back pain, disability, and musculoskeletal discomfort, using the Hindi version of the Nordic Musculoskeletal Scale questionnaire. Their study showed LBP prevalence in 83% of rural housewives and more than 50% of these women had severe disabilities. Back pain in housewives has been shown to have a social burden associated with their disability.

MATERIALS AND METHODS

Study design and participants

In this cross-sectional study, participants were housewives living in rural and urban Bangladesh. Data was collected from 400 participants (200 urban and 200 rural housewives) aged 25 to 60 years in rural and urban Bangladesh who were apparently healthy, mobile housewives. Regarding the specific eligibility criteria for participants in this investigation, we included housewives aged 25 to 60 years and currently living in rural and urban Bangladesh, and we excluded men as well as unmarried and pregnant women. All data collected from August 2022 to December 2022.

Data Measurements

A face-to-face interview was conducted while collecting data for this study and adequate precautions against COVID-19 were taken. The questionnaire was first developed in English and later translated into Bengali. However, the local language was used to communicate with the respondents. Then an orientation was organized among the collectors along with field tests and finally data was collected through door to door questionnaires from the housewives. The project was organized in Dhanmondi, Mirpur, Uttara, Shyamoli, Mohammadpur, Newmarket, Kalyanpur areas of Dhaka city, Bangladesh and rural areas of Cox's Bazar, Charfashion, Feni, Pabna, Gaibandha and Dinajpur districts of Bangladesh. We collected data from them with their permission. The survey asked subjects, using only Bengali words, "Have you had pain, swelling, pain, or tenderness in your joints most days for at least a month (currently or in the past)?". 1 response box on each sides of the body (yes and no) for each joint (shoulder, elbow, wrist, hand/finger, neck, upper back, middle, lower back, hip, knee, ankle and foot). We measured housewives' weight and height without shoes in light clothing. Weight (kg)/height (m)² was measured and then converted to body mass index (BMI).

Statistical Analysis

Investigators were used t test to evaluation statistical importance when comparing the characteristics of subjects between urban and rural Bangladeshi areas. The χ^2 test was used to evaluate between-group differences for categorical variables. All answer sheets were checked for exactness, completeness and internal consistency. Inconsistent data is discarded. Accurate data were entered into SPSS version 23 for analysis. Logistic regression was used to evaluate the prevalence of specific joint pain in two populations, age and BMI (both as continuous variables), with interaction tests. Qualitative data were used for thematic content analysis. Analyzes were limited to 200 urban Bangladeshi housewives and 200 rural housewives aged 25 to 60 years, to provide a comparable age range for both populations.

RESULTS

Characteristic of Respondents

Table 1 showing the characteristics of urban and rural participants in Bangladesh. The mean age and height of urban and rural housewives were similar but the mean weight of urban housewives was five kg higher than rural and BMI was significantly higher than that of rural housewives ($p < 0.05$)

Prevalence of joint pain

The prevalence of one or more joint pain was approximately 70.5% in urban and 58.5% in rural housewives. All other joint pains except elbow, upper back and ankle joint pain were discovered to be significantly different in Bangladeshi housewives. Shoulder, wrist and hand pain in rural women was twice or more than that of urban women and on the other hand urban women

Table 1: Age, BMI characteristic of the Respondents

| Characteristic | In urban Bangladesh | | In rural Bangladesh | |
|--------------------------------------|---------------------|--------|---------------------|--------|
| | Range | Median | Range | Median |
| Age (years) | 25 – 60 | 45 | 25 – 60 | 44.50 |
| Height (cm) | 153 – 165 | 158 | 147 – 165 | 158 |
| Weight (kg) | 48 – 86 | 60 | 40 – 85 | 55 |
| Body mass index (kg/m ²) | 18.3 – 33.3 | 24.25 | 16 – 35.4 | 22.2 |

had significantly more neck, mid back, lower back, hip, knee and foot joint pain than rural women, which was significantly higher in the 43–60 age group than in the 25–42 year group (Table 2)

Low back pain was the most common places of joint pain in each urban and rural women in Bangladesh, affecting at least 25% of women in both populations. Other common locations of joint pain in both urban and rural Bangladeshi

Table 2: Frequency (%) of housewives with joint pain in rural and urban housewives in Bangladesh

| | In urban Bangladesh | | | In rural Bangladesh | | |
|------------------------|---------------------|-----------|------------|---------------------|-----------|------------|
| | 25 - 42 | 43 – 60 | Total | 25 – 42 | 43 – 60 | Total |
| Age group (y) | | | | | | |
| Number of participants | 76 | 124 | 200 | 96 | 104 | 200 |
| Any joint pain | 49 (64.5) | 92 (74.2) | 141 (70.5) | 41 (42.7) | 78 (75.0) | 117 (58.5) |
| Shoulder | 4 (5.3) | 13 (10.5) | 17 (8.5) | 12 (12.5) | 22 (21.2) | 34 (17.0) |
| Elbow | 4 (5.3) | 6 (4.8) | 10 (5.0) | 5 (5.2) | 6 (5.8) | 11 (5.5) |
| Wrist | 1 (1.3) | 4 (3.2) | 5 (2.5) | 4 (4.2) | 10 (9.6) | 14 (7.0) |
| Hand | 3 (3.9) | 2 (0.8) | 4 (2.0) | 6 (6.3) | 7 (6.7) | 13 (6.5) |
| Neck | 6 (7.9) | 21 (16.9) | 27 (13.5) | 6 (6.3) | 8 (7.8) | 14 (7.0) |
| Upper back | 1 (1.3) | 6 (4.8) | 7 (3.5) | 4 (4.2) | 4 (3.8) | 8 (4.0) |
| Mid-back | 8 (10.5) | 15 (12.1) | 23 (11.5) | 6 (6.3) | 6 (5.8) | 12 (6.0) |
| Low back | 25 (32.9) | 44 (35.5) | 69 (34.5) | 16 (16.7) | 35 (33.7) | 51 (25.5) |
| Hip | 11 (14.5) | 6 (4.8) | 17 (8.5) | 1 (1.0) | 6 (5.8) | 7 (3.5) |
| Knee | 11 (14.5) | 28 (22.6) | 39 (19.5) | 4 (4.2) | 19 (18.3) | 23 (11.5) |
| Ankle | 3 (3.9) | 3 (2.4) | 6 (3.0) | 3 (3.1) | 5 (4.8) | 8 (4.0) |
| Foot | 8 (10.5) | 9 (7.3) | 17 (8.5) | 2 (2.0) | 4 (3.8) | 6 (3.0) |

women were shoulder, neck and knee pain, affecting around 10% of women in both populations. Bangladeshi City women were twofold as likely to have back, hip and foot pain as rural women, but the shoulder, hand and wrist pain prevalence was significantly higher in rural women.

The prevalence of joint pain increased with age; For example, neck pain in urban women increased from 8% between 25-42 years to 17% between 43-60 years, and knee pain from 14.5% between 25-42 years and 22.6% between 43-60 years (for all ages combined 19.5%). Again, shoulder

Table 3: Odds ratios (95% confidence intervals) of joint pain comparing women in urban Bangladesh with women in rural Bangladesh

| | Age Adjusted | BMI Adjusted |
|----------------|----------------------|----------------------|
| Any joint pain | 1.064 (1.039, 1.090) | 1.229 (1.140, 1.326) |
| Shoulder | 1.038 (1.005, 1.071) | 0.978 (.895, 1.068) |
| Elbow | 1.035 (.987, 1.085) | 1.004 (.883, 1.143) |
| Wrist | 1.039 (.988, 1.092) | 0.994 (.866, 1.140) |
| Hand | 0.999 (.952, 1.048) | 0.878 (.750, 1.028) |

| | | |
|------------|----------------------|----------------------|
| Neck | 1.043 (1.006, 1.081) | 1.070 (.976, 1.173) |
| Upper back | 1.070 (1.007, 1.138) | 0.979 (.837, 1.144) |
| Mid-back | 1.012 (.976, 1.049) | 1.060 (.961, 1.169) |
| Low back | 1.030 (1.007, 1.054) | 1.060 (.995, 1.129) |
| Hip | 0.992 (.950, 1.036) | 1.273 (1.135, 1.428) |
| Knee | 1.075 (1.039, 1.112) | 1.331 (1.215, 1.459) |
| Ankle | 0.979 (.927, 1.034) | 1.158 (1.003, 1.337) |
| Foot | 1.002 (.959, 1.046) | 1.086 (.966, 1.220) |

pain in rural women ranged from 12.5% between 25-42 years to 21.2% between 43-60 years and LBP ranged from 16.7% between 25-42 years to 33.7% between 43-60 years (crude prevalence of 25.5% for all ages combined). The prevalence of hip and foot pain did not vary consistently between age groups in urban communities with higher prevalence in younger age groups ranging from 14.5% to 4.8% and 10.5% to 7.3%, respectively.

Comparison of joint pain between urban Bangladeshi and rural Bangladeshi women

The odds ratio (OR) and 95% confidence interval (CI) comparing joint pain in Bangladeshi housewives adjusted for age and BMI are shown in Table 3. The age adjusted OR for knee pain was 1.075, and BMI was 1.331 and age adjusted OR for lower back pain was 1.030, and BMI was 1.060. BMI-adjusted prevalence of cervical, hip and feet pain was lower in rural than urban women (BMI AOR = 1.070, 1.273 and 1.086 respectively) Moreover, age-adjusted prevalence of shoulder, wrist and upper back pain was richer in rural than in urban women (age-adjusted OR = 1.038, 1.039 and 1.070, respectively). The prevalence of lower back and knee joint pain was common in urban and rural women compared to other joints. Shoulder, elbow, and wrist pain were more common in rural than urban areas, but mid-back, hip, and foot joint pain were more common in urban than rural areas.

DISCUSSION

Comparing urban and rural populations among country residents by birth can help identify factors accountable for assessed distinctions in disease by receiving benefits of increased variability in social and environmental factors. (Harriet and Sen Presser, 2000) Finding that pain frequency distinctions are limited to specific joints advises potential advantages to find etiological factors. Prior research have shown that mental factors (include factor connected to job services) are related with joint pain outcomes. (Bongers *et al.*, 1993) Our investigation excludes employed housewives, hence information on employment of housewives is not available.

However, rural areas of Bangladesh are primarily agricultural, whereas Dhaka is an urban/municipal area. In rural areas, many housewives have to be attached to housework, livestock rearing and agriculture, whereas housewives in Dhaka city have improved living conditions compared to villages, so their housework is much easier

and they can spend enough free time. Thus, the differences in joint pain frequencies reported here may be partially attributable to work differences such as current work inactivity, work style, sedentary lifestyle, work length, or psychosocial factors.

Cultural distinctions another than work may also inhibit the tendency to report symptoms and can partially account for the observed variation in joint pain prevalence. Differences in social disadvantage between city and rural Bangladesh may partially demonstrate variation in reported joint pain rather than distinction in diseases such as fractures or degenerative disease. However, such a bias would be identical to the observed differences in joints for both urban and rural areas, so such cultural attributer are possibly not significant in this case.

In this investigation, we used logistic regression for prevalence of certain joints pain in between urban and rural housewives to compare, adjusting for age and BMI. Adjustment effect of BMI on association of joint pain among housewives in Dhaka city. Those with a higher BMI had a higher prevalence of joint pain. However joint pain was related with BMI in our research, and obesity is one of the risk factors for knee and other joint pain in housewives, (Aro and Leino., 1985) obesity is slightly more likely than other (as yet unknown) risk factors to explain the difference in joint pain prevalence between urban and rural women in Bangladesh seems important.

Logistic regression evaluated the efficiency to control of age differences for any potential confounders. We found some evidence in our investigations that the prevalence of joint pain enhancement with age in urban and rural Bangladesh, as previously found, and these may influence the estimated proportion of knee pain and other joint prevalence. In logistic regression, adjustment for age of housewives suggests that the relation between age and joint pain is same for both rural and urban women. To compare these data, the reciter may also compare the particular age prevalence rate given in Table 2, which estimates are unaffected by the logistic regression.

CONCLUSIONS

The findings of this study investigated the prevalence of joint pain among housewives in Dhaka city and rural areas in Bangladesh. In summary, this study showed that the important difference between housewives aged 25-60 years was that urban housewives had significantly higher prevalence of joint pain than rural housewives. Bangladeshi

housewives are most prone to knee and lower back pain. Neck, middle back, hip and foot pain were significantly higher among urban housewives than rural housewives respectively and correlated with BMI. On the other hand, shoulder, wrist and hand pain was relatively higher among rural housewives than urban housewives. Joint pain was more likely to increase with increasing age and BMI. Joint pain may be related to obesity, environmental factors and occupational differences. In addition to housework, general urban housewives can do some physical exercise, which can increase their lateral mobility and reduce the obesity rate.

Limitation of the Study

Limitations of the study several limitations are present in our study. Our research had financial limitations as there was no funding. So our study was organized among only 400 people in remote areas of Bangladesh. We conduct physical examinations and preliminaries we detected joint pain by radiographs, radiographs were not available to evaluate degenerative changes, arthritis or fractures. As the study was a cross-sectional method, we cannot prove whether there was any difference between body weight, disability and size at the onset of joint pain. Potential differences in joint pain between urban and rural housewives in Bangladesh are a potential source of bias.

Ethical Approval

The motive and goals toward with its benefits, risks and procedure was explained in the research to the respondents in easily. Information was accepted from every respondents by use perceive native language. The researcher first introduced himself with respondents. Then the researchers was give them the assurance this facts of the responders will be usage just for the research purpose. The researchers tell them that their name will be hidden secret. All kind of privacy is confirmed and any resections from the respondent are first priority. They also told this information will only use for benefit of Physiotherapy profession and the improve health with decrease hazard.

Declaration of Competing Interest

The authors have no competing interests to declare.

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Author Contributions

Corresponding author: conceived and designed the paper; analyzed and interpreted the data; contributed materials,

analysis tools, or data; and wrote the paper. All co-authors: performed experiments, collected and analysis the data. Data access, responsibility, and analysis
Corresponding author had full access to all the data in the study and took responsibility for the integrity of the data and the accuracy of the data analysis.

REFERENCES

- Aoyagi, K., Ross, P. D., Huang, C., Wasnich, R. D., Hayashi, T., & Takemoto, T. I. (1999). Prevalence of joint pain is higher among women in rural Japan than urban Japanese-American women in Hawaii. *Annals of the rheumatic diseases*, 58(5), 315-319. <http://dx.doi.org/10.1136/ard.58.5.315>
- Andersson, H. I., Ejlertsson, G., Leden, I., & Rosenberg, C. (1993). Chronic pain in a geographically defined general population: studies of differences in age, gender, social class, and pain localization. *The Clinical journal of pain*, 9(3), <http://doi.org/174-182>. 10.1080/028134399750002700
- Aro, S., & Leino, P. (1985). Overweight and musculoskeletal morbidity: a ten-year follow-up. *International journal of obesity*, 9(4), 267-275.
- Bongers, P. M., de Winter, C. R., Kompier, M. A., & Hildebrandt, V. H. (1993). Psychosocial factors at work and musculoskeletal disease. *Scandinavian journal of work, environment & health*, 297-312. <http://doi.org/10.5271/sjweh.1470>
- Bihari, V., Kesavachandran, C., Pangtey, B. S., Srivastava, A. K., & Mathur, N. (2011). Musculoskeletal pain and its associated risk factors in residents of National Capital Region. *Indian journal of occupational and environmental medicine*, 15(2), 59. <http://doi.org/10.4103/0019-5278.90375>
- Chowdhury MOSA, Khatun R, and Pervin S., (2021). Prevalence of activity with mobility disabilities among senior citizens in a selected old home. *Eur. J. Med. Health Sci.*, 3(5), 88-102. <https://doi.org/10.34104/ejms.021.0880102>
- Farlinger S. (1996). Quality of life for women. Quality of life for women | SpringerLink. *Soc Indicators Res*, 39, 109–119.
- Fazli, B., Ansari, H., Noorani, M., Jafari, S. M., Sharifpoor, Z., & Ansari, S. (2016). The prevalence of musculoskeletal disorders and its predictors among Iranians' Housewives. *Epidemiology and Health System Journal*, 3(1), 53-62.
- Gupta, G., & Nandini, N. (2015). Prevalence of low back pain in non working rural housewives of Kanpur, India. *Int J Occup Med Environ Health*, 28(2), 313-20. <https://doi.org/10.13075/ijomeh.1896.00299>
- Harriet B, Sen Presser G. (2000). Women's empowerment and demographic processes. New York: Oxford University Press; Women's Empowerment and Demographic Processes - Harriet B. Presser; Gita Sen - Oxford University Press (oup.com)
- Hameed, K., & Gibson, T. (1997). A comparison of the prevalence of rheumatoid arthritis and other

- rheumatic diseases amongst Pakistanis living in England and Pakistan. *Rheumatology*, 36(7), 781-785. <http://doi.org/10.1093/rheumatology/36.7.781>
- Kalra, S., & Bhatnagar, B. (2017). Prevalence of musculoskeletal disorder among housewives. *International Research Journal of Engineering and Technology (IRJET)* e-ISSN, 2395-0056.
- Kagan, A., Harris, B. R., Winkelstein Jr, W., Johnson, K. G., Kato, H., Syme, S. L., ... & Tillotson, J. (1973). Epidemiologic studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii, and California: demographic, physical, dietary, and biochemical characteristics. *Journal of chronic diseases*, 27, 345–64. <http://doi.org/10.1093/oxfordjournals.aje.a112188>
- Laura Punnett, David H Wegman (2004). Work-Related Musculoskeletal Disorders: The Epidemiologic Evidence and the Debate. *J Electromyogr Kinesiol*, 14(1), 13-23. <http://doi.org/10.1016/j.jelekin.2003.09.015>
- Tinubu BM, Mbada CE, Oyeyemi AL, Fabunmi AA. Work-related musculoskeletal disorders among nurses in Ibadan, South-west Nigeria: a crosssectional survey. *BMC Musculoskeletal disorders*, 11(1), 12. <http://doi.org/10.1186/1471-2474-11-12>
- World Health Organization (WHO), 2018. Available on: WHO Bangladesh | World Health Organization