

To Assess Pain and Risk of Work-Related Musculoskeletal Disorders in Home Health Care Providers of Pune City

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ABSTRACT

This study aimed to assess pain and risk of work-related musculoskeletal disorders amongst home health care providers of Pune City. The current observational study included 114 participants who had completed the General Duty Assistant course and had more than 1 year of experience. The outcome measures used were Numeric Pain Rating Scale and Rapid Entire Body Assessment. The participants filled the evaluation proforma. In pain evaluation, they specified of having any musculoskeletal pain as well as the pain location. The participants rated their pain on Numeric Pain Rating Scale. Then, the major tasks were identified. Rapid Entire Body Assessment was evaluated while the participants were performing their tasks. The results showed that in pain evaluation, 73.68% experienced musculoskeletal pain at present. The distribution of pain locations states that 46% had pain in the back, 20% in the neck, 19% in the shoulders, 13% in the knees and 1% in the wrist and foot. Using Numeric Pain Rating Scale, the participants had moderate pain on activity (4-6) while the participants had none pain at rest (0). The participants had a high-risk score of 8.53 while they performed patient transfers activities. The study concluded that home health care providers had moderate pain on activity with maximum pain in the back region. The home health care providers are majorly involved in patient transfers activities followed with patient grooming activities. They had a medium to high risk of acquiring work-related musculoskeletal disorders.

Keywords: Home health care providers, work-related musculoskeletal disorders, General Duty Assistant, Numeric Pain Rating Scale, Rapid Entire Body Assessment Scale, Pune City.

INTRODUCTION

Home health care is one of the fastest growing sectors in the health care industry, with 66 percent growth projected over the next 10 years. The sector is large, and it employs over 1.3 million workers in a variety of occupations, which includes a gross amount of 1.2 million aides and personal assistants. By 2005, globally there

were over 20 thousand home care agencies providing home care to an estimate of 8 million individuals. This represents only a fraction of the true number of home care patients, as many patients receive informal care through non-Medicare-certified agencies or individuals. In general, the types of home health care agencies are as follows: (1) certified home health agencies

(CHHAs), (2) long-term home health care programs (LTHHCPs), and (3) licensed home care services agencies (LHCSAs). CHHAs are the agencies which are authorized to serve both Medicare and Medicaid recipients in need of short-term skilled nursing care and to provide nursing, home health aide, personal care, and homemaker and housekeeper services.^[1]

A caregiver is defined as a person that is responsible for caring for a sick or dependent person, facilitating the performance of their daily activities, such as feeding, personal hygiene, providing routine medication and accompanying them to the health services, or carrying out other things required in their daily lives.^[2] The formal caregivers include the following - nurses, nursing assistants, physicians, social workers, and rehabilitation therapists who possess the knowledge, skills, and empathic attitudes associated with patient-related care.^[3] General Duty Assistants work in a hospital environment, as well as in an inpatient rehabilitation facility and they may also work at homes of sick patients. They also work in collaboration with (and usually under the supervision of) doctors, nurses, and other healthcare providers to deliver the prescribed healthcare services to their patients.^[4]

Multifactorial “work-related” diseases are often more common than occupational diseases and therefore they deserve adequate attention by the health services.^[5]

Healthcare profession is known to be at a high risk for work related musculoskeletal disorders (WMSDs). Musculoskeletal disorders are responsible for one third of sick leaves in health care workers. It appears that even in developed countries, work-related musculoskeletal disorders (WMSDs) are under-reported among the healthcare providers. It is much neglected in the developing countries. India has been battling traditional public health problems such as communicable diseases, malnutrition and inadequate medical care, which are caused by fast-growing population, apart from the occupational

health problems. Musculoskeletal disorders (MSD) are one of the major occupational health problems in India and estimates have shown that it contributes to about 40% of all costs towards the treatment of work-related injuries. The healthcare professionals, particularly those who are in direct contact with patients, are reported to be vulnerable to acquire musculoskeletal disorders (MSDs) during the course of their work routine.^[6]

Ergonomic risk analysis methods are divided into three categories. They are divided into three types - recording method, systematic observational method and direct measurement method. Rapid Entire Body Assessment (REBA) is categorized as a systematic observational method. Rapid Entire Body Assessment (REBA) is a preferable assessment tool because it is suitable for workplace use, fast, has practical results, is economical, and does not require a device which prevents the execution of the employee’s work. This method is a simple observation-based method and is designed to be sensitive to the types of unpredictable working postures that exist in other service sectors, especially in the healthcare sector.^[7]

Health care professionals are prevalent to musculoskeletal disorders due to their job demands. As home health care providers also provide patient care services in a home care setting, their job demands are interlinked to those of health care professionals working in a hospital setting, therefore, the present study aims to assess the pain using Numeric Pain Rating Scale (NPRS) and risk of work-related musculoskeletal disorders using Rapid Entire Body Assessment (REBA) Scale amongst home health care providers of Pune City.

MATERIALS & METHODS

An observational study was carried out among 114 home health care providers working in an in-patient setup facility in the age group of 20-40 years both males and females who had completed general duty

assistant (GDA) course and who had more than one year of experience. They had daily work of 12-24 hours and their frequency of working days in a week was 6-7 days/week. The study was conducted by administering an evaluation proforma which consisted of their demographic data. Along with it, responses to other questions were noted down like - use of any assistive devices, help from relatives, colleagues, height of the bed, Absenteeism or leaves due to musculoskeletal condition specific to the condition, whether they had any musculoskeletal condition, if they did, they were asked whether they had taken any treatments for it in the past one year. In pain evaluation, any musculoskeletal pain present, specific to the location, was graded on Numeric Pain Rating Scale on activity as well as on rest. The Rapid Entire Body Assessment tool was used to examine the risk of working posture of the participations when they performed their major task.

STATISTICAL ANALYSIS

The statistical analysis was performed using software Minitab (Minitab, USA) version 20.

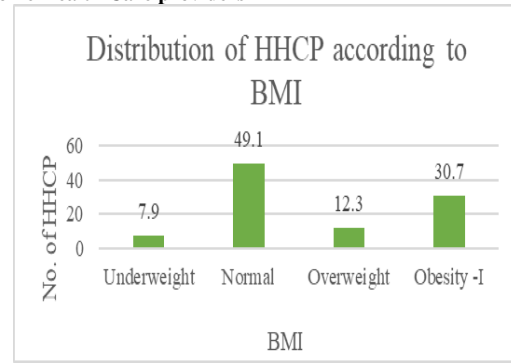
RESULT

Table 1: Distribution of Age, Height, Weight, Body Mass Index by gender in Home Health Care providers-

Variable	Gender	N	Mean	SD
Age (years)	Female	76	28.368	6.009
	Male	38	29.76	6.27
Height (cm)	Female	76	158.04	6.35
	Male	38	169.82	6.38
Weight (kgs)	Female	76	57.17	10.41
	Male	38	69.29	9.72
BMI (kg/m ²)	Female	76	22.829	3.845
	Male	38	23.900	2.852

INFERENCE: The study shows that the mean age of females was 28.36 years, and of males was 29.76 years. The mean height of females was 158.04 cm and of males was 169.82 cm. In terms of weight, the mean weight of females was 57.17 kgs and males was 69.29 kgs. The mean Body Mass Index of females was 22.829 kg/m² and males was 23.900 kg/m².

Chart 1: Distribution of Body Mass Index (BMI) amongst Home Health Care providers



INFERENCE: The Body Mass Index (BMI) of 114 participants shows that 49.1% individuals had normal BMI (18.5-22.9 kg/m²), 30.7% individuals had obesity - I BMI (≥ 25 kg/m²), 12.3% had overweight BMI (23.0- 24.9 kg/m²), 7.9% individuals had underweight BMI (<18.5 kg/m²)

Table 2: Distribution of years of experience and daily working hours of Home Health Care Providers

Variable	N	Mean	SD
Years of experience	114	6.241	4.442
Hours of work daily	114	15.921	3.852

INFERENCE: Out of 114 participants, the mean years of experience was 6.2 years and the mean of daily working hours was 16 hours.

Table 3: Distribution of Major tasks involved in Home Health Care Providers

Major tasks	Count
Transfers	83
Bathing Patient	16
Dressing Patient	14
Emptying urine bag	8
Feeding patient	14
Patient Ambulation	4
Changing Bedsheets	7

INFERENCE: In the major task distribution, 83 were involved in patient transfers, 16 were involved in bathing patient, 14 were involved in dressing patient, 8 were involved in emptying urine bag, 14 were involved in feeding patient, 4 were involved in patient ambulation and 7 were involved in changing bedsheets.

Table 4: Prevalence of musculoskeletal pain in Home Health Care Providers.

Any musculoskeletal pain at present	Count	Percent
No	30	26.32
Yes	84	73.68
N	114	100

INFERENCE: Out of 114 participants, 73.68% reported presence of musculoskeletal pain, while 26.32% reported absence of musculoskeletal pain at the time of evaluation.

Table 5: Distribution of location of pain in Home Health Care Providers.

Location of pain	Count	Percent
Neck	17	20.2
Shoulders	16	19.0
Wrist	1	1.2
Back	38	46
Knees	11	13.1
Foot	1	1.2
Total	84	100.0

INFERENCE: Majority of 46% of the population had back pain, followed by Neck pain in 20%. 19% of the individuals had Shoulder pain, 13% had knee pain and only 1 % experienced wrist and foot pain.

Table 6: Pain on Numeric Pain Rating Scale (NPRS) during activity in Home Health Care Providers

Pain on activity	Count	Percent
Mild	16	19
Moderate	50	60
Severe	18	21
Total	84	100

INFERENCE: Out of 84 participants who reported musculoskeletal pain, 60% had moderate pain on activity, while 21% had severe pain and 19% had mild pain on activity.

Table 7: Pain on Numeric Pain Rating Scale (NPRS) at rest in Home Health Care Providers

Pain at rest	Count	Percent
None	61	36
Mild	19	11
Moderate	3	2
Severe	1	1
Total	84	50

INFERENCE: Out of 84 participants, who reported musculoskeletal pain, 36% of them had no pain at rest, 11% had mild pain, 2% had moderate pain and only 1% had severe pain at rest.

Table 8: Distribution of Tasks performed with mean Rapid Entire Body Assessment (REBA) Score

Task Name	Count	Mean REBA Score
Transfers	83	8.53
Bathing Patient	16	5.06
Dressing Patient	14	5.36
Emptying urine bag	8	6.25
Feeding patient	14	5.07
Patient Ambulation	4	3
Changing Bedsheets	7	6

INFERENCE: The study of 114 participants shows that in the task category of transfers, the mean REBA Score of transfers is 8.53 performed by 83 participants. The task of bathing patient performed by 16 participants had a mean REBA Score of 5.06, 14 participants who performed the task of dressing patient had a mean REBA Score of 5.36, The mean REBA Score of emptying urine bag was 6.25 performed by 8 participants, the task of feeding patient performed by 14 participants had a mean REBA Score of 5.07. Patient ambulation performed by 4 participants had a mean REBA Score of 3. The task of changing bedsheets had a mean REBA score of 6 performed by 7 participants.

DISCUSSION

This study was conducted to assess pain and risk of work-related musculoskeletal disorders in home health care providers of Pune City. The study included participants in the age group of 20-40 with minimum age 20 and maximum age 40. As the majority of life-shaping decisions are made between the years of 18 and 40, this age group was preferable for the study. Early adulthood is described as the most stressful life stage as individuals must learn to live independently on modest financial resources and limited “real world” experience without the interference of parents and other adults who protected them in their upbringing. Although Day’s (2015) literature review focuses on younger caregivers (ages 18 to 25) it cited that caregiving can give caregivers a sense of security and enable caregivers to feel like they are taking an active role in creating positive outcomes for the care-recipient.^[8] Considering gender distribution, 76 individuals were female

while 38 individuals were male. Male caregivers are more likely than female caregivers to report providing care to individuals with physical health problems. Female caregivers are seen in majority as female caregivers are more likely to report caring for individuals with both physical and mental health problems.^[9] Caregiving activities does have an effect on the Body Mass Index as seen in a study conducted by Hajek et al which shows that the Body Mass Index increases with caregiving time and performing nursing care, whereas it was not associated with the other caregiving activities such as helping in housework; taking care of someone; providing any other extra help).^[10]

The average years of experience of the Home Health Care Providers in our study is 6.2 years. This finding is supported by a study conducted by Mercedes Guilabert et al called “The Measure of the Family Caregivers Experience” which uses The Caregiver Experience Instrument Scale stating the fact that the average years of experience of the caregiver is 6.8 years.^[11] The average working hours on a daily basis of the Home Health Care Providers are 16 hours. In a study conducted by Rubin RM, it says that caregiving hours are significantly higher when the care recipients and care givers lived together, and also for female caregivers. Employed or married caregivers provided fewer hours of care to the patients. If a secondary caregiver was available or the care recipient had mental health challenges, then caregiving hours of those primary caregiver were lower; but caregiving hours were higher when the care recipient had more Activities of Daily Living (ADLs) or Instrumental Activities of Daily Living (IADLs).^[12] The major tasks in which home health care providers are involved are transfers and patient grooming. A study conducted on the range of health related tasks performed in the home by paid caregivers states that the paid caregivers perform functional tasks such as bathing the patient, helping with cooking, and providing reminders to take medications.^[13] Along

with these the other patient care tasks which are performed are – moving around inside the house, eating, get in or out of bed, dressing, giving injection or medicine, bathing, toileting, providing bed pan, emptying urine bag.^[12]

Considering Pain evaluation, the home health care providers experienced musculoskeletal pain at present. The distribution of pain locations states that majority of pain was seen in the back region. The Numeric Pain Rating Scale (NPRS) interprets that the average pain scoring of the participants for pain on activity was moderate pain (4-6) while the average pain scoring of the participants at rest was none pain (0). A similar study conducted by Md. Majidur Rahman on caregivers experience of low back pain dealing people with spinal cord injuries states that according to Numeric Pain Rating Scale (NPRS), pain at right now was 3(30%), usual level of pain was 5(36%), best level of pain was 2(48%) and worst level of pain was 7(28%).^[14] A similar study conducted by Farzana Akter on Characteristics of pain among stroke patients and their caregivers states that among 110 participants, 1(.9%) participants had knee pain, 2 (1.8%) participants had neck pain, 2 (1.8%) participants had back pain at rest, whereas 105 (95.5%) participants had no pain at rest.^[15] Back pain is one of the major reasons for leaves taken due to Musculoskeletal condition. A study conducted by Petersen J, Kirkeskov L et al states that Low Back Pain (LBP) is probably one of the most commonly reported work-related illness. Self-reported workload exposures have been associated with Low Back Pain (LBP) in majority of studies, despite of the fact that self-reported workload exposures may serve as a validity problem as individuals with musculoskeletal complaints do more work than the required demands. Lifting over 20 kg several times a day was associated with reported sick leave caused due to LBP. The results confirmed the hypothesis that reported sick leave due to LBP in the previous year was associated

with very physically demanding work and high (Fear Avoidance Behaviors) FAB and to a lesser extent due to specific types of physical workloads.^[16]

As the study findings suggest that 30.7% individuals had obesity-I BMI (≥ 25 kg/m²), obesity is inter-related with low back pain. Studies have suggested that obesity causes an increase in anterior pelvic tilt while maintaining a normal lumbar lordosis under static working conditions. Spinal posture and function play a vital role in low back pain. The increased anterior pelvic tilt induces a greater flexion of the sacroiliac joints, and therefore a higher torque is generated on the L5-S1 joint and discs. This possibly increases the shear forces L5-S1 level and overloads the disc, thus increasing the risk of disk degeneration. In line with Gilleard, an increased lumbar lordosis was observed in obese patients with chronic low back pain.^[17]

In this study, the mean average REBA score of transfers of patients was 8.53. For patient grooming activities, the mean average REBA score was 4.95. According to the interpretation of REBA score, the scores from 4-7 indicates medium risk. The scores ranging from 8-10 indicates high risk. As the task of patient grooming indicates medium risk, further investigation in the working posture should be made and it should be changed soon. The tasks of transfers of patient indicates high risk, the working posture should be investigated and change should be implemented. A similar study conducted on ergonomic risk assessment of working postures of nurses by Ayvaz et al compared the REBA average of the reference template, it is understood that it is in the range of (4-7). It is seen that the risk is at medium level and it is necessary to make changes as a precaution.^[7]

The study shows that home health providers have major musculoskeletal complaints in the back region, with patient transfers being the activity at high risk of musculoskeletal disorders. The home health care providers are having musculoskeletal complaints in the back region due to improper working

posture and improper transfer technique. A biomechanical analysis of transfers of patients by Sheryl Ulin et al states that lifting and transferring patients have been perceived by nursing professionals to be the most frequent precipitating factors or cause of back problems. Several researchers have already documented the hazards of patient transfers. Specifically, Owen reported that 89% of the back injury reports that were filed by hospital nursing personnel indicated a patient handling task as a precipitating factor. In addition, Jensen found out that more than 73% of the back strain/sprain cases were linked to patient handling tasks. The average compressive forces at the L5/S1 disc exceeded the (National Institute for Occupational Safety and Health) NIOSH limits when transfers were performed with the manual methods.^[18] A study conducted on manual handling activities and risk of low back pain in nurses by Julia Smedley et al confirms that low back pain is highly prevalent among nurses and is associated with a high level of sickness absence. Significant associations were found with frequency of tasks like moving patients around on the bed, transferring patients between bed and chair, and lifting patients from the floor.^[19]

The limitations of the study are - Larger sample size should have been taken, RULA (Rapid Upper Limb Assessment) Scale also should've been used in conjunction with REBA (Rapid Entire Body Assessment) Scale, Comparable group of different educational qualification should've been selected to study the difference in working postures of the home health care providers as only home health care providers with an educational qualification of General Duty Assistant (GDA) were recruited, as both male and females were recruited, a comparable study of males and females could've been conducted to study the risk of musculoskeletal disorders in the specific gender. This study can be carried out in general duty assistants working in hospitals versus working at home.

CONCLUSION

The study concluded that the home health providers of Pune City had moderate pain on activity with majority of home health care providers having musculoskeletal complaints of the back region, followed with neck and shoulder regions.

The Home Health Care Providers are majorly involved in patient transfers activity, followed by patient grooming activities and are at medium to high risk to acquire musculoskeletal disorders.

As this study identifies the risk component in the home health care providers, it provides a base for awareness and knowledge of working postures, proper lifting technique, use of assistive devices for transfers of patients as well as interventions for ergonomics, correct body mechanics, workplace modification.

Declaration by Authors

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REFERENCES

1. Gershon RR, Pogorzelska M, Qureshi KA, et al Home health care patients and safety hazards in the home: preliminary findings. *Advances in patient safety: New directions and alternative approaches (Vol. 1: Assessment)*. 2008 Aug.
2. Diniz MA, Melo BR, Neri KH, et al Comparative study between formal and informal caregivers of older adults. *Ciencia & saude coletiva*. 2018;23:3789-98.
3. Sefcik JS, Boltz M, Dellapina M, et al Are Interventions for Formal Caregivers Effective for Improving Dementia Care? A Systematic Review of Systematic Reviews. *Innovation in Aging*. 2022 Feb 1;6(2):igac005.
4. Sharma K, Ahwal S, Ponnappan K, et al Simulation Based Training on Compression only Life Support in Terms of Knowledge and Skill among General Duty Assistants.
5. Toraman AU, Ardahan M, Balyacı ÖE. The effect of the body mechanic behaviors on the low back pain. *Nursing Practice Today*. 2014;1(2):107-15.
6. Yasobant S, Rajkumar P. Health of the healthcare professionals: A risk assessment study on work-related musculoskeletal disorders in a tertiary hospital, Chennai, India. *International Journal of Medicine and Public Health*. 2015;5(2).
7. Ayvaz Ö, Özyıldırım BA, İşsever H, et al Ergonomic risk assessment of working postures of nurses working in a medical faculty hospital with REBA and RULA methods. *Science Progress*. 2023 Oct;106(4):00368504231216540.
8. King McLaughlin J, Greenfield JC, Hasche L, et al Young adult caregiver strain and benefits. *Social Work Research*. 2019 Nov 27;43(4):269-78.
9. Penning MJ, Wu Z. Caregiver stress and mental health: Impact of caregiving relationship and gender. *The gerontologist*. 2016 Dec 1;56(6):1102-13.
10. Hajek A, Bock JO, König HH. Association of informal caregiving with body mass index and frequency of sporting activities: evidence of a population-based study in Germany. *BMC Public Health*. 2017 Dec;17:1-0.
11. Guilabert M, Amil P, González-Mestre A, et al The measure of the family caregivers' experience. *International journal of environmental research and public health*. 2018 Sep;15(9):2040.
12. Rubin RM, White-Means SI. Informal caregiving: Dilemmas of sandwiched caregivers. *Journal of Family and Economic Issues*. 2009 Sep;30:252-67.
13. Reckrey JM, Tsui EK, Morrison RS, et al Beyond functional support: the range of health-related tasks performed in the home by paid caregivers in New York. *Health affairs*. 2019 Jun 1;38(6):927-33.
14. Rahman M. Caregivers experience of low back pain dealing people with spinal cord injuries (Doctoral dissertation, Bangladesh Health Professions Institute, Faculty of Medicine, the University of Dhaka, Bangladesh.).
15. Akter F. Characteristics of pain among stroke patients and their caregivers (Doctoral dissertation, Bangladesh Health Professions Institute, Faculty of Medicine, the University of Dhaka, Bangladesh.).

16. Petersen J, Kirkeskov L, Hansen BB, et al Physical demand at work and sick leave due to low back pain: a cross-sectional study. *BMJ open*. 2019 May 1;9(5):e026917.
17. Vismara L, Menegoni F, Zaina F, et al Effect of obesity and low back pain on spinal mobility: a cross sectional study in women. *Journal of neuroengineering and rehabilitation*. 2010 Dec;7:1-8.
18. Ulin SS, Chaffin DB, Patellos CL, et al A biomechanical analysis of methods used for transferring totally dependent patients. *Sci Nurs*. 1997 Mar 1;14(1):19-27
19. Smedley J, Egger P, Cooper C, et al Manual handling activities and risk of low back pain in nurses. *Occupational and environmental medicine*. 1995 Mar 1;52(3):160-3.

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