ijlpr 2020; doi 10.22376/ijpbs/lpr.2020.10.4.L21-28

International Journal of Lifescience and Pharma Research

Research Article

Physiotherapy for Better Pain Management

Prevalence Of Work Related Musculoskeletal And Psychological Problems Among Female Bus Conductors In Karad.

Apurva Girish Mehta, Dr. Smita Chandrakant Patil, Dr. Chandrakant Babaso Patil, and Dr. Khushboo Trishant Chotai

**Miss Apurva G. Mehta, Final Year, faculty of physiotherapy, Krishna institute of medical sciences deemed to be university, Karad, Maharashtra, India.*
**Dr. Smita Patil, Assistant professor, department of musculoskeletal sciences, faculty of physiotherapy, Krishna institute of medical sciences deemed to be university, Karad, Maharashtra, India.*
**Dr. Chandrakant Patil, Assistant professor, department of cardiopulmonary sciences, faculty of physiotherapy, Krishna institute of medical sciences deemed to be university, Karad, Maharashtra, India.*
**Dr. Khushboo Chotai, Assistant professor, department of sports sciences, faculty of physiotherapy, Krishna institute of medical sciences deemed to be university, Karad, Maharashtra, India.*

Abstract: Work related musculoskeletal problems and its impacts are present worldwide and currently musculoskeletal problem is mostly affected by transportation services mostly buses. In buses, among conductors and bus drivers most affected are the lady conductors. There are about 33% reserved for the female bus conductors job. Due to this reservation, there are many females working in MSRTC (Maharashtra State Road Transport Corporation). They have to work minimum 8-10 hours per day with less period of rest. Therefore, they have to face many musculoskeletal and psychological problems due to their work schedule which begins from early morning to late night. Our objective is to study the prevalence of work related musculoskeletal and psychological problems among female bus conductors in Karad. Study was conducted using a sample size of 48 female bus conductors for a period of 6 months. The inclusion criteria was female bus conductors who were having more than 5 years of working experience and exclusion criteria was the subjects with musculoskeletal problems detected prior to joining their recruited duties and subjects who were not willing to participateWe found that most of the females are suffering from discomfort in lower back 88% followed by head and neck 56%, Psychologically, 60% from mild depression, 44% from stress and 40% from moderate anxiety suffered. From this study, it can be concluded that these female bus conductors suffer from work related musculoskeletal such as discomfort in major body parts and psychological problems such as depression, anxiety and stress.

Keywords: female conductors, musculoskeletal problems, psychological problems.

***Corresponding Author**

Dr. Smita C. Patil, , Assistant professor, department of musculoskeletal sciences, faculty of physiotherapy, Krishna institute of medical sciences deemed to be university, Karad, Maharashtra, India.

Recieved On 25 January 2020
Revised On 25 February 2020
Accepted On 14 May 2020
Published On 05 October 2020

Funding This research did not receive any specific grant from any funding agencies in the public, commercial or not for profit sectors.

Citation Apurva Girish Mehta, Dr. Smita Chandrakant Patil, Dr. Chandrakant Babaso Patil, and Dr. Khushboo Trishant Chotai , Prevalence Of Work Related Musculoskeletal And Psychological Problems Among Female Bus Conductors In Karad..(2020).Int. J. Life Sci. Pharma Res.10(4), L21-28 http://dx.doi.org/10.22376/ijpbs/lpr.2020.10.4.L21-28

1. INTRODUCTION

Work related musculoskeletal problems and their impact is present everywhere. It results in severe long term pain and physical disability and affects 100 millions of people all over the world. In such cases, the affected people's psychological status and their behavior towards families as well as their career is disturbed. Even though musculoskeletal conditions are different in their pathophysiology, they are also related anatomically and at site of pain and physical dysfunction[1]. Currently musculoskeletal problem are mostly affected by transportation services. There are many services like buses, trains, trams, airplanes, boats/ferries, cars, horses, bicycles, motorbikes, trucks, vans and walking for transportation. Among these, buses are mostly preferred by all categories of passengers which indicates buses are widely used for transportation.[2] There are 33% seats reserved for the female bus conductors. Due to this reservation, there are many females working in MSRTC.[3] They have to face many musculoskeletal problems and psychological problems due to their work schedule which begins from early morning to late night. [4] From literature search, many work related musculoskeletal problems are seen in bus conductors.[5] These problem include pain, fatigue, numbness and tingling in lower limb and feeling of discomfort in upper limb. Pain is caused due to long standing or sitting in the same position for a prolonged period of time. Pain exist not only present in the lower limb but also in the trunk and upper limb. Work related musculoskeletal problems are mostly seen in those who operate large vehicles. Fatigue will also present all over the body due to work related stresses. Tingling sensation is also experienced because of long standing or long sitting otherwise numbness is also present.[6,7,8] Vibration is the most important cause of low back pain. [4] Also there are many risk factors which aggravate these symptoms including age, gender, weight, height, BMI as well as the health status of bus conductors. [8] Not only musculoskeletal problems , but also psychological problems are also been faced by female bus conductors and this include stress, anxiety, depression and workplace pressure. Level of stress will increase due to passengers' behavior in such a way that sometimes they have to listen to abusing words from passengers and while performing multiple tasks at the same time, like selling tickets, speaks loudly to inform the passengers once their destination is arrived and also while passing information to the driver while transit through narrow roads and junctions. Due to the above mentioned musculoskeletal problems and stresses as well as prolonged working hours in awkward standing posture, excessive workload, minimum rest between trips, lack of sleep and insufficient time spent with family can lead to an increase in depression levels. [4] Bus conductors also come across with work place violence, such as assault, rape, sexual harassment and robbery[9]. There is very limited literature which has explored the various occupation related hazards and associated co-morbidities specific to the female bus-conductors. Uneven hours of shifts lead to sleep deprivation which also increases the risk of various psychological issues in the female bus conductors. This study aims to find out the various musculoskeletal and psychological problems in female bus-conductors. As the majority of the duty-hour involve sedentary work, the correlation between BMI and musculoskeletal factors can help to establish a better picture of the preventive measures which could be possibly taken to reduce the associated risk factors.

2. METHODS

An analytical type of observational study was carried out using a cross sectional study design.The study is conducted in Karad situated in Maharashtra, in India. After approval of this study from institutional ethical committee (KIMSDU/IEC/02/2019) with approval number 0473/2018-2019 ,we selected this area because locality of female bus conductors is more in this area. Subjects were selected as per the inclusion and exclusion criteria.

2.1 Inclusion criteria

Inclusion criteria contains female bus conductors aged between 30-55 years, subjects who were having more than 5 years of experience and subjects working for minimum 16 hrs.

2.2 Exclusion criteria

Exclusion criteria contains subjects with musculoskeletal problems detected prior to joining their recruited duties, subjects who were not willing to participate and subjects with previous surgical history/systemic illness. Consent of the subject was taken. Procedure were explained to them in detail. The questionnaire submitted among the subjects and they were asked to read the questions and tick the appropriate answer. If the subject was not able to read questionnaires on their own, the therapist read the questions and the options and asked for the appropriate answerQuestions were related to negative emotional states of depression, anxiety and stress as well as related to pain. Information collected was documented properly in the data collection sheet. Total score of DASS21[10], VAS[11] and Body Part Discomfort scale[12] were calculated. This DASS21 scale (Depression Anxiety Stress Scales) is used for depression, anxiety and stress. It has number of advantages over older DASS. It is shorter and more acceptable for clients with limited concentration. VAS is mostly used for intensity of pain i.e. Visual Analogue Scale. And body part discomfort scale is used to measure the discomfortness of each part of body.

3. STATISTICAL ANALYSIS

Statistical analysis of the recorded data was done by using the software SPSS version20. Statistical analysis was done using statistic software . Unpaired t test was used to analyse the datas . The data were presented as mean ± standard deviation. Probability value of less than 0.05 was considred statistically significant.

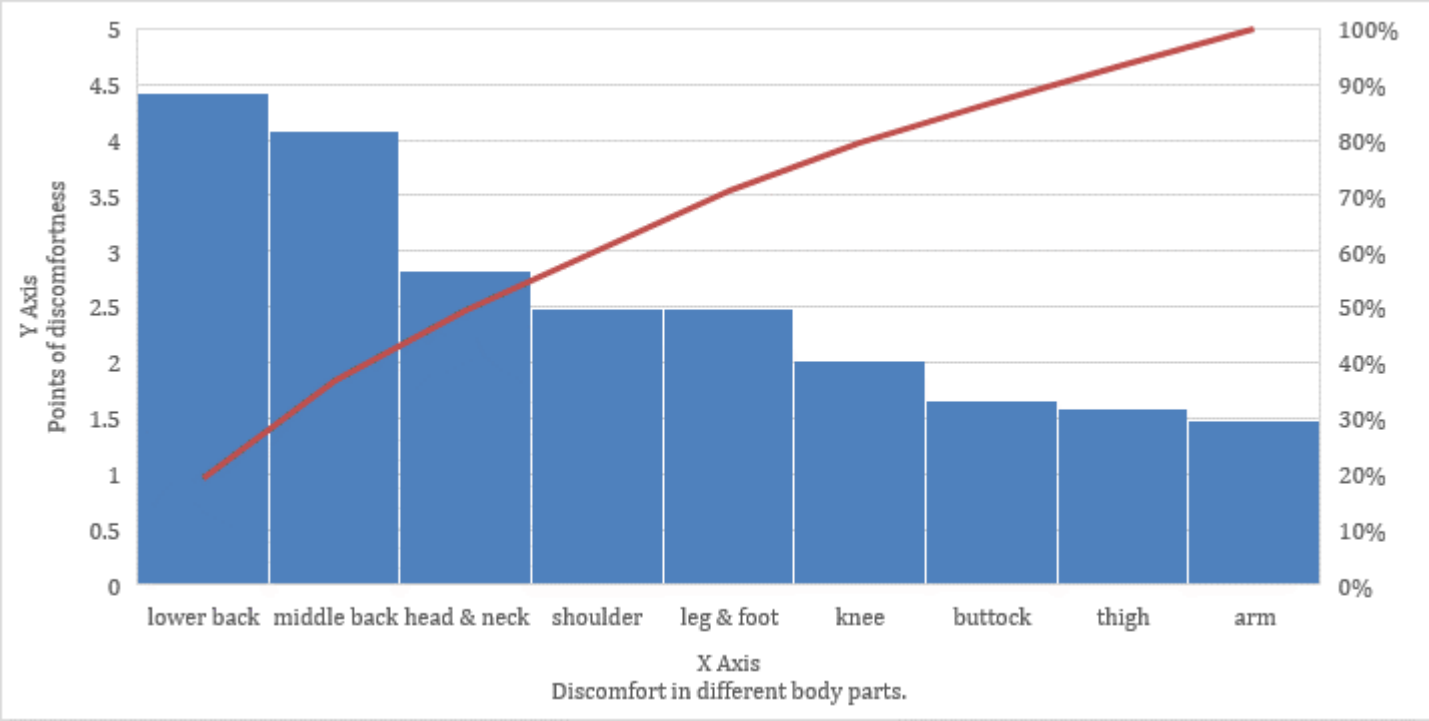
4. RESULTS

48 subjects were successfully completed the given questionnaires. The result showed that the mean age of female's bus conductor was 36.38 years and SD was 4.003. The mean values of BMI (SD) were 23.56 kg/m^2 (2.631) [Table 1].

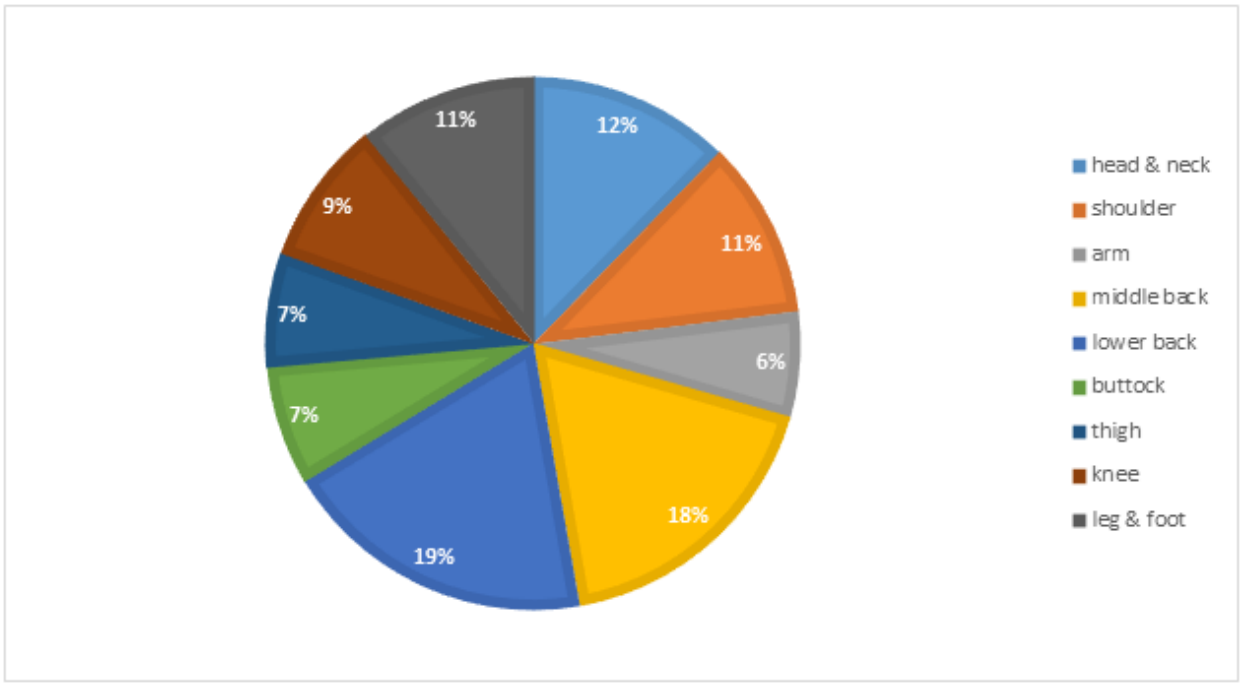
Table 1. Physical characteristics of female bus conductors.				
	Mean ± SD	T value	P value	Interference
Age (years}	36.375±4.003	62.951	<0.0001	Extremely significant
BMI	23.556±2.631	62.032	<0.0001	Extremely significant

Table 2. Discomfort (pain) among conductors affecting different body parts	
Body part discomfort	Mean ± SD
Head and Neck	2.833±0.9070
Shoulder	2.479±0.9891
Arm	1.479±0.6838
Middle Back	4.083±0.9187
Lower Back	4.417±0.8711
Buttock	1.667±0.9749
Thigh	1.583±0.7672
Knee	2.021±0.7852
Leg and Foot	2.479±0.7716

Graph1(Discomfort (pain) among conductors affecting different body part) shows that most female bus conductors are suffering from discomfort mainly in the back region. They also experienced discomfort in the head and neck region than the other body parts. From this graph, females experienced more discomfort in the back region followed by head and neck than the other body parts.



Graph 1. Discomfort (pain) among conductors affecting different body part

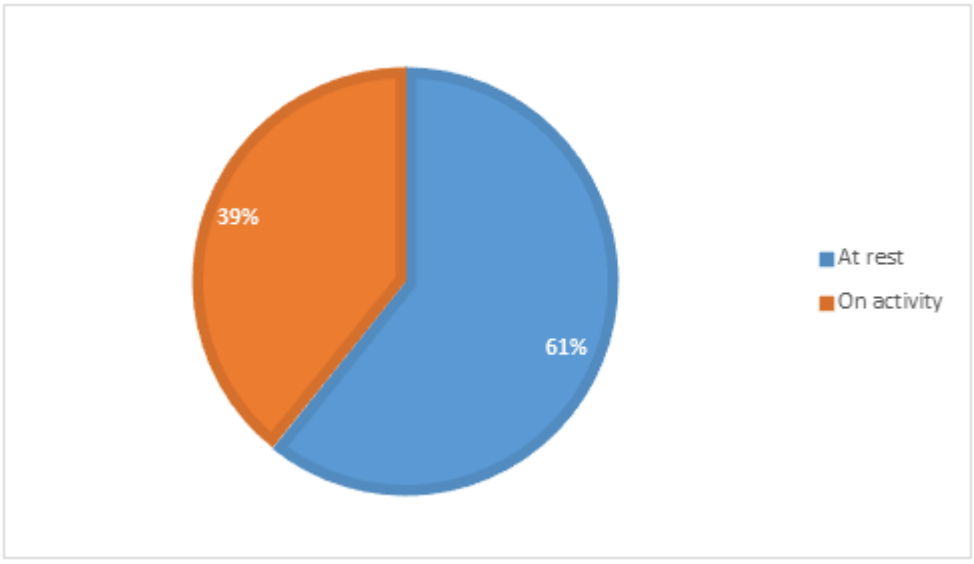


Graph 2. Percentage of discomfort among females in different body parts

Graph 2 (percentage of discomfort among females in different body parts) shows that percentage of discomfort among females in different body parts. In that it shows that out of 100% females 19% females suffering from lower back, 18% from middle back, 12% from head and neck, 11% from leg and foot, 11% from shoulder, 9% from knee, 7% from thigh, &% from buttock and remaining 6% from arm discomfort

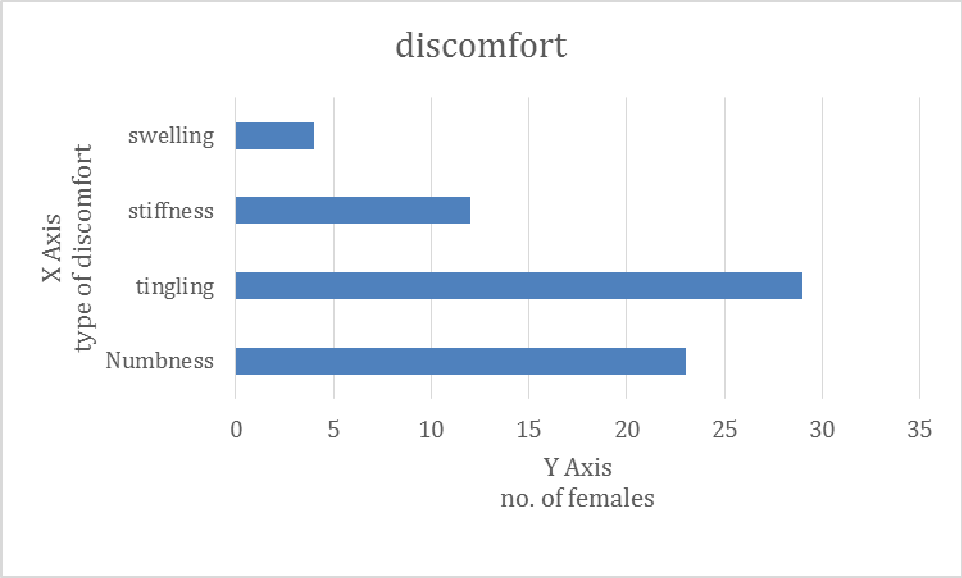
Table 3. VAS for pain

	Mean ± SD	T value	P value
At Rest	8.031±1.206	10.079	
On activity	5.190±1.536		<0.0001

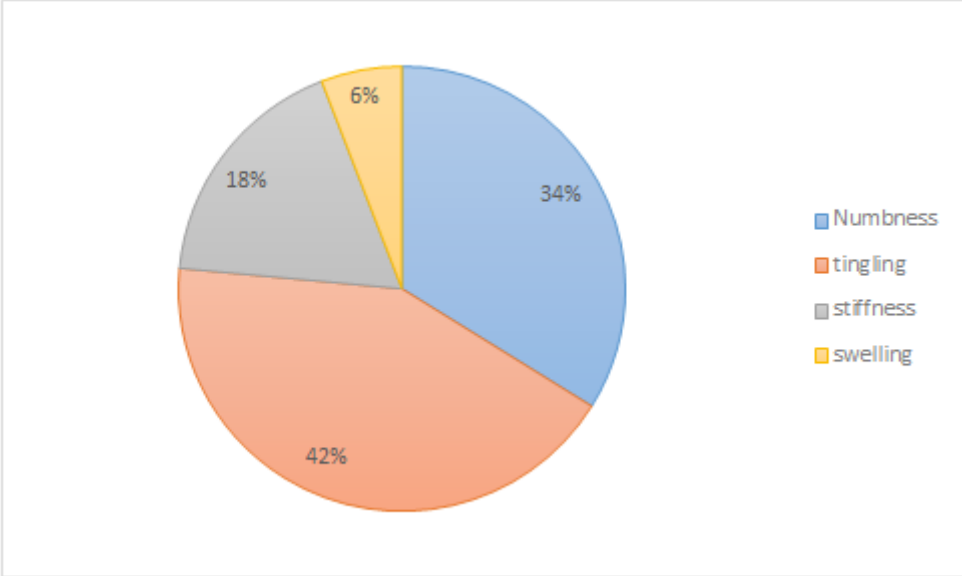


Graph 3. Percentage of females who are suffering from the pain while working and at rest

Table 3 and graph 3 shows that pain at rest and on activity. The subjects reported more discomfort at rest than on activity. In this study females suffered from severe pain at rest which is almost 61% females and 39% females have pain on activity i.e. at work.



Graph 4. Type of discomfort among female bus conductors



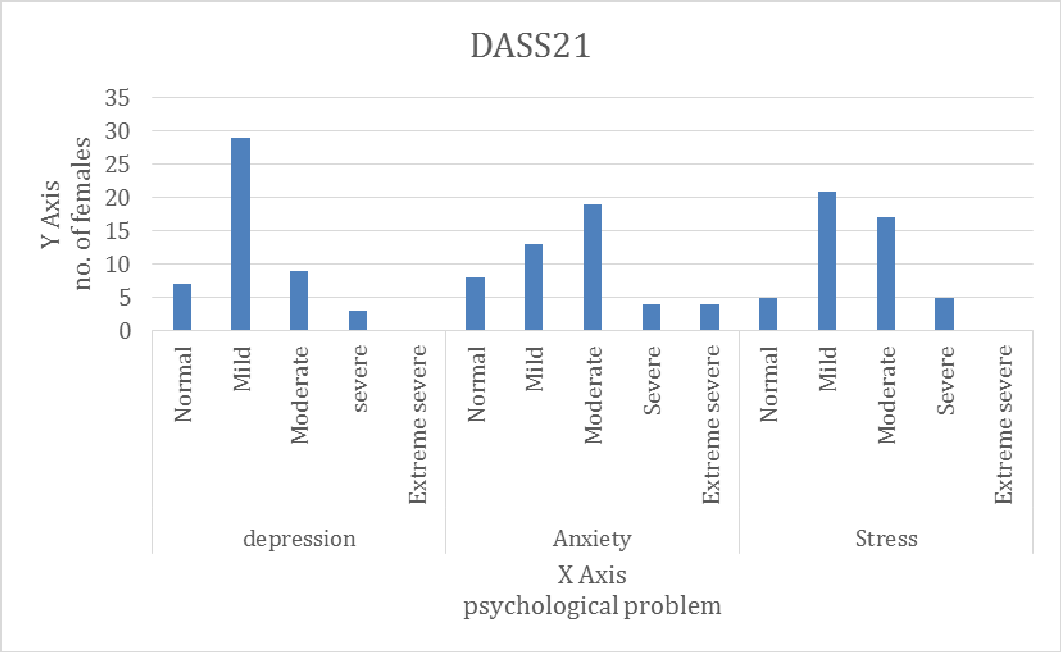
Graph 5. percentage of females who are suffering from other types of discomfort

Graph 4 shows that level of discomfort in different body parts and Graph 5 shows that predominant type of discomfort. In that due to prolonged standing they experienced tingling and numbness in the leg region. Some of the bus conductor's complaints of swelling and stiffness in the leg region. Out of 100% female bus conductors 34% experienced numbness, 42% experienced tingling, 18% females experienced stiffness and 6% experienced swelling.

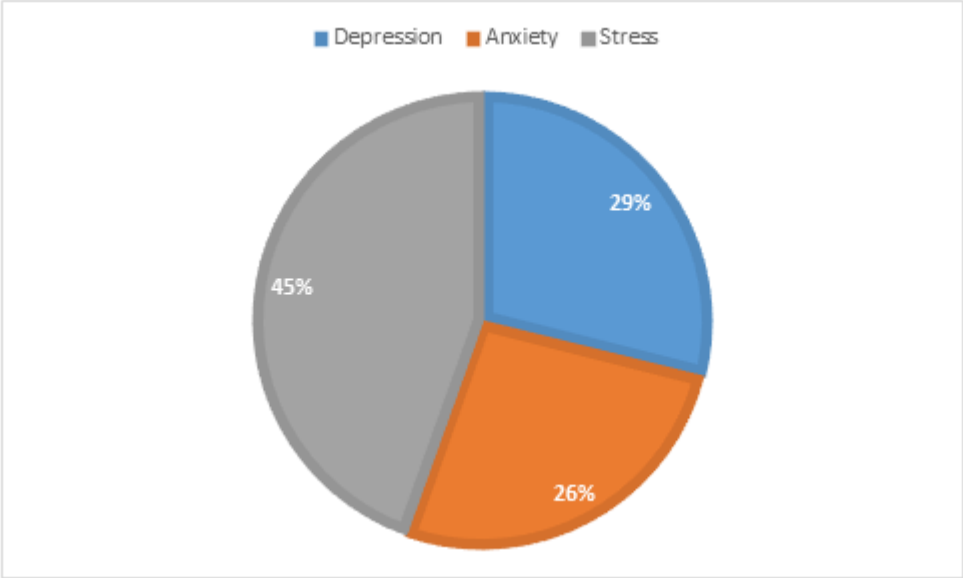
For psychological problem

Table 4. DASS 21 scale

DASS 21	Mean	SD	F Value
Depression	12.542	4.472	
Anxiety	11.479	4.434	1.017
Stress	19.333	5.451	



Graph 6: DASS21



Graph 7. Percentage of DASS 21 scale

The questionnaire study showed that females are also suffering from depression anxiety and stress. According to this study 29% female suffering from depression, 26% from anxiety and remaining 45% from stress. This shows that more females are suffering from stress

5. DISCUSSION

This research aimed to study the work related musculoskeletal as well as psychological problems among female bus conductors. Evidence suggests that because of prolonged standing and abnormal postures causes discomfort in all body parts and because of these further leads to work related stress. Due to this , they have to face many musculoskeletal problems like pain, discomfort in all body parts, tingling, numbness, swelling and stiffness and psychological problems like depression, anxiety and stress.This study was done for 6 months of duration with sample size 48 and who has more than 5 years of experience and more important is who doesn't have any musculoskeletal deformity or syndrome present before joining recruited duties and the same for psychological problems. The symptoms associated with musculoskeletal disorders vary from individual to individual and can can cause symptoms such as pain, numbness, tingling as well as reduced worked productivity, lost time from work and temporary or permanent disability, Graph 1 shows discomfort in different body parts. Most of the females feel discomfort more in the lower back (88%). They experience more in the middle back (82%) and head and neck (56%) also. Followed by discomfort in the other region like shoulder (49%), arm (29%), buttock (34%), thigh (32%), knee (40%) and in leg and foot (49%). Graph 2 shows that percentage of discomfort in different body parts. It shows that how many females are suffering from that discomfort i.e. 12% from head and neck, 11% from shoulder, 6% from arm, 18% from middle back, 19% from lower back,7% from buttock, 7% from thigh, 9% from knee and 11% from leg and foot. Due to discomfort, pain

aggravates and from those graph it shows that at rest i.e. in non-working hours they have more pain than in working hours. And 61% females suffering from pain at rest and 39% on activity. And other types of discomfort like tingling (34%), tingling (42%), stiffness (18%) and swelling (6%).According to the above results it is observed that there is presence of discomfort, pain and types of discomfort. Psychological problems, includes stress, anxiety, depression and workplace stresses. The result of the study showed that the majority of bus conductors don't have sufficient time to spend time with their family because of their hectic job schedule that directly affects their psycho-social behavior which leads to stress. Even the majority of bus conductors don't get enough sleep from their busy schedule further resulting in more stress.[5] Psychological factors such as 1) Job satisfaction 2) Intensified workload 3) Monotonous work 4) Job control 5) Social support were potentially related to work involving musculoskeletal disorders were described by NIOSH in 1997.[4]According to our study, 44% of bus conductors were suffering from mild stress, 35% from moderate, 10% severe and 11% were normal. From anxiety 27% are suffering from mild, 40% from moderate, 8% severe, 8% extreme severe and 17% were normal. On the other hand, from depression, 60% were suffering from mild, 19% moderate,6% severe and 15 % were normal. For head and neck, as it is because of frequent turning of head neck left or right side while boarding passengers pain occurs. The psycho social factors of job dissatisfaction, low supervisor support, high psychological demands and frequency of specific job problems are predictive of back and neck pain. Sometimes, back and neck problems are due to abnormal sitting and standing posture. As they have to stand for prolonged period with slight neck flexion and this further lead to pain and discomfortness.[4] For shoulder and arm, as it is due to repetitive action of the shoulder to ring the bell at each and every station they had to stretch their shoulder which brings pressure on the shoulder leading to pain. Such continual posture leads to muscle shortening, which in turns results pain in the shoulder.[4] For the middle and lower back, as it is due to prolonged standing which are faced by bus conductors and often they can't sit for a long period causes pain. Vibration is one of the major causes for low back pain. Because of whole body vibration, spinal degeneration results, which leads to low back pain. Most of the time because of swaying also can cause pain in the back. Swaying occurs due to potholes or bumps on the roads with minimum support as they have to collect tickets or change the money causing their both hands occupied bringing pressure on their back leads to discomfort or pain.[4] For lower limb, as they have to do many tasks such as collect tickets from each passenger gets pain.They have to get in and out from bus at each and every stop till last destination and they stand for prolonged period causes pain in knee which is the main weight bearing joint in lower limb due to which majority of bus conductors suffer from tingling and stiffness problems. The indications of stress, anxiety and depression are getting upset by trivial things, finding it difficult to relax, losing patience if delayed in any work, overreacting in situations, nothing to look forward, too sad and depressed.[4]Thus according to this study the female bus conductors also have to face work related psychological problems. Limitations - The time period is very less, with that the number of the samples are also have been restricted due to geographical area. Other factors such as psychosocial factors, posture analysis, etc. not have been investigated. Even working hrs. was not focused more which should be considered for further studies.

6. CONCLUSION

From this study, it can be concluded that these female bus conductors have to face work related musculoskeletal problems such as discomfort in major body parts, pain. Among all body parts trunk suffer more than the other body parts. Psychological problems such as depression, anxiety and stress Adds to this discomfort

7. AUTHORS CONTRIBUTION

Study conception and design was done by Apurva G. Mehta, Dr. Smita C. Patil. Acquisition of data was done by Apurva G. Mehta. Dr. Smita C. Patil and Apurva G. Mehta have done analysis and interpretation of data. Drafting of Manuscript was done by Dr. Smita C. Patil, Dr. Chandrakant B. Patil and Dr Khushboo T. Chotai. Critical revision of the manuscript was done by Dr. Smita C. Patil, Dr. Chandrakant B. Patil and Dr Khushboo T. Chotai.

8. ACKNOWLEDGEMENT

I sincerely thank the management of KIMSDU for allowing me to conduct this study by providing me the necessary requirements. I thank dean Dr. Varadharajulu for his support and guidance. My sincere thanks to guide Dr Smita Patil for helping me in my research

9. CONFLICT OF INTEREST

Conflict of interest declared none.

10. REFERENCES

1. Woolf AD, Pfleger B. Burden of major musculoskeletal conditions. Bulletin of the world health organization. 2003;81:646-56. Available from: https://www.scielosp.org/article/bwho/2003.v81n9/646-656/
2. Gangopadhyaya S, Das T, Ghoshal G, Biswas P. A questionnaire study to evaluate the predominant causes behind city bus accidents in calcutta, india. Indian Journal of Physiology and Allied Sciences. 2005;59(2):33.
3. Somashekar N, Vinodkumar GC. Occupational Problems and Challenges of Women Bus Conductors in Road Transport Industry: With Special Reference to BMTC. International Journal of Humanities and Social Science Invention. 2012 Dec:55-60.
4. Dabholkar AS, Khatib S, Dabholkar T. Psychological problems faced by Navi Mumbai bus conductors. International Journal of Community Medicine and Public Health. 2015 Apr;2(2):184. DOI: 10.5455/2394-6040.ijcmph20150523
5. Gangopadhyay S, Dev S, Das T, Ghoshal G, Ara T. An ergonomics study on the prevalence of musculoskeletal disorders among Indian bus conductors. International journal of occupational safety and ergonomics. 2012 Jan 1;18(4):521-30. DOI: 10.1080/10803548.2012.11076957

6. Magnusson ML, Pope MH, Wilder DG, Areskoug B. Are occupational drivers at an increased risk for developing musculoskeletal disorders?. Spine. 1996 Mar 15;21(6):710-7.
Available from: https://journals.lww.com/jrnldbp/00007632-199603150-00010.fulltext
7. Massaccesi M, Pagnotta A, Soccetti A, Masali M, Masiero C, Greco F. Investigation of work-related disorders in truck drivers using RULA method. Applied ergonomics. 2003 Jul 1;34(4):303-7.
DOI: 10.1016/S0003-6870(03)00052-8
8. Hulshof CT, Verbeek JH, Braam IT, Bovenzi M, Van Dijk FJ. Evaluation of an occupational health intervention programme on whole-body vibration in forklift truck drivers: a controlled trial. Occupational and environmental medicine. 2006 Jul 1;63(7):461-8.
DOI: 10.1136/oem.2005.020032
9. Couto MT, Lawoko S, Svanström L. Violence against drivers and conductors in the road passenger transport sector in Maputo, Mozambique. African Safety Promotion: A Journal of Injury and Violence Prevention. 2009;7(2):17-36.
Available from: https://www.ajol.info/index.php/asp/article/view/70414
10. Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. British journal of clinical psychology. 2005 Jun;44(2):227-39.
DOI: 10.1348/014466505X29657
11. Scott J, Huskisson EC. Graphic representation of pain. Pain. 1976 Jun 1;2(2):175-84.
DOI: 10.1016/0304-3959(76)90113-5
12. Corlett EN, Bishop RP. A technique for assessing postural discomfort. Ergonomics. 1976 Mar 1;19(2):175-82.
DOI: 10.1080/00140137608931530