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Prevalence of musculoskeletal problems and its impact on the health-related quality of life among the cricketers

Smrutimeera Sahoo[1*], Khamer Anisa Fathima[2]

Lecturer, Department of Occupational Therapy, Acharya Institute of Allied Health Science, Bangalore, India
Post Graduate Student, MOT in Hand and Musculoskeletal Condition, Manipal University, Udupi, Karnataka, India

***Corresponding Author: Smrutimeera Sahoo**
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ABSTRACT

Cricket is that the hottest sport in India far and away, and is played almost everywhere. It is increasingly demanding sports, so require skilled movement and physical fitness. The continuous changing posture of the bats man are causing the complications like pain and discomfort affecting the day to day functions, so as quality of life. A necessity was felt to assess the health status and quality of life of the cricketers for which Occupational Therapy treatment can be implemented to overcome the physical discomfort and to give better quality of life. This study aims to determine the prevalence of musculoskeletal problems and its impact on physical and mental health-related quality of life among the cricketers. The study included a quantitative cross-sectional design which was conducted among the male cricketers sampling from different cricket and cricket club in Tamilnadu. Modified Nordic Musculoskeletal Questionnaire was used to determine the prevalence of musculoskeletal problems and RAND 36-Item Health Survey 1.0 Questionnaire was used to determine the impact of musculoskeletal problems on the physical and mental health- related Quality of Life. Based on convenience sampling 50 male cricket players were included with age range of 18-33 years and the study results concluded that, out of 50 participants 48 (96%) of the population have trouble in last 12 months (such as musculoskeletal ache, pain, discomfort, numbness) in different parts of body. The Physical composite score and Mental composite score mean was 39.95 and 49.58 respectively which associated with a lower health-related quality of life among cricket players specifically in the domains of physical functioning, physical health, bodily pain as well as emotional problems and energy/fatigue resulted in considerably lower HRQoL. The relationship impact of variables having trouble in last 12 months, showed a p-value for variables of shoulder ($p = 0.00526$) and wrists/hands ($p = 8.4e-06$) were significant in impacting the PCS and the p-value for variable Wrists/Hands ($p = 0.0439$) was significant in impacting MCS. Similarly, the correlation impact variables of having trouble in last 12 months of being prevented from carrying out the normal activities, showed a p-value for variables of shoulder ($p = 0.000362$) and wrists/hands ($p = 0.002213$) were significant in impacting the PCS. This study concluded that male cricketers have a high level of prevalence of musculoskeletal problems especially in shoulder, wrists/hands and neck followed by the lower extremity and these high prevalence (i.e., variables of shoulders, wrists/hands and neck) musculoskeletal problems have significant impact in their physical (PCS) and mental (MCS) health-related quality of life.

Keywords: Cricket, Prevalence, Musculoskeletal problems, Health-related Quality of life, Physical health, Mental health

INTRODUCTION

Cricket is the hottest sport in India far and away, and is played almost everywhere. It is increasingly gaining its important in all Southeast Asiatic nations. The growth over the previous few eras has put larger demand for cricket players as it increases hours of play and performance boost hope. Cricket is dynamic sport which involves many abstract skills and movement. To improve this skill and movement, many players ensure that they keep the body fit and strong. There are three unique aspects of the game-bowling, batting and fielding related with the risk of injury. (P. Sathya, 2017) A fast bowler will put tons of stress on their back and leg muscles, furthermore on other joints of lower extremities.

Maintaining flexibility is crucial to avoid injury and it will help them to bowl faster. Having a good level of core, them in maintaining with accuracy, balance, and speed. (Matt McLellan, 2021)

The four fundamental skills (batting, bowling, fielding, wicket- keeping) for playing cricket, where the key word of use has been practice. This persistent practise could eventually lead to high level of musculoskeletal problems such as ache, pain, discomfort, numbness, etc., affecting the quality of health in cricketers. (Matt McLellan, 2021)

Musculoskeletal problems occur as result of the mismatch between the ability of the human body to hold the external load to the physical and posture exertion. The recovery period is essential after the extent of load, the frequency and duration of loading. (Esa-Pekka Takala, 2020). Musculoskeletal problems can occur when player is being struck by a ball or bat, rapid rotational movements, sliding and diving, collisions with other players and overuse injuries and also when ball handle leading to micro trauma and injury occur on body by large scale. A solitary high power and effective play leads to a greater level of injury. (P. Sathya, 2017)

All these would lead to greater issues of musculoskeletal problems which can appear with various symptoms of discomfort like pain, fatigue, muscle weakness, stiffness and limitation of movements, sensory loss and numbness, or local swelling and increased heat because of inflammation. (Esa-Pekka Takala, 2020)

An annual musculoskeletal injuries prevalence of 10.97%, in Indian cricketers, in which the prominent anatomical sites of injury were shoulder (22.85%), lumbar spine (17.14%) and knee (11.42%). Medium pacers sustained 25.71% of the injuries. Age range of 18-24 years had a prominent 37.14% of overuse musculoskeletal injuries of which 71.42% were lumbar spine injuries. (Manasa Raghavendra Rao, 2020)

The prevalence of musculoskeletal problems among the club level Indian cricketers within the last 12 months was 61% of participants experienced musculoskeletal problems in which lower back, knee and ankle are the three commonest problems in cricket players. (P. Sathya-2017). At Haryana out of 127 participants 50 players was injured which led to overall prevalence of 39% injuries among cricket players in which low back, ankle and shoulder are the primary three commonest areas of injuries among cricketers. (Sumit Kumar, 2015)

The WHO in 1948 stated "health as the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Since then, QOL has become more important in health-care practice and research areas. The term "health-related quality of life" is a "multidimensional concept that can be viewed as a latent construct which describes the physical, role functioning, social, and psychological aspects of well-being and functioning" (Bullinger, 1991; Calman, 1987; Spilker, 1990) and it includes both objective and subjective . (Maartje de Wit.,2013)

When compared to LE pain and discomfort, UE pain can have various barriers to physical activity involvement, it is also determined that Upper extremity (UE) pain has been relatively reducing the physical activity and function and impaired HRQoL cricketers. (Garrett Scott Bullock, 2019)

METHODOLOGY

Research design

A cross-sectional study design was adopted and convenience sampling method was applied to recruit the participants for the study.

Sample

A sample size was calculated based convenience sampling and fifty number of cricket players were recruited from different cricket academy and cricket club in Tamil Nadu.

Screening criteria

Participants were recruited from different parts of Tamil Nadu.

Inclusion criteria

- The inclusion criteria for the study were that the participants should be age of 18 years and above.
- Male participants were included in the study.
- The participants must have practised cricket for more than 6 months and should be a current cricketer.

Exclusion criteria

- Cricketer players of age group below 18 years and female players were excluded from the study.
- The players who have practised cricket less than 6 months are excluded.
- Players undergoing other associated psychiatric conditions or any other physical disability is also excluded from the study.

Instruments used

Modified Nordic musculoskeletal questionnaire (I. Kuorinka, et al, 1987)

Nordic musculoskeletal questionnaire is a valuable tool enabling large scale surveys into extent of self-reported musculoskeletal complaints (Kuorinka, et al., 1987). The Nordic Council of Ministers sponsored a study which established the Nordic Musculoskeletal Questionnaire (NMQ). The aim was to develop and test a standardized questionnaire methodology allowing judgment of low back, neck, shoulder and general complaints for use in epidemiological studies. The tool was not developed for clinical diagnosis. (Joanne O. Crawford, et al., 2007).

Administration: It is a self-administrated questionnaire and the respondents must have sufficient ability to understand the context. If the person doesn't have adequate knowledge, concerned therapist can help the person out to fill up the questionnaire.

Psychometrics: The Cronbach's Alpha value is in the range of 0.965- 0.966. (Aulia Chairani, et al., 2020). It's a highly validated tool of 87.2% assessed using the Content Validity Index (CVI).

Scoring and Interpretation

Section 1: A general questionnaire of 40 forced-choice items identifying areas of the body, causing musculoskeletal problems. Completion is assisted by a body map to indicate nine symptom sites being neck, shoulders, upper back, elbows, low back, wrist/hands, hips/thighs, knees and ankles/feet. Respondents are enquired if they have had any

musculoskeletal trouble in the last 12 months and last 7 days which has prevented normal activity. (Joanne O. Crawford, 2007).

Section 2: Additional questions relating to the neck, the shoulders and the lower back further for a detailed relevant issue. 25 forced-choice questions provoke any accidents affecting each area, functional impact at home and work (change of job or duties), duration of the problem, assessment by a health professional and musculoskeletal problems in the last 7 days. (Joanne O. Crawford, 2007).

The Nordic Musculoskeletal Questionnaire (NMQ) is been used for the screening of musculoskeletal problems. Higher levels of statistic establish there is a problem and identify the body area affected and if a low level of statistic establishes, further action is not be overlooked if accessibility and straightforward but may be regarded of lesser priority until high and medium situations had been tackled. (Claire Dickinson, 1998)

RAND 36-Item Health Survey 1.0 Questionnaire

(Hays, R. D., 1993).

The RAND 36-Item Health Survey (Version 1.0) consists of eight concepts: physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, and general health perceptions. It also includes a single item that offers an indication of perceived change in health.

Administration: It is a self-administrated questionnaire and the respondents must have sufficient ability to understand the context. If the person doesn't have adequate knowledge, concerned therapist can help the person out to fill up the questionnaire.

Psychometrics

The PCS and MCS has been found to have high reliability of 0.88 and 0.82, respectively (Garrett S. Bullock, et al., 2019). The overall Cronbach's α coefficient of the SF-36 was reliable and valid. (Yang Zhang., 2012)

Scoring and Interpretation: Scoring the RAND 36-Item Health Survey is a two-step process.

Step 1: Recoded numeric values are recoded per the scoring key. Note that all items are scored so that a high score defines a more favourable health state. In addition, each item is scored on a 0 to 100 range so that the lowest and highest possible scores are set at 0 and 100, respectively. Scores represent the percentage of total possible score achieved.

Step 2: Items in the same scale are averaged together to create the 8 scale scores. The items averaged together to create each scale. Items that are left blank (missing data) are not taken into account when calculating the scale scores. Hence, scale scores represent the average for all items in the scale that the respondent answered.

The eight subscales

Physical functioning (PF), role limitations of physical health (RP), bodily pain (BP), general health (GH), vitality-energy/fatigue (VT), social functioning (SF), emotional-wellbeing (RE), and role limitation due to emotional problems (MH). The first four scores can be summed to create the physical composite score (PCS), while the last four can be summed to create the mental composite score (MCS) respectively which both have high reliability in general population samples. Scores for the SF-36 scales range between 0 and 100, with higher scores indicating a healthier HRQOL. (Yu-Xia Zhu, et al., 2016)

Interpretation: The PCS and MCS are calculated using a normative based algorithm, using data from a sample of the 1998 United States general population. A mean of 50 is considered as the normative average, and group mean scores below 47 are interpreted as below the average range of the general population. (Garrett S. Bullock, 2020)

Significant features:

*****Significant (p value)

Data collection procedure

The permission was taken from the concern authority. The fifty participants are selected according to the inclusion and exclusion criteria. The purpose of study was explained to each participant and an informed consent form was obtained.Modified Nordic Musculoskeletal Questionnaire scale and RAND 36-item health survey 1.0 questionnaire (short form-36) was distributed to the participants through google forms.The subjects are instructed to go through the scales, to mark against the appropriate response which ever they felt was closely corresponding to their character and the filled forms were collected through online mode.Data collection was administrated for 2 weeks. Mean values were calculated after the data collection for data analysis.

Data analysis procedure

The statistical analysis was performed using SPSS 24.0 version.

RESULTS AND INTERPRETATIONS

This chapter deals with the statistical analyses of the data and the results obtained from the analysis of different variables of the research.

Statistical analysis

A cross-sectional study comprising of (N=50) cricket players was carried out to determine the prevalence of musculoskeletal problems in cricketers and its significance impact on physical and mental health-related quality of life by the data analysed using the Social Science Statistical kit (SPSS 24.0 version). Mean, standard deviation (SD) and correlation co-efficient was used to address the research questions.

Continuous measurements results are reported on the Mean, SD and categorical measurement results are reported in numbers (percentage).

When *p value < 0.05 it is significant. The following assumptions are made regarding data,

- Standardly, dependant high prevalence variables are obtained.
- Baseline characters of the study were enlisted following comparative inspection.
- Graphical representations were created to accurately reflect the demographic features of the group.

The following distribution tables show the demographic data distributions of the participants:

Table 1a: Age category distribution

Age category	Frequency	Percentage	N
18-21	21	42%	50
22-25	18	36%	50
26-29	6	12%	50
30-33	5	10%	50

Table 1a shows the distribution percentage of age category of the participants, out of 50 cricket participants belongs to 18-21 years category, which is 42%.

Table 1b Distribution of experience

Experience	Frequency	Percentage	N
>6 months	2	4%	50
1 year	1	2%	50
2 years	3	6%	50
>2 years	44	88%	50

Table 1b shows the data of distribution percentage of the experience years of the participants, out of 50 cricket participants 88% of participants are greater than 2 (>2 years) years of experienced.

Table 1c Distribution of designated role in cricket

Designated role	Frequency	Percentage	N
Batsman	12	24%	50
Bowler	10	20%	50
All-rounder	25	50%	50
Others	3	6%	50

Table 1c shows the distribution percentage of designated role as all-rounder (Batsman and Bowler) among participants.

Table 1d Hand dominance distribution

Hand dominance	Frequency	Percentage	N
Right hand	46	92%	50
Left hand	4	8%	50

Table 1d shows the distribution percentage of right hand dominance is 92% of all participants.

The following distribution tables show the prevalence of Musculoskeletal problems among the cricketers:

Table 2a: Prevalence distribution of having trouble in last 12 months

Variables	Prevalence		N
	Count	Percentage	
Neck	28	56%	50
Shoulders	38	76%	50
Upper back	16	32%	50
Elbows	11	22%	50
Wrists/Hands	31	62%	50
Lower back	29	58%	50
Hips/Thighs	26	52%	50
Knees	15	30%	50
Ankles/Feet	20	40%	50

Table 2a shows the shoulder gets higher prevalence (76%) pain and discomfort among all cricket players as compared to all others parts of upper and lower extremity.

Table 2b: Prevalence distribution of having prevented from carrying out the normal activities in last 12 months

Variables	Prevalence		N
	Count	Percentage	
Neck	24	48%	50
Shoulders	34	68%	50
Upper back	15	30%	50
Elbows	10	20%	50
Wrists/Hands	31	62%	50
Lower back	17	34%	50
Hips/Thighs	16	32%	50
Knees	14	28%	50
Ankles/Feet	19	38%	50

Table 2b shows the prevalence distribution out of 50 cricket players 68% of participants had trouble due to shoulders among all structures which is being assessed during the last 12 months having prevented from carrying out the normal activities.

Table 2c: Prevalence distribution of consulting a physician in last 12 months

Variables	Prevalence		N
	Count	Percentage	
Neck	9	18%	50
Shoulders	25	50%	50
Upper back	9	18%	50
Elbows	5	10%	50
Wrists/Hands	21	42%	50
Lower back	9	18%	50
Hips/Thighs	10	20%	50
Knees	6	12%	50
Ankles/Feet	7	14%	50

Table 2c shows that out of 50 cricket players, only 50% of participants only had shown to the doctors for shoulder discomfort.

Table 2d: Prevalence distribution of having trouble in last 7 days

Variables	Prevalence		N
	Count	Percentage	
Neck	15	30%	50
Shoulders	25	50%	50
Upper back	15	30%	50
Elbows	6	12%	50
Wrists/Hands	22	44%	50
Lower back	15	30%	50
Hips/Thighs	11	22%	50
Knees	8	16%	50
Ankles/Feet	13	26%	50

Table 2d shows the prevalence distribution out of 50 cricket players 50% of people have felt the discomfort in shoulder within 7 days.

Table 3a: Physical composite score and Mental composite score mean values

Average	Mean	SD	N
PCS	39.95	18.529	50
MCS	49.58	14.843	50

Table 3b: PCS and MCS domain mean scores

Domains	Mean	SD	N
PCS Domains			
Physical functioning (PF)	35.6	22.64	50
Role limitations due to physical health (RP)	21.0	30.56	50
Bodily pain (BP)	48.5	25.03	50
General health (GH)	54.7	15.27	50
MCS Domains			
Role limitations due to emotional problems (MH)	40.6	30.76	50
Energy/fatigue levels (VT)	50.0	15.42	50
Emotional well-being (RE)	56.3	17.24	50
Social functioning (SF)	54.0	16.28	50

Table 3a & b shows the mean average scores of Physical composites (summary mean scores of physical functioning, role limitations of physical health, bodily pain, general health) Score as 39.95 and Mental Composites (summary mean scores of role limitations due to emotional problems, energy/fatigue level, emotional well-being, social functioning) Scores as 49.58 with a standard deviation of 18.529 and 14.843 respectively.

Table 4a: Neck variable

Yes	Percentage	No	Percentage
28	56%	22	44%

Table 4a shows the percentage prevalence of participants who answered yes as 56% (28 count) and no as 44% (22 count) for the neck variable.

Table 4b: Shoulders variable

Yes	Percentage	No	Percentage
38	76%	12	24%

Table 4b shows the percentage prevalence of participants who answered yes as 76% (38 count) and no as 24% (12 count) for the shoulder variable.

Table 4c: Wrists/Hands variable

Yes	Percentage	No	Percentage
31	62%	19	38%

Table 4c shows the percentage prevalence of participants who answered yes as 76% (38 count) and no as 24% (12 count) for the wrists/hand's variable.

Model results: Shows the impact of physical health and mental health in relationship to the Table No.4.4a, b & c summary variables.

Table 5a: Summary mean score for variables under consideration of PCS Score

Variables		Mean Score (SD)
Neck	Yes	39.8 (17.45)
	No	40.1 (20.24)
Shoulders	Yes	35.9 (17.8)
	No	52.8 (15.06)
Wrists/Hands	Yes	31.5 (15.60)
	No	53.8 (14.32)

Table 5a shows the mean score (SD) of the variables under consideration for PCS, the neck has a mean as 39.8(17.45) for YES and 40.1(20.24) for NO, the shoulders have a mean as 35.9(17.8) for YES and 52.8(15.06) for NO, the wrists/hands have a mean as 31.5(15.60) for YES and 53.8(14.32) for NO.

Table 5b: Impact on Physical health in relation with the neck, shoulders and wrists/hands variable

Coefficients	Estimate	Std. Error	P value
Neck	3.265	4.069	0.42643
Shoulders	-13.863	4.731	0.00526*
Wrists/Hands	-21.018	4.192	8.4e-06*

Table 5b Shows the * p-value < 0.05 (less than 0.05). The p-value for variables, Shoulder and Wrists/Hands are less than 0.05 (level of significance); hence are significant in impacting physical health.

Table 6a: Summary mean score for variables under consideration of MCS Score

Variables		Mean Score (SD)
Neck	Yes	51.9 (14.25)
	No	46.6 (15.38)
Shoulder	Yes	47.6 (14.18)
	No	55.7 (15.85)
Wrist/Hand	Yes	46.3 (12.31)
	No	54.9 (17.30)

Table 6a shows the mean score (SD) of the variables under consideration for MCS, the neck has a mean as 51.9(14.25) for YES and 46.6(15.38) for NO, the shoulders have a mean as 47.6(14.18) for YES and 55.7(15.85) for NO, the wrists/hands have a mean as 46.3(12.31) for YES and 54.9(17.30) for NO.

Table 6b: Impact on Mental health in relation with the neck, shoulders and wrists/hands variables

Coefficients	Estimate	Std. Error	P value
Neck	6.827	4.018	0.0961
Shoulders	-7.254	4.672	0.1274
Wrists/Hands	-8.580	4.140	0.0439*

Table 6b shows the *p-value < 0.05 (less than 0.05). The p-value for variable Wrists/Hands is < 0.05(level of significance) hence is significant in impacting mental health.
The below results show the variables of neck, shoulders, wrist/hands for the last 12 months been prevented from carrying out normal activities (e.g., job, housework, hobbies) because of the trouble in high prevalence variables. Level of significance used for testing is 5%.

- PCS Average ~ Neck + Shoulders + Wrists/Hands
- MCS Average ~ Neck + Shoulders + Wrists/Hands

Summary of variables under consideration

Table 7a: Neck variables

Yes	Percentage	No	Percentage
24	48%	26	52%

Table 7a shows the percentage prevalence of participants who answered yes as 48% (24 count) and no as 52% (26 count) for the neck variable.

Table 7b: Shoulders variable

Yes	Percentage	No	Percentage
34	68%	16	32%

Table 7b shows the percentage prevalence of participants who answered yes as 68% (34 count) and no as 32% (16 count) for the shoulder variable.

Table 7c: Wrists/Hands variable

Yes	Percentage	No	Percentage
31	62%	19	38%

Table 7c shows the percentage prevalence of participants who answered yes as 62% (31 count) and no as 38% (19 count) for the wrists/hand variable.

Model results: Shows the impact of physical health and mental health in relationship to the Table No. 4.7a, b & c summary variables.

Table 8a: Summary mean score for variables under consideration of PCS Score

Variables		Mean Score (SD)
Neck	Yes	37.6 (16.86)
	No	42.1 (20.03)
Shoulder	Yes	32.2 (15.85)
	No	56.3 (12.16)
Wrist/Hand	Yes	31.9 (15.68)
	No	53.1 (15.24)

Table 8a shows the mean score (SD) of the variables under consideration for PCS, the neck has a mean as 37.6(16.86) for YES and 42.1(20.03) for NO, the shoulders have a mean as 32.2(15.85) for YES and 55.3(12.16) for NO, the wrists/hands have a mean as 31.9(15.68) for YES and 53.1(15.24) for NO.

Table 8b: Impact on Physical health in relation with the neck, shoulders and wrists/hands variables

Coefficients	Estimate	Std. Error	P value
Neck	4.276	4.260	0.320723
Shoulders	-17.684	4.592	0.000362*
Wrists/Hands	-15.617	4.818	0.002213*

Table 8b shows the *p-value < 0.05 (less than 0.05). The p-value for variables Shoulders and Wrists/Hands are < 0.05(level of significance) hence are significant in impacting physical health.

Table 9a: Summary mean score for variables under consideration of MCS Score

Variables		Mean Score (SD)
Neck	Yes	49.1 (13.83)
	No	50.0 (15.98)
Shoulder	Yes	47.1 (12.31)
	No	54.8 (18.52)
Wrist/Hand	Yes	46.1 (12.69)
	No	55.3 (16.62)

Table 9a shows the mean score (SD) of the variables under consideration for MCS, the neck has a mean as 49.1(13.83) for YES and 50.0(15.98) for NO, the shoulders have a mean as 47.1(12.31) for YES and 54.8(18.52) for NO, the wrists/hands have a mean as 46.1(12.69) for YES and 55.3(16.62) for NO.

Table 9b: Impact on Mental health in relation with the neck, shoulders and wrists/hands variables

Coefficients	Estimate	Std. Error	P value
Neck	3.351	4.497	0.4599
Shoulders	-4.206	4.847	0.3901
Wrists/Hands	-8.888	5.086	0.0872

Table 9b shows the p-value for variables is> 0.05 (greater than 0.05). (Level of significance) and no variables are significant in impacting mental health.

DISCUSSION

This chapter summarizes the findings and integrates the result with the past literature and offer explanations to the present research based on the results.

The sample consists of 50 male cricket players (N=50) since the sport cricket is commonest game played by the male population, Table No. 4.1a, b, c & d and Figure No. 4.1 a, b, c & d the results interpret that, participants were falling within the age range of 18 to 21 years (42%), 22 to 25 years (36%), 26 to 29 (12%), 30 to 33 (10%). Based on the experience 88% of the cricket players are having >2years. Based on hand dominance of the cricket participants right hand (92%), which suggests that most of the cricketers gets the injury on the dominant hand.

The prevalence results reveal that out of 50 participants 48 (96%) of the population have trouble in last 12 months (such as musculoskeletal ache, pain, discomfort, numbness) and 45(90%) of population have trouble in last 12 months of being prevented from carrying out the normal activities with shoulder, wrists/hands and neck followed by lower extremity which doesn't give any significant changes among cricket players as shown in Table No. 4.2a & b and Figure No. 4.2a & b respectively. When compared to the Table No. 4.2c and Figure No. 4.2c that shows the prevalence distribution of having consulted by a physician in last 12 months and the prevalence distribution of having trouble in last 7 days, which shows relatively low percentage of prevalence. Despite the high prevalence of upper extremity musculoskeletal problems, a study done by Sumit Kumar, 2015 which shows a result that out of 127 players 50 was injured leading to 39% overall prevalence of musculoskeletal problems among cricket players where Low back, shoulder and ankle were the primary three commonest injuries in cricket players.

In Table No.4.3a and Figure No. 4.3a shows the mean scores of the physical composites score (i.e., the summary mean scores of the following domains: physical functioning, role limitations due to physical health, bodily pain and general health) as 39.95 and the mental composites score (i.e., the summary mean scores of the following domains: role limitations due to emotional problems, vitality-energy/fatigue level, emotional well-being and social functioning) as 49.58 with a standard deviation of 18.529 and 14.843 respectively. The mean score of PCS and MCS interprets that, the mean of PCS is below the average range (i.e., below the score 47) which indicate poor quality of life and the mean of MCS is negligibly below the normative average score (i.e., below the score 50) which is indicating the impact in quality of life. These results are supported by a study done by Garrett Scot Bullock, et al., 2019 in which 703 cricket players participated in which PCS was more impaired than MCS levels in former cricketers with UE pain (49.8 (44.9–54.8)).

Linear correlation analysis was done to evaluate the impact of musculoskeletal problems on physical and mental health-related QoL among the cricket players at any time during the last 12 months having trouble such as ache, pain discomfort, numbness. First three high prevalence variables in upper extremity were selected to co-relate with the PCS and MCS. The PCS and MCS was correlated with neck, shoulders and wrists/hands variables respectively.

In Table No. 4.4a, b & c. The shoulder (76%), wrists/hands (62%), neck (56%) showed the high prevalence of musculoskeletal problems among the upper extremity components which is considered as greater trouble and is been correlated with PCS and MCS.

The Table No. 4.5a & b and Figure No. 4.5aa, ab & ac show the summary mean score for variables of PCS impact of PCS, where the significant *p value< 0.05 (less than 0.05). When compared to participants with no trouble in neck the physical health score in participants with trouble in neck is expected to increase by 3.265 (std. error = 4.069) adjusting for the effect of trouble in shoulder and wrist, which is clinically and statistically not significant (p = 0.42643) in impacting the PCS, which shows less impact of neck discomfort on physical and mental health. When compared to participants with no trouble in shoulder the physical health score in participants with trouble in shoulder is expected to decrease by 13.863 (std. error = 4.731) adjusting for the effect of trouble in neck and wrist, which is clinically and statistically significant (p = 0.00526) in impacting the PCS. When compared to participants with no trouble in wrist/hands the physical health score in participants with trouble in wrist/hands is expected to decrease by 21.018 (std. error = 4.192) adjusting for the effect of trouble in shoulder and neck, which is clinically and statistically significant (p = 8.4e-06) in impacting the PCS.

Hence the p-value for variables of shoulder and wrists/hands are (p<0.05) less than 0.05 (level of significance), hence these variables are significantly impacting the PCS (physical health).

The Table No. 4.6a & b show the Figure No. 4.6aa, ab & ac show the summary mean score for variables of MCS and the impact of MCS, where the significant *p value< 0.05 (less than 0.05). When compared to participants with no trouble in neck the mental health score in participants with trouble in neck is expected to increase by 6.827 (std. error = 4.018) adjusting for the effect of trouble in shoulder and wrist, which is clinically and statistically not significant (p = 0.0961) in impacting the MCS. When compared to participants with no trouble in wrist/hands the mental health score in participants with trouble in wrist/hands is expected to decrease by 8.58 (std. error = 4.140) adjusting for the effect of trouble in shoulder and neck, which is clinically and statistically significant (p = 0.0439) in impacting the MCS.

Hence the p-value for variable Wrists/Hands is (p< 0.05) less than 0.05 (level of significance) hence is significant in impacting mental health.

Linear correlation analysis was been fitted to evaluate the impact of musculoskeletal problems on physical and mental health- related QoL among the cricket players in the last 12 months have been prevented from carrying out normal activities (i.e., job, housework, hobbies). First three high level prevalence variables in upper extremity were selected to co-relate with the PCS and MCS. The PCS and MCS was correlated with neck, shoulders and wrists/hands variables respectively.

In Table No. 4.7a, b &c. The shoulder (68%), wrists/hands (62%), neck (48%) showed the high prevalence of musculoskeletal problems among the upper extremity components which is considered as greater trouble and is been correlated with PCS and MCS.

The Table No. 4.8a & b and Figure No. 4.8aa, ab & ac show the summary mean score for variables of PCS and the impact of PCS, where the significant *p value< 0.05 (less than 0.05). When compared to participants with no trouble in neck the physical health score in participants with trouble in neck is expected to increase by 4.276 (std. error = 4.260) adjusting for the effect of trouble in shoulder and wrist, which is clinically and statistically not significant (p = 0.320723) in impacting the PCS. When compared to participants with no trouble in wrist/hands the physical health score in participants with trouble in wrist/hands is expected to decrease by 15.617 (std. error = 4.818) adjusting for the effect of trouble in shoulder and neck, which is clinically and statistically significant (p = 0.002213) in impacting the PCS.

Hence the p-value for variables of shoulder and wrists/hands are (p<0.05) less than 0.05 (level of significance), hence

these variables are significant in impacting the PCS (physical health).

The Table No. 4.9a& b and Figure No. 4.9aa, ab & ac show the summary mean score for variables of MCS and the impact of MCS, which reveals that when compared to participants with no trouble in neck the mental health score in participants with trouble in neck is expected to increase by 3.351 (std. error = 4.497) adjusting for the effect of trouble in shoulder and wrist, which is clinically and statistically not significant (p = 0.4599) in impacting the MCS. When compared to participants with no trouble in shoulder the mental health score in participants with trouble in shoulder is expected to decrease by 4.206 (std. error = 4.847) adjusting for the effect of trouble in neck and wrist, which is clinically significant but statistically not significant (p = 0.3901) in impacting the MCS.

Hence the p-value for variables of neck, shoulder and wrists/hands are (p>0.05) greater than 0.05 (level of significance), hence these variables are not significant in impacting the MCS (mental health).

These results are evidently supported by a study done by Eric L. Sauers, et al., 2011 in which the results was found that out of 25 female soft ball pitchers 60% of soft ball pitchers (15/25) stated mild to severe upper extremity pain late in their viable season and data from the same study population revealed that a history of sport- related injury in adolescent athletes is associated with lower health-related quality of life. Collectively, the findings demonstrated that despite the positive association of adolescent sport participation with HRQOL, the negative impact of sport-related injury on physical and mental health-related quality of life should be considered.

CONCLUSION

The study was conducted on male cricket players in Tamil Nadu with a sample population of 50 (N=50) participants and the study results concluded that, out of 50 participants 48 (96%) of the population have trouble in last 12 months (such as musculoskeletal ache, pain, discomfort, numbness) and 45(90%) of population have trouble in last 12 months of being prevented from carrying out the normal activities with a prevalence of shoulder, wrists/hands and neck as the first three commonest areas of problems in upper extremity followed by lower extremity among the cricket players. The PCS and MCS mean were 39.95 and 49.58 respectively which associated with a lower health-related quality of life among cricket players specifically in the domains of physical functioning, physical health, bodily pain as well as emotional problems and energy/fatigue resulted in considerably lower HRQoL. The correlation impact of variables having trouble in last 12 months, showed a p-value for variables of shoulder (p = 0.00526) and wrists/hands (p = 8.4e-06) were significant in impacting the PCS and the p-value for variable Wrists/Hands (p = 0.0439) was significant in impacting MCS. Similarly, the correlation impact variables of having trouble in last 12 months of being prevented from carrying out the normal activities, showed a p-value for variables of shoulder (p = 0.000362) and wrists/hands (p = 0.002213) were significant in impacting the PCS. Hence the study concluded that prevalence of upper extremity musculoskeletal problems has negative impact on the health-related quality of life especially on the PCS than MCS among the cricket players.

REFERENCES

1. Bullock GS, Collins GS, Peirce N, Arden NK, Filbay SR. Health-related quality of life and flourishing in current and former recreational and elite cricketers. Health Qual Life Outcomes. 2020a;18(1):41. doi: 10.1186/s12955-020-01301-7, PMID 32093738.
2. Bullock GS, Collins GS, Peirce N, Arden NK, Filbay SR. Playing sport injured is associated with osteoarthritis, joint pain and worse health-related quality of life: A cross-sectional study. BMC Musculoskelet Disord. 2020c;21(1):111. doi: 10.1186/s12891-020-3136-5, PMID 32075619.
3. Bullock GS, Collins G, Peirce N, Arden NK, Filbay SR. Physical activity and health-related quality of life in former elite and recreational cricketers from the UK with upper extremity or lower extremity persistent joint pain: A cross-sectional study. BMJ Open. 2019;9(11):e032606. doi: 10.1136/bmjopen-2019-032606, PMID 31719092.
4. Chairani A 2020. Validity and reliability test of the Nordic musculoskeletal Questionnaire with formal and informal sector workers. Childhood stunting, wasting, and obesity, as the critical global health issues: forging cross-sectoral solutions [preprint]. doi: 10.26911/the7thicph-FP.05.06.
5. Dennis RJ, Finch CF, Farhart PJ. Is bowling workload a risk factor for injury to Australian Junior Cricket Fast Bowlers? Br J Sports Med. 2005;39(11):843-6; discussion 843. doi: 10.1136/bjsm.2005.018515, PMID 16244195.
6. Musculoskeletal disorders. Contemp Ergon. 1998;1998:49-84. doi: 10.1201/9781482267952-8.
7. Dovbysh T, Reid D, Shackel D. Injury incidence within male elite New Zealand cricket from the early T20 era: 2009-2015. BMJ Open Sport Exerc Med. 2021;7(4):e001168. doi: 10.1136/bmjsem-2021-001168, PMID 34868632.
8. Dube A, D Gundani MP, Rastogi S. Musculoskeletal injuries among adolescent cricketers in Zimbabwe. MOJ Sportsmed. 2018;2(1):49-52. doi: 10.15406/mojsm.2018.02.00045.
9. Filbay SR, Bishop F, Peirce N, Jones ME, Arden NK. Common attributes in retired professional cricketers that may enhance or hinder quality of life after retirement: A qualitative study. BMJ Open. 2017;7(7). doi: 10.1136/bmjopen-2017-016541.
10. Filbay S, Pandya T, Thomas B, McKay C, Adams J, Arden N. Quality of life and life satisfaction in former athletes: A systematic review and meta-analysis. Sports Med. 2019;49(11):1723-38. doi: 10.1007/s40279-019-01163-0, PMID 31429036.
11. Hays RD, Sherbourne CD, Mazel RM. The RAND 36-Item Health Survey 1.0. Health Econ. 1993;2(3):217-27. doi: 10.1002/hec.4730020305, PMID 8275167.

12. Imagama S, Ando K, Kobayashi K, Seki T, Hamada T, Machino M et al. Shoulder pain has most impact on poor quality of life among various types of musculoskeletal pain in middle-aged and elderly people: Yakumo study. Mod Rheumatol. 2020;30(3):568-72. doi: 10.1080/14397595.2019.1623364, PMID 31132288.
13. Karimi M, Brazier J. Health, health-related quality of life, and quality of life: what is the difference? Pharmacoeconomics. 2016;34(7):645-9. doi: 10.1007/s40273-016-0389-9, PMID 26892973.
14. López-Aragón L, López-Liria R, Callejón-Ferre Á, Gómez-Galán M. Applications of the standardized Nordic questionnaire: a review. Sustainability. 2017;9(9):1514. doi: 10.3390/su9091514.
15. Marik TL, Roll SC. Effectiveness of occupational therapy interventions for musculoskeletal shoulder conditions: A systematic review. Am J Occup Ther. 2017;71(1):7101180020p1-7101180020p11. doi: 10.5014/ajot.2017.023127, PMID 28027039.
16. Mariscalco MW, Saluan P. Upper Extremity injuries in the adolescent athlete. Sports Med Arthrosc Rev. 2011;19(1):17-26. doi: 10.1097/JSA.0b013e31820d5680, PMID 21293234.
17. Mondam S, Shaik R, Prakash J, Fook JL, Nekkanti S. Surveillance of musculoskeletal symptoms and anthropometric variables among four international cricket teams competed in ACC Premier League Malaysia 2014. Asian J Pharm Res Health Care. 2016;8(2):47. doi: 10.18311/ajprhc/2016/750.
18. Noorbhai M, Essack F, Thwala S, Ellapen T, Van Heerden J. Prevalence of cricket-related musculoskeletal pain among adolescent cricketers in KwaZulu-Natal. S Afr J Sports Med. 2012;24(1). doi: 10.17159/2078-516X/2012/v24i1a352.
19. Raghavendra Rao M, Srinivasan TM, Kumar Itagi R. Epidemiology of annual musculoskeletal injuries among male cricket players in India. Indian J Community Health. 2020;32(3):590-3. doi: 10.47203/IJCH.2020.v32i03.023.
20. Roll SC, Hardison ME. Effectiveness of occupational therapy interventions for adults with musculoskeletal conditions of the forearm, wrist, and hand: A systematic review. Am J Occup Ther. 2017;71(1):7101180010p1-7101180010p12. doi: 10.5014/ajot.2017.023234, PMID 28027038.
21. Sauers EL, Dykstra DL, Bay RC, Bliven KH, Snyder AR. Upper Extremity Injury History, current pain rating, and health-related quality of life in female softball pitchers. J Sport Rehabil. 2011;20(1):100-14. doi: 10.1123/jsr.20.1.100, PMID 21411826.
22. Sochol KM, Charen DA, Kim J. Upper Extremity injuries in pediatric athletes. Ann Joint. 2018;3:41-. doi: 10.21037/aoj.2018.05.04.
23. Stuelcken MC, Ginn KA, Sinclair PJ. Musculoskeletal profile of the lumbar spine and hip regions in cricket fast bowlers. Phys Ther Sport. 2008;9(2):82-8. doi: 10.1016/j.ptsp.2008.02.002, PMID 19083707.
24. VanderZee KI, Sanderman R, Heyink JW, de Haes H. Psychometric qualities of the rand 36-item health survey 1.0: A multidimensional measure of general health status. Int J Behav Med. 1996;3(2):104-22. doi: 10.1207/s15327558ijbm0302_2, PMID 16250758.
25. Walker HL, Carr DJ, Chalmers DJ, Wilson CA. Injury to recreational and professional cricket players: circumstances, type and potential for intervention. Accid Anal Prev. 2010;42(6):2094-8. doi: 10.1016/j.aap.2010.06.022, PMID 20728667.
26. Zhu YX, Li T, Fan SR, Liu XP, Liang YH, Liu P. Health-related quality of life as measured with the short-form 36 (SF-36) questionnaire in patients with recurrent vulvovaginal candidiasis. Health Qual Life Outcomes. 2016;14(1):65. doi: 10.1186/s12955-016-0470-2, PMID 27129474.