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Prevalence of Low Back Pain in Security Guards in MGM Institute of Health Sciences, Aurangabad

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ABSTRACT

Introduction: The disorder results from work related event are known as "work related Musculoskeletal disorders" [WMSDs], LBP has become the most common occupational injury in many countries affects activities of daily living of the person. So the aim of our study is to find out the prevalence of low back pain among security guards as their occupation comprises of prolong standing
Materials and Methods: There were 130 security guards of MGM institute of health science Aurangabad were included in the study. Both male and female guards selected according to the inclusion criteria of having experience of more than six month of age 18 to 60years and all the guards were assessed using Oswestry Disability Index questionnaire, and subjective assessment of pain done using VAS.
Result: The result is calculated on the basis of percentage of male & female guards who are having low back pain according to Oswestry Disability Index it reveals out of 73% male 29% are affected by low back pain and among 26% of female 19% are affected by low back pain.
Conclusion: our study concludes that the prevalence of LBP among the guards is 48%. Different components ODI score among which standing, walking, travelling are mostly affected. There are 48% guards comes under middle age are more prone to low back pain because of sacroiliac joint dysfunction and facet joint pain.

Key words: security guard, ODI, LBP

INTRODUCTION

A wide range of inflammatory and degenerating condition affect muscle, tendon, joints, peripheral nerves etc. are categorized as musculoskeletal disorders [MSD].[1] It causes long term pain, fatigue and physical disability as it affects multiple joint leading to increase job restriction, increase absenteeism and transfer to another job [2]. In developing countries 50-70% of workforce is at a risk of developing musculoskeletal disorder owing to the various ergonomic risk factors present in their work place.[3]

The disorder results from work related event are known as "work related Musculoskeletal disorders" [WMSDs], where worker experience discomfort one or multiple body parts, pain in joints, tingling and swelling.[4] Aweto et al in (2015) explained High prevalence of work related musculoskeletal disorder have been recorded among worker to expose to repetitive and static work, long time standing[5]. It was notice that work related musculoskeletal disorder, stress, fatigue and some other type of psychological disorder could also trigger pain even there is no injury present[6].

Mario A. Gutierrez, et, al. has found that in musculoskeletal disorders low back pain [LBP] is second ranking reason which can be seen[7]. Low back pain is ache or pain in the lowest part of back. Lowback pain is common experience among people all over the world. The lifetime prevalence is reported to be as high as 84%, and the prevalence of low back pain seem to be almost the same among the adults[8]. Tissot et al.,(2009) stated that Low back pain is an important occupational health problem in many countries[9].

In many countries chronic low back pain is the most common cause in long term disability in middle age[10]. A high prevalence of work related musculoskeletal disorders has been recorded among the workers who are expose to manual labor work in unusual and restricted posture repetitive and static work, vibration and poor psychological and social conditions[5].

As per the researcher Manchikanti Singh et.al, (2014) found that LBP has become the most common occupational injury in many countries and one of the most common reason to see a doctor or stay in hospital or receive surgical treatment. Low back pain affects activities of daily living of the person. It should be explained that low back pain is a common condition and that fear and avoidance behavior can worsen rather than elevate the situation, resulting in reduction in activity of daily life and work ability[11].

Lee et al, (2010) explained that the Back muscles support spine and maintain stability of spine. Weakness of back muscles leads to LBP and is known as main cause of reoccurrence[5].Robinsen 2011 stated that Back pain is a pain felt in human back that come from the muscle, nerve, ones, joint and other structure of spine. The pain may constant or intermittent, stays in one place or radiate to the other. It may be dull aching or sharp piercing or burning sensation. The LBP refer to the pain in lumbosacral area from the first lumbar vertebrae to first sacral vertebrae. This area is where the lordotic curve. Most common site of low back pain is 4^{th} and 5^{th} lumbar segment by Kravitz & Andrews 2011. Low back pain usually causes in ligament or muscle holding vertebrae in its proper position is strain. Vertebrae are the bones that make up the spinal column from which spinal cord passes. Ostgaard, 1991 found that Weakness in this muscle and ligaments leads to loss of stability in spine resulting in pain. Anderson, 1984 studied that pain in the low back referring into the hip, buttocks or one leg which may cause due to muscle strain or trigger points, instability due to weak postural muscles, hypo mobile spinal facet joints or degeneration or herniation of spinal discs[12].

Working in standing provides large degree of freedom and enables worker to perform job in an easy and efficient way enhancing the productivity. But when workers spend more than 50% of total working hour in standing it exposes them to potential occupational injuries[4]. A significantly larger proportional of men and women mostly work in standing position, the prevalence of low back pain in them were higher among those who work in standing posture than who work in sitting posture[9].

Security guards spend almost their entire working hours in standing position. This puts them at higher risks of hazards of prolonged standing than any other occupation. Back pain in standing is may be due to increased perceived exertion and discomfort in low back and increased muscle fatigue from efforts required to maintain upright posture[13].

Prolonged standing leads to static contraction of muscle to maintain posture which leads to discomfort and fatigue, which is supported by Krgnenet, al. 1998[14]. VaanDieen et, al [1987] proved that prolonged low intensity load could increase the likely hood of tissue damage, due to viscoelastic time dependent behavior of biological tissue leading to pain and discomfort[15].

Risk factors for low back pain are many such as age, people with younger age

are physically more active than older one. So due to standing work the degenerative changes may occur in early age. Gender affects the LBP as physiological changes vary from male to female. Lordotic curve increases due to protruding belly in obese individual which may result into LBP so obesity is major risk factor for LBP among security guards. ‘‘Nature of work’’ like prolonged standing results into postural discomfort which may contribute to increase low back pain in guards. Smoking, alcohol, personal health status, working environment are some other factors which affects pain status in among the security guards[16].

Prevalence is defined as the degree to which something is prevalent, especially the percentage of population that is affected with a particular diesis at a given time[17]. The purpose of our study is to identify the prevalence of low back pain [LBP] among the security guards. This study will give sociodemographic information to identify working posture, working hour, severity of pain, to explore weather security guards stays away from work due to low back pain and whether they should receive treatment or not[17]. Also, this give idea about weather security guards are doing their activity with repetitive moment of the body and poor work center of the design without having ant back pain.[17]

Last few studies gives the recurrence rate of low back pain is as high as 60% to 85% and this can seriously influence a person’s quality of work and life[18]. A survey held in Haryana in year 2015 shows that security guards who had musculoskeletal disorders the majority among them is of back pain[19].

By knowing the prevalence of low back pain among the security guards of whole MGM campus will helpful to plan effective work condition and work hardening measures for them. So, their quality of life will improve and we can extent their cooperation to bring ease in their lives.

A highly structured, goal oriented, individualized intervention programmed design to return the employee to work. Work hardening programs are multidisciplinary in nature and utilize real or simulated work activities designed to restore to physical, behavioral and vocational functions. Work hardening addresses the issues of productivity, safety, physical tolerances and worker behaviors.

Work conditioning is an intensive, goal oriented conditioning program design to restore neuro muscular and musculoskeletal function including strength, power, endurance, joint mobility, and range of motion, motor control, cardiovascular endurance and functional abilities. The primary objectives of the work conditioning programs to destroy physical capacity in function to enable the injured worker to return to his or her pre-injury job.[20]

The prevalence of low back pain is not known among the profession like security guards, whose occupation comprises of prolonged standing only[19]. Many of the security guards in MGM campus comes from low socioeconomic conditions, they don’t disclose their health problem due to fear of losing their job and salary. This study will help in finding out prevalence of LBP and helps to plan the better healthy future too.

Security guard generally complains of many musculoskeletal problems which ultimately hampers their activity of daily living. In this study we want to study whether the security guards are having low back pain because of their occupation which mainly related with long term standing. By knowing prevalence of back pain, we can plan for their further evaluation, precaution and ergonomic modification which are the need of today’s lifestyle.

So the aim of the study is to know the prevalence of low back pain among security guards and the objectives of the study are to find out the percentage of security guards suffering from low back pain, to compare between male and female security guards. to analyze the different components according to Oswestry Disability Index, to find out prevalence of

low back pain according to BMI in security guards, to find out prevalence of low back pain according to working experience as security guard, to find out prevalence of low back pain according to NPRS and to find out prevalence of low back pain according to working shift.

METHODOLOGY

The study design was observational cross sectional study; total 130 samples were selected for the study from all the security guards of MGM institute of health sciences Aurangabad.

Inclusion criteria:

1. Security Guards of age 18-60 working in MGM.
2. Both male and female gender was selected.
3. Guards who were having experience of duty for more than 6 months

Exclusion criteria:

1. Any recent fracture
2. Any recent spinal injury
3. Patients with scoliosis
4. Females who are pregnant
5. Any Spinal deformities

Outcome Measure

Oswestry Low Back Disability Questionnaire

The questionnaire has been designed to give therapist information about the patients back pain and how his\her back pain has affected his\her ability to manage everyday life.

Patients just have to mark the box which most closely describes their problem.

Procedure

Subject full filing the inclusive criteria were selected, inform consent was taken, questionnaires (ODI) were given to individual and study was explained in detail, guards were asked to fill the questionnaire (Oswestry Disability Index), filled questionnaire were selected on the same day, items were analyzed for the disability due to low back pain with the help of Oswestry Disability Index.

Statistical Analysis

The collected data were entered in Microsoft excel and analyzed using SPSS version 24.00$^{th.}$ Mean and SD was calculated for quantitative variables and proportions was calculated for categorical variables. Also, data was represented in form of visual impression like bar diagram; pie diagram etc. for comparison of two groups outcome unpaired t-test was applied.

RESULT

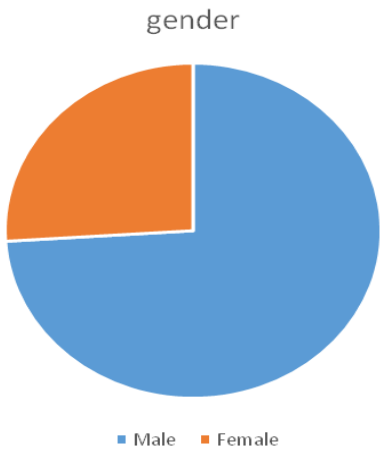
The present study was based on the finding of prevalence of low back pain among security guards. In this study we had taken 134 sample size as guards. The result was calculated on the basis of percentage of male & female guards who were having low back pain according to Oswestry disability index. The mean age of guards under our study was 29 to 38years of age including male and female.

Mean and standard deviation of age of security guards in sample size were 26.8 and 23.74 respectively. Mean of the BMI of security guards was 33.5 and the standard deviation of the BMI was 21.51.

Table no.1-Distribution of security guards according to their gender

Gender	Number	Percentage
Male	99	74%
Female	35	26%
Total	134	100%

Above table shows distribution of participants according to their gender, there was total 134 participants among which 74% are male and 26% are female.

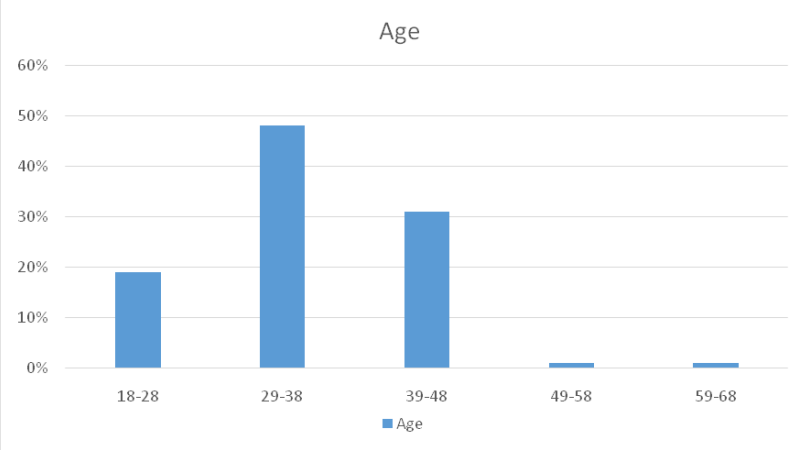


Graph 1: distribution of security guards according to gender. Percentage of male was more than female.

Table no.2-Distribution of security guards according to their age.

Age	Number	Percentage
18-28	25	19%
29-38	64	48%
39-48	41	31%
49-58	2	1%
59-68	2	1%
Total	134	100%

Above table shows the distribution of security guards according to their Age in which 19% of guards comes under 18 to 28 years, 48% comes under 29 to 38 years, 31% comes under 39 to 48 years and 1% comes under 49 to 58years and 59 to 68 years also.

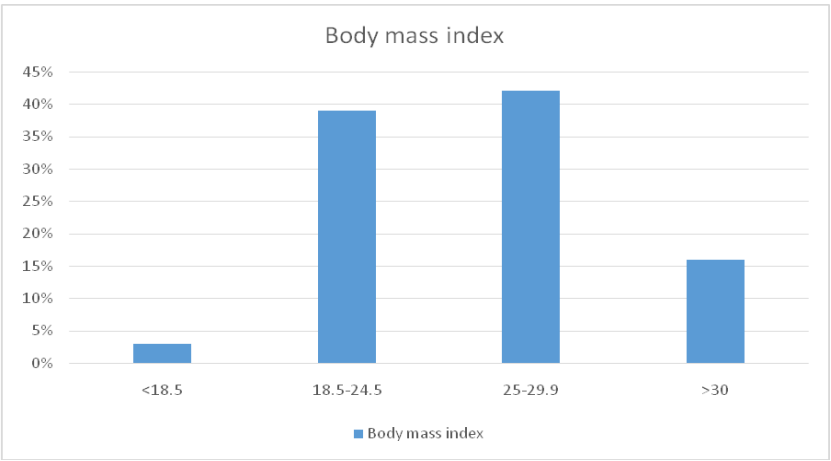


Graph 2: distribution of guards according to age. Maximum in age group 29 to 38 and minimum in 49 to 68.

Table no.3-distribution of security guards according to their body mass index.

Body mass index	Number	Percentage
<18.5	4	3%
18.5-24.5	52	39%
25-29.9	56	42%
>30	22	16%
Total	134	100%

As table shows the distribution of security guards according to their body mass index in which the 3% guards are underweight, 39% are normal, 42% are overweight and 16% are obese.



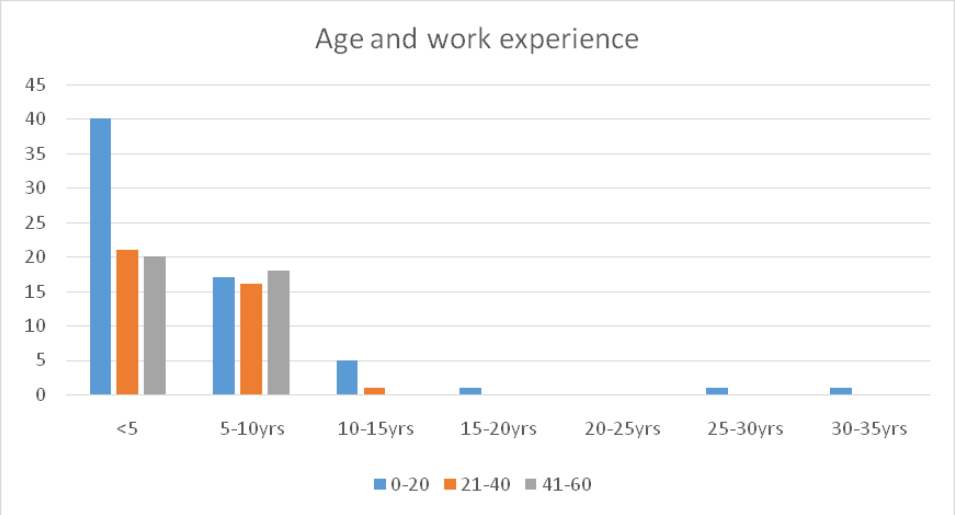
Graph 3: distribution of guards according to body mass index. It shows maximum percent in overweight and minimum in underweight.

Table no.4-Distribution of security guards according to their work experience.

Age Work experience	0-20	21-40	41-60
<5	40	21	20
5-10years	17	16	18
10-15years	5	1	0
15-20years	1	0	0
20-25years	0	0	0
25-30years	1	0	0
30-35years	1	0	0

As above table shows the distribution of working experience of security guards among which 40 security guards shows the minimal disability,21 having moderate disability and 20 guards having severe disability with less than 5 years of working experience. 17 guards having minimal disability, 16 having

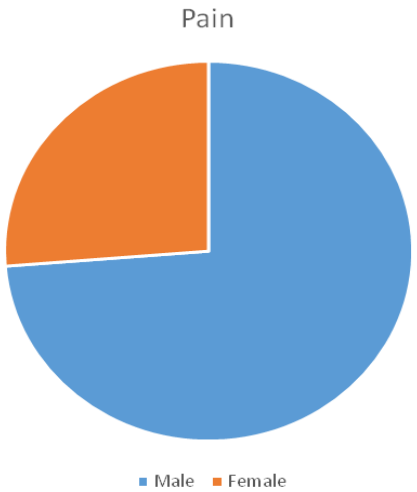
moderate disability, 18 having severe disability with 5 to 10 years of working experience. 5 guards having mild disability, 1 is having moderate disability with 10 to 15 years of working experience. 1 guard was having mild disability with 15 to 20, 25 to 30 and 30 to 35 years of working experience.



Graph 4: distribution according to work experience of guards.

Table no.5-Distribution of security guards according to low back pain.

	Male	Female	Total
Pain	29%	19%	48%
Total	73%	26%	100%



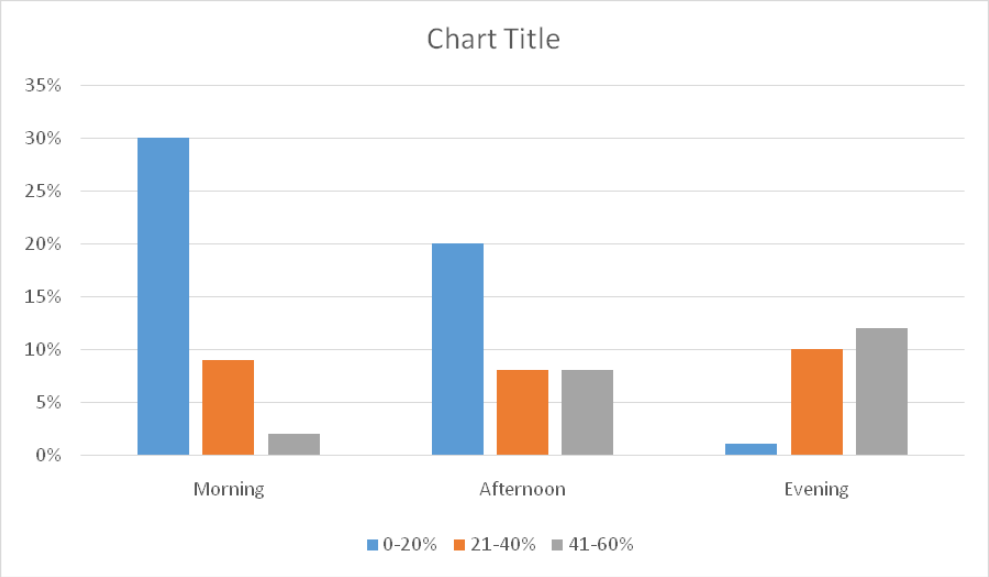
Graph 5: distribution of guards according to low back pain. Graph depict maximum in male than female.

As above table shows distribution of security guards according to their pain among which 48% having pain among which 29% male and 19% female were having low back pain

Table no. 6 –distribution of security guards according to shift wise low back pain.

Shift	0-20%	21-40%	41-60%
Morning	30%	9%	2%
Afternoon	20%	8%	8%
Evening	1%	10%	12%

As the above table shows the distribution of security guards who were having low back pain according to their Working shift. In morning shift 30% guards were having mild back pain 9% were having moderate and 2% were having severe back pain. In afternoon shift 20% were having mild, 8% were having moderate and severe back pain respectively. In the evening shift 1% were having mild back pain 10% were having moderate and 12% were having severe back pain.

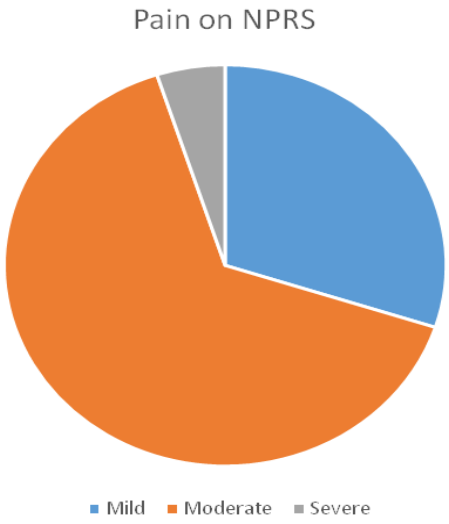


Graph 6: distribution of guards according to their shift. Graft depicts that maximum percent of pain in evening shift and minimum pain in morning

Table no.7 – Distribution of security guards according to their pain on NPRS

Mild	Moderate	Severe
30%	65%	5%

As the above diagram shows the distribution of pain in security guards according to their NPRS
score.30% guards are having mild pain, 65% having moderate and 5% are having severe pain.



Graph 7: distribution of guards according to their pain on NPRS. Sever in 5% of guards and mild in 30% of guards.

DISCUSSION

The present study "Prevalence of low back pain in security guards" was conducted to determine low back pain among security guards working in MGM Campus. In this study Oswestry Disability Index scale was used through which we got subjective information about low back pain affecting daily activities of individual.

The study was conducted with 134 subjects, out of 134, 48% of security guards were having low back pain. In this study we found that in 0-20% there were 69 participants from which 9 were female and 60 males. This showed minimal disability in which the guards cope with most living activities, usually no treatment is indicated apart from advising on lifting, sitting and exercises.

Researcher shows the range of 21-40% there were total 36 participants among which 17 were female and 19 males. This shows moderate disability in which the guards experience more pain and difficulty with sitting, lifting and standing. Travel and social life were more difficult and they may be disabled from work. Personal care, sexual activities and sleeping were not grossly affected and the patient can usually be managed by conservative means.

In the range of 41-60% there were total 29 guards from which 9 were female and 20 males. It shows severe disability. Pain remains the main problem but the activities of daily living were affected, these guards require detail investigation.

Another researcher Sandeep Kaur et al, found in his study in 2015 that prevalence of musculoskeletal disorder in security guards & he found majority of guards were having low back pain.[19] In our study, we found there were 48% of guards were having low back pain because of prolonged standing occupation. According to ODI score the maximum score is marked in standing and walking, so these factors were responsible for having maximum low back pain. In a prospective study of Canadian adolescents free of low back pain, smoking was found to be risk factor for the onset of low back pain, with subjects who smoked being more than twice as likely to report symptoms when compared to non-smokers.[21]

Another study by John McBeth et al in the 2007 found a community-based study in UK reported prevalence of low back pain in female compared to male and it was found that for both sexes increased with age until the sixth decade. Low back pain peaked for females aged 64-66years and males peak was at 54-56years. In our study there were total 134 participants among whom 74% were male and 26% were female so, it was found that 48% guards having low back pain among which 29% were male and 19% were female. So, we found lowback pain more in male security guards than female. Hypothesis proposed by Rhee. H in 2005 that men and women differentially vulnerable to developing pain and that factors such as hormonal status may act to increase susceptibility, in this hypothesis it has been investigated relationships between physical symptoms and pubertal development in adolescent& adult population.[22]

As per similar study by Michael J. DePalma et al in 2011 found that increased age was associated with a decreased probability internal disc disruption and increased probabilities of facet joint pain and sacroiliac joint pain as the source of low back pain until approximately age 70. According to our study the distribution of guards according to their age was found that maximum guards comes under 29-38 years of age that is 48% then 31% comes under 39-48 years and 19% comes under 18-28 years. There were more of guards comes under middle age so they were more prone for low back pain which is of either sacroiliac origin or factogenic origin and in younger patients it is due to internal disc disruption.[23]John McBeth et al in2007 found that ageing is associated with degenerative processes increased in symptom reporting as we age.[24]

Se Xian tan et al, in year of 2016 found that prevalence of excess body weight, waist circumference and percentage of body fat among security officer working in the study is high. High BMI and waist circumference were related to more frequent sick leaves and lower level of physical well-being, while high waist circumference is associated with higher level of bodily pain. In our study we found that maximum security guards 42%were overweight according to their body mass index and39% guards were normal and 16% were obese and 3% were under weight. So, the obesity can be one of the factors for developing low back pain in security guards.[25]

In this study total security guards were 134 out of which the guards who were having less than 5 years of working experience among them 40 in no. which were having minimum disability, 21 were having moderate disability and 20 guards were having severe disability. Guards with 5-10years of working experience among them 17 no. of guards were having minimal disability 16 were having moderate disability and 18 were having severe disability. Guards with 10-15 years of working experience among them 5 guards were having mild disability, 1 were having moderate disability. Only one guard in each category with 15-20 y, 25-30 y and 30-35 years of working experience were having mild disability.

So, we have concluded that maximum number of guards having low back pain comes under less than 5yrs of working experience which may occur due to

internal disc disruption.

According to our study there were 41% of guards who worked in morning shift. Out of which the distribution of ODI score were 30% of guards showed 0-20% of ODI score (mild disability), 9% of guards shows 21-40% ODI score (moderate disability), 2% showed 41-60% ODI score (sever disability) respectively. According to NPRS scale 30% guards having mild pain 65% having moderate and 5% having severe pain

In afternoon shift there were 36% of guards among which 20% guards showed 0-20% ODI score (mild disability), 8% showed 21-40% ODI score(moderate disability), 8 % showed 41-60% ODI score (severe disability)

In evening shift there were 23% of guards among which 1%, 10%, 12% of guards showed 0-20% (mild disability), 21-40% (moderate disability) and 41-60% (severe disability) ODI score respectively.

In our study we have found that guards who were having evening shift shown more percentage of low back pain disability because of lack of proper rest. And in morning and afternoon shift have less percentage of low back pain disability because guards can take proper rest in night so the percentage of low back pain is less.

Limitations of the present study were further study should be done on this topic because in our study we only included the guards working in MGM Campus. More number of samples can be consider with psychosocial factors. Interventions for such disability can be further studied on the basis of work conditioning and hardening.

CONCLUSION

Prevalence of low back pain among security guards at "MGM institute of health science" is 48%. Generally male security guards are more affected as compared to female security guards. Security guards having evening shift are more affected than morning and afternoon shift. According to NPRS scale maximum guards were having moderate pain and middle age was more prone to have low back pain which may occur because either of sacroiliac joint or facet joint pain. Among different components of security ODI score the standing, walking and travelling components are mostly affected.

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