



Assessment of gait and balance in security personnel's working in Pravara Medical Trust, Loni

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Abstract Background

Security guards are more prone for work related musculoskeletal disorder due to inappropriate position during work as they spend most of their working hours in standing position. The current study has explained the various factors that could affect gait and balance among security guards such as age, gender, years of experience. The primary purpose of this study was to determine normative values for foot and ankle disability, activities of daily living.

Methods

137 Participants were selected based on inclusion and exclusion criteria, from Pravara medical trust, Loni. An Informed Consent was taken, the data analysis included the application of Foot and ankle disability index in the form of a questionnaire. The entire data was configured and analysed via percentage and statistical presentation.

Results

It is descriptive cross-sectional study, there were 137 participants in this study (43 women, 94 men, average age=45.66 (SD =3.60) years, average years of experience=13.29 (SD=5.66)), average FADI score=102.28 (SD=13.97) Women had significantly higher gait and balance issue as compare to men. Younger people and those with least work experience had higher ankle function.

Conclusion

This study revealed that normative values of foot and ankle disability index [ADL'S] and foot and ankle disability index [sport] do reflect function and differed by sex, years of experience, age.

Keywords

Foot and ankle disability index, balance, gait

Introduction

Security guards are more prone for work related musculoskeletal disorder due to inappropriate position during work. Standing for more than 4 hours per day exposes a worker to back leg discomfort and lumbar pain, even after 2 hours of extended rest. As a result, they are at high risk as compare to other profession of standing for extended period of time. Their profession affects their daily ADL'S, gait, posture and balance.¹

Prevalence of gait disorder increases with age. Person's gait can be disturbed due to dysfunction of any of the above components. The safety and efficacy of normal walking

depends on interaction between executive control dimension (decision of action and integration) and on sensorimotor system with cognitive dimension (navigation and attention)²

Balance is a complex skill based on the interaction of dynamic sensorimotor processes. Postural instability occurs particularly in elderly individuals due to combination of decreased sensitivity in sensors, less effective sensory information input to the central nervous system, and reduced muscular capacity.³

Foot ankle disability index [FADI] is one of the most widely used questionnaires, first described by Martin et al in 1999. It consists of 4 pain related items and 22 actively related items. The FADI scale consist of total 26 items, grouped in three different categories of question: 1-16 related to walking, 17-22 related to daily activities and 23-26 items are related to pain, each item can be scored on 5 points Likert score [from 0 to 4], with maximum total score of 104 points. the FADI-S consists of 8 items with a total possible score of 32 points. The minimum score of zero (0) corresponds to worst possible condition i.e., severe limitation in walking and daily activities as well as pain presence, the best possible score (104) corresponds to complete absence of any difficulty in daily activities and no pain.⁴

Muscle, tendon, joints, peripheral nerves etc. gets affected by wide range of inflammatory and degenerating condition. It affects multiple joint leading to increase job restriction, increase absenteeism and causes long term pain, fatigue and physical disability.⁵

The major risk factors are lifting and carrying heavy objects, awkward posture, and job dissatisfaction, repetitive movement, static workload, bed making etc. Other risk factors are predictors of gait, balance and musculoskeletal disorders are sleep problem, not doing regular physical exercise, dissatisfaction with working environment and culture, duration of employment, pulling and pushing heavy load, bending and working with twisted trunks, alcohol consumption and lack of rest.

Materials and method

Design-

The cross-sectional descriptive study was conducted in Dr. APJ Abdul Kalam College of Physiotherapy. The study duration determined was 6 months with a sample size of 137 participants.

Study design was prepared and approval from the institutional ethical committee was taken. The demographic data of the participant was obtained which includes name, age, sex, years of experience.

On the basis inclusion and exclusion criteria the samples were identified. Informed consent was taken after explaining the procedure to the participant.

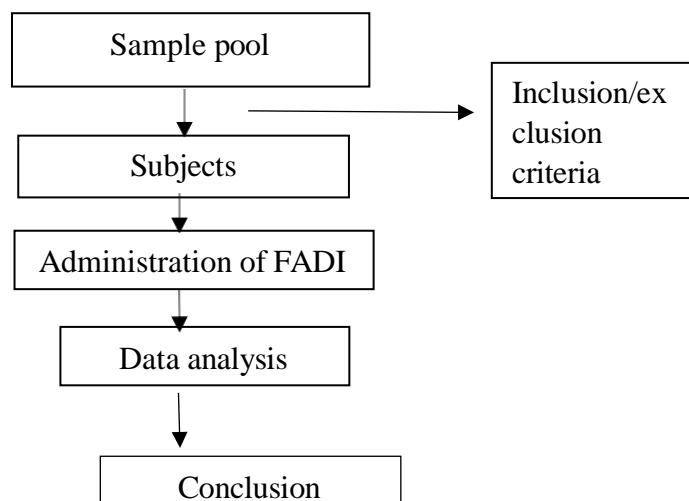
Selection criteria

Participants were eligible for study if they were aged between 40-60 years. Security guards who work in Pravara medical trust. Those who are willing to give informed consent.

Exclusion criteria included Individuals who are not under any medical treatment, or any other chronic complications which can interrupt the participation in the study. Those individuals

who are unavailable during study period. Those individuals who are having communication issues

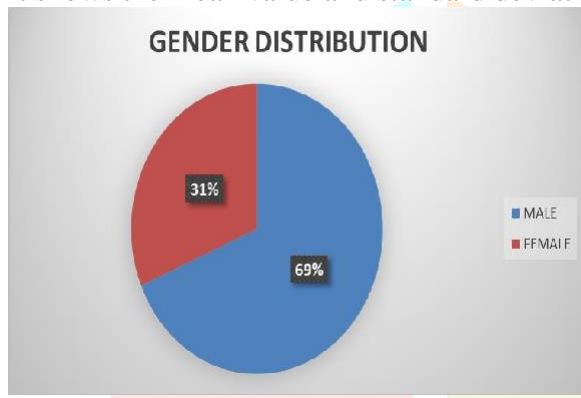
Flow chart of procedure



Results**TABLE 1: MEAN AND STANDARD DEVIATION SCORE**

	MEAN	STANDARD DEVAITION
Age	45.66	3.60
Years of experience	13.29	5.66
FADI (ADL's and pain)	85.78	9.94
FADI sports	16.50	5.38
Total FADI score	102.28	13.97

It shows the mean value and standard deviation of age, years of experience, FADI & FADI Sports

**Chart 1: Gender distribution among participants**

This study included a total of 137 participants out of which 69% (94) of the participants were males and 31% (43) were females as shown in chart 1

**Chart 2: Distribution of participants according to their years of experience**

participants which were further categories according to their years of experience, 35% (48 participants) have work experience of 1-10 years, 50% (68 participants) have 11-20 years of work experience, 15% (21 participants) have years of experience of 21-30 years.

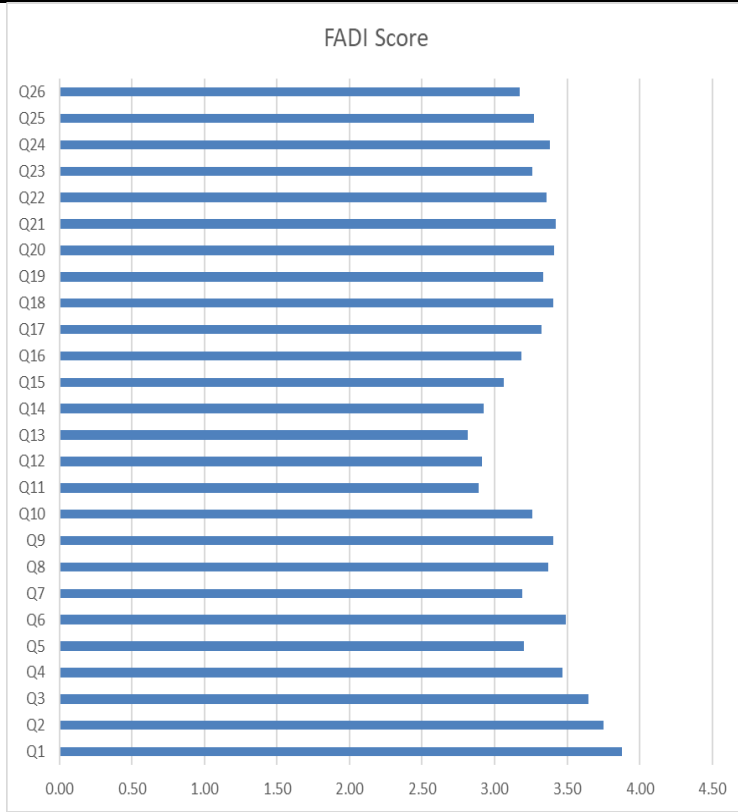


Chart 3: Foot and Ankle Disability Index mean score

FADI Scale was used as an outcome measure to assess the ADL'S and pain parameters among participants. FADI scale includes total 26 questions, this graph shows that maximum number of participants have responded highest for Q1 [3.88] and lowest for Q13[2.82]

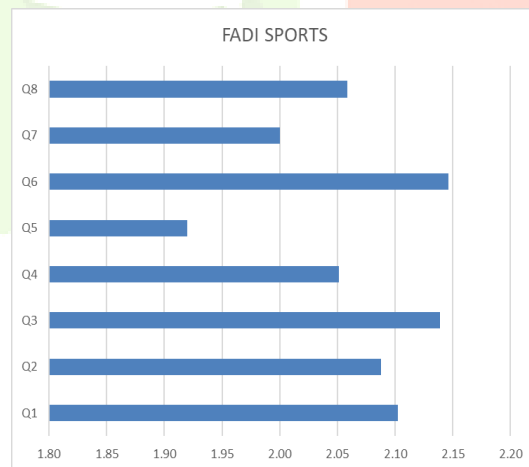


Chart 4: Foot and Ankle Disability Index: Sports mean score

FADI sports was used as outcome measure to assess the sports components and ability to return to desired sports among participants, participants responded highest to Q6 [2.15] and least to Q5[1.92]

Discussion-

The present study was conducted to assess the gait and balance among security personnel. Security guards are more prone for work related musculoskeletal disorder due to inappropriate position during work as they spend most of their working hours in standing position.

The current study has explained the various factors that could affect gait and balance among security guards such as age, gender, years of experience. The age group selected for survey is between 40 to 60 years, working span of participants is between 1 to 30 years. This study included 137 participants out of which 69% male and

31 % female. The participants were further categories according to their years of experience, 35% (48 participants) have work experience of 1-10 years, half of the population i.e., 50% (68 participants) have 11-20 years of work experience, 15% (21 participants) have years of experience of 21-30 years. According to inclusion criteria, participants are divided in 2 age categories 88% of participants (121) belongs to 40-50 years of age group and 12% of participants (16) belongs to 51-60 years of age group. This study shows that the younger age group security personnel are better in managing gait and balance as compared to older age group. Participants with less working experience are not prone to have gait and balance abnormalities. In FADI [ADL'S and pain component] the patient has responses has been transformed in average score, each item can be scored on 5 points Likert score [from 0 to 4]. The participants have responded highest to Q1 i.e., standing [average score 3.88] according to participants scoring participants did not faced any difficulties in standing, walking on even ground, walking on uneven ground, home responsibilities and personal care. The participants have responded least to Q 13 i.e., walking uphill and downhill [average score 2.82] the participants are facing more difficulties in going up and down stairs, squatting, light to moderate work and recreational activities.

According to pain component participants have responded maximum to Q23 i.e., general level of pain and Q25 i.e., pain during normal activity [average score 3.26 and

3.27 respectively]. In FADI sports participants responses has been transformed in average score, participants responded highest to Q6 i.e., low impact activities and least i.e., Linkert score 0[unable to do] to squatting and stopping quickly.

The same study was done previously by Lauren et.al on Patient Reported Outcome Measures in the Foot and Ankle: Normative Values Do Not Reflect 100% Full Function this study was done to determine normative values for foot and ankle ability measure (FAAM), activities of daily living (ADL), FAAM/foot and ankle disability (FADI) Sport. There was no significant difference in FAAM ADL between women and men or FAAM Sport. However, my study showed that on an average woman were more affected than men. Young people with lower BMI had significantly higher ankle function where as in my study participant in 40-50 years age group with less years of work experience have higher ankle function, stable gait and good balance. This study revealed that normative values of foot and ankle outcome measures did not reflect 100% function and differed by sex, previous ankle surgery status, age and BMI. On the contrary, my study showed that foot and ankle stability gets affected by sex, years of work experience and age. The contributing characteristics are prolonged standing jobs, long duty hours, pathophysiological changes like degeneration of bones, decreasing joint pain, osteoarthritis, inappropriate footwear, mental stress and menopause.

According to one of the research studies on security guards belonging to the age group of 25 – 60 years found out that, 96.6 % had musculoskeletal disorders in various areas while 3.3 % did not complain of any musculoskeletal discomfort in any area. There is positive correlation

between body mass index, height, weight, age, and the musculoskeletal disorders. Similarly, my study showed same results there is a positive correlation between gender, age and years of experience.

The main target of this study is to decrease the occurrence and offer AID in enduring gait and balance abnormalities and activities of daily living among security personnel.

Conclusion-

This study revealed that normative values of foot and ankle disability index [ADL'S] and foot and ankle disability index [sport] do reflect function and differed by sex, years of experience, age. This study concluded that participant in 40-50 years age group with less years of work experience have higher ankle function, stable gait and good balance. As a result, security officers spend their entire working time standing. they are at high risk as compare to other profession of standing for extended period of time. Their profession affects their daily ADL'S, gait, posture and balance.

Limitations

As the study was time bound, Sample pool was small. In the current study Generalized population was involved. Samples were selected only from PMT, Loni. Subjects faced language barrier

Clinical implication

Physiotherapist and personnel's department should design a proper ergonomic plan for security guards with proper schedule and exercises,

Future scope of study

The main target of this study is to decrease the occurrence and offer AID in enduring gait and balance abnormalities and activities of daily living among security personnel.

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