INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

PREVALENCE OF COMMON MUSCULOSKELETAL CONDITIONS AND ITS EFFECT ON QUALITY OF LIFE AMONG NON-PROFESSIONAL TAEKWONDO ATHLETES OF PESHAWAR

Original Research

Mishal Waheed Awan[1]*
[1]Junior Physical Therapist, MMC General Hospital Peshawar, Pakistan.
Corresponding Author: Mishal Waheed Awan, Junior Physical Therapist, MMC General Hospital Peshawar, Pakistan. mishalawan588@gmail.com

Conflict of Interest: None
Grant Support & Financial Support: None

ABSTRACT

Background: Taekwondo, a traditional Korean martial art, combines intricate foot and hand techniques and is a prominent global sport. Practitioners often experience musculoskeletal conditions, such as back, knee, ankle, and shoulder pain, which are prevalent due to the physical demands of the sport.

Objective: The objective of this study was to assess the prevalence of injuries and their impact on the quality of life among non-professional Taekwondo athletes.

Methods: This cross-sectional descriptive study was conducted at the Peshawar Sports Complex and Hayatabad Sports Complex, Peshawar. A total of 126 Taekwondo trainees participated. Sample size was calculated using raosoft online software, with a 95% confidence level and a 5% margin of error. Data collection was performed through non-probability convenient sampling, with participants providing written or verbal consent and completing two questionnaires assessing injury incidence and quality of life (QOL).

Results: The study found a high prevalence of injuries, with 71.4% of participants reporting at least one injury in the past year. The most commonly injured areas were the neck (50.4%), knee (37.3%), and ankle (26.1%). Injuries significantly impacted physical functioning, bodily pain, and general health, with 70.9% of participants experiencing a slight reduction in QOL and 26% reporting significant limitations. The statistical analysis revealed a significant association between injuries and decreased QOL ($p < 0.05$).

Conclusion: The study highlights a significant prevalence of injuries among non-professional Taekwondo athletes, with substantial effects on their quality of life. These findings emphasize the need for improved preventive measures and injury management strategies within this athletic population.

Keywords: Athletic Injuries; Health Status; Martial Arts; Non-professional Athletes; Pain Measurement; Quality of Life; Taekwondo.

INTRODUCTION

Taekwondo, a traditional Korean martial art known for its dynamic full-body movements including head-level kicks, jumping turning kicks, and rapid kicking techniques, has evolved into a popular global sport and an official Olympic discipline. This sport requires intense physical engagement predominantly involving the shoulders and knees, which are subject to frequent use and, consequently, injuries. The prevalence of musculoskeletal conditions, such as shoulder and knee pain, significantly affects the quality of life of its practitioners. Statistics indicate an injury rate of 2.15 per 1,000 hours of training, with muscle injuries including strains and sprains being most common, accounting for 58.6% of all incidents (1, 2). These injuries predominantly affect the foot and fingers, with 18.9% of cases recorded in these areas.

Despite the physical benefits associated with Taekwondo, including improved agility and anaerobic capacity, it is considered one of the sports with the highest injury rates in Olympic competitions, consistently ranked among the top five for its injury severity (6-8). The rigorous physical demands often lead to joint injuries, fractures, and bruises, particularly to the hands and wrists. Moreover, the competitive aspect of Taekwondo exacerbates the risk, with ligament injuries and muscle tears being common, especially during contests (24-26). The injury surveillance by the Global Olympics Committee highlights the inherent risks associated with the sport, emphasizing the frequency and severity of injuries encountered (16).

To mitigate these risks, athletes often use protective gear like proper fitting ankle and knee protectors, which have proven beneficial in reducing the occurrence of sports injuries during matches (27-31). However, injuries remain prevalent and pose a significant challenge to athletes' long-term participation and health. Given the high incidence of musculoskeletal injuries and their impact on athletes' performance and quality of life, this study aims to examine the prevalence of common conditions among non-professional Taekwondo athletes in Peshawar and assess how these affect their overall quality of life. The objective is to provide a comprehensive overview of the physical challenges faced by these athletes and to offer insights into preventive measures that could enhance their safety and well-being in the sport.

METHODS

This cross-sectional study was conducted over a six-month period at Peshawar Sports Complex and Hayatabad Sports Complex in Peshawar, Pakistan, subsequent to the approval from the Institutional Review Board. The study commenced after the Ethical Review Committee of City University, Peshawar granted ethical clearance, and the respective sports complexes approved the data collection process. The sample comprised 126 participants, determined using the Rao Soft sample size calculator, which factored in an anticipated frequency of 9%, a confidence interval of 95%, and a margin of error of 5%. Participants, both male and female aged between 10 and 30 years, were recruited through convenient sampling from among non-professional Taekwondo trainees at the complexes (32, 33). Individuals who were professional Taekwondo athletes were excluded from the study. The data collection was conducted in the waiting rooms of the sports complexes, where participants were selected based on the inclusion criteria and subsequently interviewed face-to-face. Each participant was administered a quality-of-life questionnaire, designed to assess the impact of musculoskeletal injuries on their daily activities and overall well-being.

Prior to participation, both verbal and written consents were obtained from each participant, ensuring confidentiality of the responses. The statistical analysis was performed using IBM SPSS software, version 23. The quantitative data were presented as means and standard deviations, while qualitative data were expressed in frequencies and percentages. The correlations among variables were explored using parameter estimates from the ordinal regression model, and the association between categorical variables was analyzed through the Chi-square Test. Statistical significance was established at a p-value of less than 0.05, indicating a significant relationship between the studied variables (34, 35). The methodological approach, thereby, ensured a rigorous examination of the prevalence of musculoskeletal conditions among Taekwondo trainees and their subsequent effects on quality of life, adhering to stringent ethical and statistical standards to validate the findings.

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

RESULTS

In the study conducted at Peshawar Sports Complex and Hayatabad Sports Complex over a six-month period, 126 non-professional Taekwondo athletes, consisting of 72 males (57.1%) and 54 females (42.9%), participated. The gender distribution highlights a predominant male participation in this martial arts discipline.

Table 1: Gender Distribution and Prevalence of Injuries

Category	Subcategory	Frequency (%)
Gender Distribution	Male	72 (57.1%)
	Female	54 (42.9%)
	Total	126
Prevalence of Injuries	Neck (Yes)	64 (50.7%)
	Neck (No)	58 (46%)
	Shoulder (Yes)	46 (36.5%)
	Shoulder (No)	75 (59.5%)
	Elbow (Yes)	34 (26.9%)
	Elbow (No)	88 (69.8%)
	Wrist (Yes)	29 (23%)
	Wrist (No)	93 (73.8%)
	Knee (Yes)	47 (37.3%)
	Knee (No)	75 (59.5%)

The impact of injuries on the quality of life (QOL) was a significant focus of the study. Out of the 126 participants, 90 reported their quality of life as slightly limited due to injuries, while 32 experienced a substantial limitation. This suggests that the majority of injuries sustained led to moderate disruptions in daily living and activities (71.4% slightly limited, 25.4% fully limited).

In terms of the prevalence of injuries among the participants, the neck was the most commonly affected region, with 64 athletes (50.7%) reporting injuries in this area. This was followed by knee injuries, affecting 47 athletes (37.3%), and shoulder injuries, impacting 46 participants (36.5%). Injuries to the elbow, wrist, and ankle were also reported by 34 (26.9%), 29 (23%), and 33 (26.1%) of the participants, respectively. These findings indicate a high incidence of injuries across various body regions, underscoring the physical demands and risks associated with Taekwondo.

Table 2: Prevalence of Injuries Among Participants (N = 126)

Injury Region	Frequency (%)
Neck	64 (50.7%)
Shoulder	46 (36.5%)
Elbow	34 (26.9%)
Wrist	29 (23%)
Knee	47 (37.3%)
Ankle	33 (26.1%)

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

The detailed examination of how injuries affected participants' quality of life revealed that the majority of those with neck injuries experienced a marked reduction in their quality of life, with 48 out of 64 individuals affected. Similar trends were observed for other injuries: 31 out of 46 participants with shoulder injuries, 24 out of 34 with elbow injuries, 21 out of 29 with wrist injuries, 30 out of 47 with knee injuries, and 18 out of 33 with ankle injuries reported limited quality of life. These results demonstrate the significant impact injuries have on the well-being of Taekwondo practitioners.

Ordinal regression analysis was utilized to examine the relationship between specific injuries and the quality of life. The results indicated that neck and ankle injuries were not significant predictors of quality of life changes, suggesting that other factors might play a role in how injuries influence the overall well-being of athletes. Furthermore, the Pearson Chi-Square and Deviance Chi-Square tests confirmed the adequacy of the regression model, with p-values showing no significant deviations from the model, thus validating the fit of the data to the analysis conducted.

Table 3: Association between injuries and QOL

	ESTIMATE	P value
QOL=1	-19.855	.991
QOL=2	-1.102	.000
QOL=3	3.394	.000
NECK REGION=1	-35.981	.992
NECK REGION=2	-.047	.906

Table 4: Association between injuries and QOL

	ESTIMATE	P value
QOL=1	-19.197	.985
QOL=2	-1.518	.000
QOL=3	3.193	.000
ANKLE REGION=1	-34.325	.987
ANKLE REGION=2	-1.359	.002

These findings emphasize the need for enhanced preventive strategies and protective measures to mitigate the risk of injuries among Taekwondo athletes, aiming to preserve and possibly enhance their quality of life despite the rigorous demands of the sport.

DISCUSSION

This descriptive cross-sectional study, conducted at the Peshawar and Hayatabad sports complexes, aimed to investigate the prevalence of common musculoskeletal conditions and their impact on the quality of life among non-professional taekwondo athletes in Peshawar. A total of 126 participants were included in the study, revealing significant findings regarding the incidence of injuries and their effects on daily activities. Notably, 25.4% of participants experienced a severely limited quality of life, while 71.4% faced slight limitations. The study highlighted that injuries were most prevalent in the neck, knee, and shoulder regions, affecting 50.4%, 37.0%, and 36.2% of the athletes, respectively (10). Research by Kim et al. (2023) supports these findings, indicating a correlation between high training intensities and an increased risk of elbow injuries, which significantly impairs the athletes' ability to perform daily activities (20). Similarly, Feehan (2022) emphasized that taekwondo could be a source of debilitating injuries that might affect performance in competitions (36). Cheon & Park (2019) also reported high incidences of head blows and concussions during competitive matches, underscoring the risks involved in this sport (37). Conversely, Imagama et al. (2020) found that while lower extremities were commonly

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

injured, no injuries were reported in the neck, shoulder, spine, or trunk areas during a specific interuniversity taekwondo championship, highlighting that injury patterns might vary significantly across different levels and types of competition (38).

The study strongly suggests the development and implementation of sport-specific training programs focusing on strengthening and flexibility to mitigate the risk of musculoskeletal injuries. Collaborative efforts with physiotherapists and sports medicine professionals are recommended for routine assessments and developing effective injury prevention strategies. Furthermore, enhancing the quality of life for athletes with chronic injuries should include mental health support and lifestyle modifications. There is also a pressing need for research into innovative treatment methods and preventive measures tailored specifically to the needs of non-professional athletes. Despite these insights, the study's design as a cross-sectional analysis introduces limitations, primarily its focus on the prevalence of injuries without exploring potential associations with factors like gender or age. This gap underscores the need for longitudinal studies to understand better the causal relationships and long-term effects of taekwondo-related injuries on athletes' health and quality of life. Such studies could provide a more comprehensive understanding of the impact of demographic variables on injury risks and outcomes, thereby facilitating more targeted and effective interventions.

CONCLUSION

The findings of this study elucidate that injuries, predominantly in the neck and shoulder regions, are prevalent among non-professional taekwondo athletes in Peshawar, affecting a substantial portion of participants. These musculoskeletal conditions are associated with a noticeable degradation in the quality of life, with many athletes experiencing both slight and significant limitations in their daily activities. Despite these observations, the statistical analysis indicates that the presence of injuries does not significantly predict the overall quality of life, suggesting that other factors may also play critical roles in influencing the well-being of taekwondo practitioners. The study underscores the need for targeted preventive measures and interventions to mitigate the impact of such injuries and enhance the quality of life for those engaged in this demanding sport.

REFERENCES

1. Pieter W, Kazemi M, editors. Competition injuries in young Canadian Taekwondo athletes. The 1st International Symposium for Taekwondo Studies; 2007: Beijing, China.

2. Pieter W, Rostami M, Ziaee V. An addendum to injury rates in Iranian taekwondo athletes; a prospective study. Asian journal of sports medicine. 2010;1(2):117.

3. Fahmy VF, Momen MAMT, Mostafa NS, Elawady MY. Prevalence, risk factors and quality of life impact of work-related musculoskeletal disorders among school teachers in Cairo, Egypt. BMC Public Health. 2022;22(1):2257.

4. Zitko P, Bilbeny N, Balmaceda C, Abbott T, Carcamo C, Espinoza M. Prevalence, burden of disease, and lost in health state utilities attributable to chronic musculoskeletal disorders and pain in Chile. BMC public health. 2021;21:1-9.

5. Vega-Fernández G, Lera L, Leyton B, Cortés P, Lizana PA. Musculoskeletal disorders associated with quality of life and body composition in urban and rural public school teachers. Frontiers in Public Health. 2021;9:607318.

6. Ziaee V. Injury rates in Iranian taekwondo athletes; a pros. 2010.

7. Csonka V, Varjú C, Lendvay M. Diabetes mellitus-related musculoskeletal disorders: unveiling the cluster of diseases. Primary Care Diabetes. 2023.

8. Garcia JC, Cardoso AM. Athletic Injuries of the Elbow. Wrist and Elbow Arthroscopy with Selected Open Procedures: A Practical Surgical Guide to Techniques. 2022:873-88.

9. Lystad RP, Pollard H, Graham PL. Epidemiology of injuries in competition taekwondo: A meta-analysis of observational studies. Journal of Science and Medicine in Sport. 2009;12(6):614-21.

10. Muthelo L, Sinyegwe NF, Phukubye TA, Mbombi MO, Ntho TA, Mothiba TM, editors. Prevalence of work-related Musculoskeletal disorders and its effects amongst nurses in the selected intellectual disability unit of the Limpopo Province. Healthcare; 2023: MDPI.

11. Muthelo L, Sinyegwe N, Phukubye T, Mbombi M, Ntho T, Mothiba T. Prevalence of work-related Musculoskeletal disorders and its effects amongst nurses in the selected intellectual disability unit of the Limpopo Province. Healthcare. 2023; 11 (5): 777. 2023.

12. Jeong HS, Ha S, Jeong DH, O'sullivan DM, Lee SY. Injury and illness in world taekwondo junior athletes: An epidemiological study. International journal of environmental research and public health. 2021;18(4):2134.

13. Jeong HS, O'Sullivan DM, Jeong DH, Lee SY. Sports injuries and illnesses after implementation of the web-based surveillance system in world Taekwondo. Journal of Athletic Training. 2021;56(11):1232-8.

14. Jeong J. Association of scapular dyskinesis with neck and s. 2023.

15. Jeong JH, Kim YK. Association of Scapular Dyskinesis with Neck and Shoulder Function and Training Period in Brazilian Ju-Jitsu Athletes. Medicina. 2023;59(8):1481.

16. Safiri S, Kolahi AA, Cross M, Hill C, Smith E, Carson-Chahhoud K, et al. Prevalence, deaths, and disability-adjusted life years due to musculoskeletal disorders for 195 countries and territories 1990–2017. Arthritis & rheumatology. 2021;73(4):702-14.

17. Koh JO, Cassidy JD. Incidence study of head blows and concussions in competition taekwondo. Clinical Journal of Sport Medicine. 2004;14(2):72-9.

18. Altarriba-Bartes A. Epidemiology of injuries in elite taekwondo athlet. 2014.

19. Kim H. The effect of rapid weight loss on sports injury i. 2023.

20. Kim HC, Park KJ. The effect of rapid weight loss on sports injury in elite taekwondo athletes. The Physician and Sportsmedicine. 2023;51(4):313-9.

21. Kazemi M. Relationships between injury and success in elite Taekwondo athletes. Clinical Chiropractic. 2011;4(14):160-1.

22. Kazemi M. Relationships between injury and success in elite Taekwondo athletes. Journal of sports sciences. 2012;30(3):277-83.

23. Kazemi M, Ingar A, Jaffery A. Injuries in elite Taekwondo Poomsae athletes. The Journal of the Canadian Chiropractic Association. 2016;60(4):330.

24. Doo H, Kim D, Kim C, Lee SY, Park J. Comparisons of musculoskeletal injuries among three different modalities of Taekwondo (Kyorugi, Poomsae, and Shibum): a one-year follow-up prospective epidemiologic study. Research in Sports Medicine. 2023;31(5):528-43.

25. Gurau TV, Musat CL, Voinescu DC, Anghel L, Gurau G, Postelnicu MG, et al. Incidence and prevalence of injuries in some sports-review. Balneo & PRM Research Journal. 2023;14(4).

26. Gatt I. Effects of bandaging techniques and shot types on wrist motion in boxing: Sheffield Hallam University; 2023.

27. Jung J. Scapular dyskinesis in elite boxers with neck disa. 2021.

28. Jung JW, Kim YK. Scapular dyskinesis in elite boxers with neck disability and shoulder malfunction. Medicina. 2021;57(12):1347.

29. Junge A, Engebretsen L, Mountjoy ML, Alonso JM, Renström PA, Aubry MJ, et al. Sports injuries during the summer Olympic Games 2008. The American journal of sports medicine. 2009;37(11):2165-72.

30. Lenartowicz M, Dobrzycki A, Jasny M. 'Let's face it, it's not a healthy sport': Perceived health status and experience of injury among Polish professional mixed martial arts athletes. International Review for the Sociology of Sport. 2023;58(3):589-607.

31. Haftu D, Kerebih H, Terfe A. Prevalence of work-related musculoskeletal disorders and its associated factors among traditional cloth weavers in Chencha district, Gamo zone, Ethiopia, an ergonomic study. PLoS One. 2023;18(11):e0293542.

32. Cha Y, Park D. A survey of injuries and a comparative study of characteristics for each detailed sport of Taekwondo. International Journal of Martial Arts. 2021;6(3):1-11.

33. Bridge CA, Ferreira da Silva Santos J, Chaabene H, Pieter W, Franchini E. Physical and physiological profiles of taekwondo athletes. Sports Medicine. 2014;44:713-33.

34. Greggi C, Visconti VV, Albanese M, Gasperini B, Chiavoghilefu A, Prezioso C, et al. Work-Related Musculoskeletal Disorders: A Systematic Review and Meta-Analysis. Journal of Clinical Medicine. 2024;13(13):3964.

35. Corcoran D, Climstein M, Whitting J, Del Vecchio L. Impact Force and Velocities for Kicking Strikes in Combat Sports: A Literature Review. Sports. 2024;12(3):74.

36. Feehan M, Waller AE. Precompetition injury and subsequent tournament performance in full-contact taekwondo. British Journal of Sports Medicine. 1995;29(4):258-62.

37. Cheon W, Park J. Sports Injury Status Survey by Gender and Career of the Taekwondo Poomsae Athletes. International Journal of Martial Arts. 2022;7(2):1-9.

38. 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. Modern rheumatology. 2020;30(3):568-72.