



Survey on Knowledge and Use of Exercise Therapy for Lower Limb Injuries

Survei Pengetahuan dan Penggunaan Terapi Exercise pada Cedera Ekstremitas Bawah

Original Article

Aini Neisinda Saveti*

Department of Sports Science, Faculty of Sports Science and Health, Yogyakarta State University, INDONESIA

Ataka Levi Liandono

Department of Sports Science, Faculty of Sports Science and Health, Yogyakarta State University, INDONESIA

Shafiqah Ananda Putri

Department of Sports Science, Faculty of Sports Science and Health, Yogyakarta State University, INDONESIA

Dava Jigja Tahya Sinatrio

Department of Sports Science, Faculty of Sports Science and Health, Yogyakarta State University, INDONESIA

Hikmal Maulana

Department of Sports Science, Faculty of Sports Science and Health, Yogyakarta State University, INDONESIA

Enggista Hendriko Delano

Department of Sports Science, Faculty of Sports Science and Health, Yogyakarta State University, INDONESIA

Abstract.

Background

Lower limb injury is one of the types of injury most frequently experienced by sports students, and it can disrupt both academic and sporting activity. Exercise therapy is one of the rehabilitation methods that is effective for restoring movement function, increasing muscle strength, and lowering the risk of recurrent injury.

Objectives

This study aims to describe the level of knowledge and use of exercise therapy in the recovery from lower limb injury among sports students.

Methods

This study used a descriptive quantitative design with a survey method. The research sample comprised 38 sports students who had experienced a lower limb injury and who were selected using a purposive sampling technique. Data were collected through a questionnaire and analysed descriptively using mean values, standard deviation, frequency distribution, and percentages.

Results

The level of student knowledge regarding exercise therapy was in the high category, with a mean value of 4.01 (SD = 0.12), whereas the level of use of exercise therapy was also in the high category, with a mean value of 3.97 (SD = 0.11). The type of exercise therapy most widely used was strengthening exercise (97.4%).

Conclusion

Sports students have a high level of knowledge and use of exercise therapy in the recovery from lower limb injury, so that exercise therapy has become an important part of the injury rehabilitation process and may serve as a basis for the development of more effective injury education and rehabilitation programmes.

Keywords: exercise therapy, lower limb injury, knowledge, sports students

Received: July 17, 2026. Accepted: August 18, 2026

*Correspondence: AiniNeisinda.2024@student.uny.ac.id

Aini Neisinda Saveti

Department of Sports Science, Faculty of Sports Science and Health, Yogyakarta State University, INDONESIA

OPEN ACCESS



Copyright: © 2026 by the authors. Published by KHATEC, Indonesia. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (Creative Commons Attribution-ShareAlike 4.0 International License), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Sport is a physical activity that provides various benefits for health, physical fitness, and quality of life, and it is therefore recommended as part of a healthy lifestyle. Nevertheless, participation in sport is also accompanied by the risk of injury, which may cause pain, a decline in performance, and the loss of training and competition time, so that it becomes an important concern in the field of sports medicine and rehabilitation [7]. Among the various types of sports injury, lower limb injury is the injury location most frequently found, particularly in the ankle and knee joints [12]. Lower limb injury may cause limitation of the range of joint motion, a decline in muscle strength, and disturbance of functional ability, so that appropriate management is required in order that the individual can return to activity and sport optimally [1].

Sports students are a group that actively takes part in practical courses, training, and sporting activities, so that they carry a risk of experiencing injury while carrying out those activities. Research conducted by Nirmalasari et al. shows that injury to the *ankle* is the sports injury most frequently experienced by students who take part in sports activity units [9]. This condition shows that sports

injury is still a problem that may disrupt both academic activity and sporting activity if it is not managed appropriately [12]. Therefore, appropriate management is required from the early phase of injury through to the rehabilitation process, so that students can return to sporting activity optimally [1].

Exercise therapy is one of the main interventions in the rehabilitation of musculoskeletal injury, which aims to reduce pain, increase the range of joint motion, improve muscle strength, and restore the functional ability of the individual after an injury has been experienced [10]. Various forms of exercise therapy, such as stretching, muscle strengthening, balance training, and proprioceptive training, have been proven effective in accelerating the recovery process while also lowering the risk of recurrent injury, particularly in lower limb injury [15]. The success of exercise therapy is influenced not only by the type of exercise provided, but also by the accuracy of the programme, the training intensity, and the individual's consistency in carrying out the rehabilitation programme [3]. Based on various research results, exercise therapy contributes to improving the recovery process from lower limb injury through the improvement of movement function, the reduction of pain, and the increase of muscle strength and joint stability, so that it becomes one of the important components in an injury rehabilitation programme [3, 10].

The success of exercise therapy is determined not only by the type of exercise provided, but also by the individual's level of knowledge regarding the purpose, benefits, and principles of implementation, as well as by consistency in carrying out the rehabilitation programme [3]. Good knowledge enables a person to select the appropriate type of exercise, to perform the exercise with correct technique, and to understand the importance of carrying out the rehabilitation programme consistently [15, 16]. Adherence in carrying out an exercise therapy programme is one of the factors that influences the success of rehabilitation. Individuals with a high level of adherence to an exercise programme have a lower risk of injury than individuals with low adherence [14]. Therefore, an understanding of the level of knowledge and use of exercise therapy among sports students becomes important to establish, as a basis for supporting the success of rehabilitation from lower limb injury.

Various previous studies have discussed the effectiveness of exercise therapy in improving the rehabilitation process from lower limb injury and in reducing the risk of recurrent injury [10, 3]. Other research has also examined the level of knowledge regarding sports injury management among students and athletes [16]. Although the effectiveness of exercise therapy and knowledge regarding sports injury management have been widely reported, studies that simultaneously describe the level of knowledge and use of exercise therapy among sports students from various study programmes and higher education institutions in Indonesia are still limited. Therefore, this study aims to describe the level of knowledge and use of exercise therapy in the recovery from lower limb injury among sports students.

METHOD

Research Design

This study is a descriptive study with a quantitative approach, using a survey method. The survey method was used in order to obtain information from respondents through a questionnaire, so that the condition or phenomenon under investigation could be described systematically (Sugiyono, 2022). This study aims to describe the level of knowledge and use of exercise therapy in the recovery from lower limb injury among sports students.

Participant

The participants in this study were sports students who had experienced a lower limb injury.

Population and the methods of sampling Instrumentation

The research population consisted of active students from various sports-related study programmes. The research sample comprised 38 respondents, who were selected using a purposive sampling technique, that is, a technique for determining a sample based on particular criteria (Sugiyono, 2022). The criteria for respondents were that they were active students in the sports field and that they had experienced a lower limb injury.

Instrument

The research instrument was a questionnaire that was compiled by the researchers on the basis of a review of theory and scientific literature regarding exercise therapy in the rehabilitation of lower limb injury, and it was adjusted to the research objectives. The questionnaire consisted of two research

variables, namely knowledge of exercise therapy (10 items) and use of exercise therapy (10 items), and it was also equipped with questions regarding respondent characteristics and the type of exercise therapy used. The questionnaire was distributed to respondents online using Google Forms. The knowledge and use variables were measured using a five-point Likert scale, namely strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The question regarding the type of exercise therapy was presented in the form of a checklist covering stretching, strengthening, balance exercise, resistance band exercise, and hydrotherapy. The score for each variable was obtained from the sum of all statement item scores, and it was then categorised into five categories, namely very high, high, moderate, low, and very low, based on the criteria put forward by Azwar (2012).

Analysis plan

The research data were analysed using descriptive analysis with the assistance of Microsoft Excel. The score of each variable was calculated from the total score of all statement items, and it was then presented in the form of mean values and standard deviation (SD). Subsequently, the scores were categorised into five categories, namely very high, high, moderate, low, and very low, based on the criteria put forward by Azwar (2012). Data regarding the type of exercise therapy used by respondents were analysed using frequency distribution and percentages.

Manuscript can use the STROBE method for observational studies, SRQR for qualitative studies, PRISMA for reviews, CARE for case reports, CONSORT for clinical trials (**recommendations**).

RESULTS AND DISCUSSION

Results

Respondent Characteristics

Table 1. Respondent characteristics by gender

Gender	n	%
Male	23	60,5
Female	15	39,5
Total	38	100

Table 2. Respondent characteristics by age

Age (years)	n	%
17	1	2,6
18	1	2,6
19	14	36,8
20	16	42,1
21	5	13,2
24	1	2,6
Total	38	100

Based on Table 1, of a total of 38 respondents, 23 respondents (60.5%) were male and 15 respondents (39.5%) were female. Subsequently, Table 2 shows that the majority of respondents were aged 20 years, numbering 16 respondents (42.1%), followed by those aged 19 years, numbering 14 respondents (36.8%). Accordingly, the respondents in this study were dominated by sports students in the 19-20 year age range.

Sports Students' Knowledge of Exercise Therapy

Table 3. Level of knowledge of exercise therapy in the recovery from lower limb injury

Variable	Mean	SD	Category
Knowledge of Exercise Therapy	4.01	0,12	High

Based on Table 3, the level of respondents' knowledge regarding *exercise* therapy in the recovery from lower limb injury obtained a mean value of 4.01, with a standard deviation (SD) of 0.12. Based on the criteria of Azwar (2012), the respondents' level of knowledge is included in the high category.

Use of Exercise Therapy for Lower Limb Injury

Table 4. Level of use of exercise therapy in the recovery from lower limb injury

Variable	Mean	SD	Category
Use of exercise therapy for lower limb injury.	3,97	0,11	High

Based on Table 4, the level of use of exercise therapy in the recovery from lower limb injury obtained a mean value of 3.97, with a standard deviation (SD) of 0.11. Based on the criteria of Azwar (2012), the respondents' level of use of exercise therapy is included in the high category.

Types of Exercise Therapy Used by Students

Table 5. Types of exercise therapy used in the recovery from lower limb injury

Type of Exercise Therapy	Percentage (%)
Stretching	94,7%
Strengthening (muscle strengthening exercise)	97,4%
Balance exercise	86,8%
Resistance band exercise	81,6%
Hydrotherapy (exercise in water)	57,9%

Respondents were able to select more than one type of exercise therapy, so that the total percentage does not amount to 100%.

Based on Table 5, the type of exercise therapy most widely used by respondents was strengthening exercise (muscle strengthening exercise), namely by 37 respondents (97.4%), followed by stretching, by 36 respondents (94.7%), balance exercise, by 33 respondents (86.8%), and resistance band exercise, by 31 respondents (81.6%). Meanwhile, hydrotherapy was the type of therapy least used, namely by 22 respondents (57.9%).

Discussion

The research results show that the level of knowledge of sports students regarding exercise therapy in the recovery from lower limb injury is in the high category, with a mean value of 4.01. These findings show that most respondents already have a good understanding of the basic concepts of exercise therapy, including its purpose, benefits, and role in the injury rehabilitation process. Education in the field of musculoskeletal rehabilitation is known to be able to improve students' acquisition of knowledge and understanding regarding the principles of rehabilitation and the application of exercise in the injury recovery process [6]. The results of this study are also consistent with previous research, which showed that Physical Education students have a good level of knowledge regarding sports injury management [16].

This study also shows that the level of use of exercise therapy in the recovery from lower limb injury is in the high category, with a mean value of 3.97. These findings indicate that most respondents have applied various forms of exercise therapy as part of the recovery process from the injury experienced. Exercise therapy is the main component of active rehabilitation, which aims to reduce pain, increase the range of joint motion, improve muscle strength, and restore the functional ability of the individual, so that they can return to activity optimally [4]. A rehabilitation programme that applies exercise therapy has also been proven able to increase the range of joint motion and to reduce pain in chronic ankle injury [10].

Based on the type of exercise therapy used, strengthening exercise was the method most widely selected by respondents, followed by stretching, balance exercise, and resistance band exercise, whereas hydrotherapy was the method least used. These findings show that there is variation in the use of exercise therapy among sports students in the process of rehabilitation from lower limb injury. The high level of use of strengthening exercise shows that strengthening exercise is one of the forms of exercise therapy widely applied by respondents in the process of rehabilitation from lower limb injury. Strengthening exercise is one of the main components in sports injury rehabilitation, because it plays a role in increasing muscle strength, improving joint stability, and preparing the individual to return to activity and sport optimally [4]. In addition, neuromuscular training is known to be able to help lower the risk of sports injury among individuals who are active in sport [3].

Stretching and balance exercise were also used by most respondents in this study. The use of these two types of exercise shows that exercises related to flexibility and stability were also applied in the process of rehabilitation from lower limb injury. Stretching is known to play a role in increasing flexibility and maintaining the range of joint motion, so that it can support the recovery process in sports injury [5]. Exercise therapy that aims to increase stability and to restore function is an important part of the rehabilitation of recurrent ankle injury [15].

The use of resistance band exercise by most respondents shows that resistance exercise also becomes one of the options in the injury rehabilitation process. Gradual resistance exercise is one of the important principles in sports injury rehabilitation, because it enables the training load to be increased progressively in accordance with the condition of the individual who has experienced the injury [4].

Hydrotherapy was the type of exercise therapy least used by respondents in this study. These findings show that the application of hydrotherapy among sports students is still not as common as other forms of exercise therapy. Nevertheless, the results of this study show that hydrotherapy is still used by some respondents as one of the alternatives in the process of rehabilitation from lower limb injury. This study did not examine the factors that influence the selection of the type of exercise therapy, so that the cause of the low use of hydrotherapy cannot yet be explained empirically and requires further study in subsequent research.

Implications

The research results show that sports students have a high level of knowledge and use of *exercise* therapy for lower limb injury. This shows that most students have understood the importance of *exercise* therapy and have applied it in the injury recovery process. Therefore, the results of this study may serve as input for study programmes in improving learning regarding injury prevention and sports rehabilitation, both through lectures and through practical activities, so that students have better understanding and skills in the management of sports injury.

Research contribution

This study provides a picture of the level of knowledge and use of *exercise* therapy among sports students who have experienced a lower limb injury. In addition, this study also shows that *strengthening exercise* is the type of therapy most widely used, followed by *stretching*, *balance exercise*, and *resistance band exercise*. The results of this study are expected to serve as initial information and as reference material for subsequent research related to sports injury rehabilitation.

Limitations

This study used a descriptive survey approach, so that it only provides a picture of the level of knowledge and use of *exercise* therapy, without examining cause-and-effect relationships between variables [11]. In addition, the number of respondents in this study was still limited, and the data were obtained through an online questionnaire that was completed independently by respondents, so that the answers given depend on the understanding and honesty of each respondent. This study also did not examine the factors that influence the selection of the type of *exercise* therapy, nor the effectiveness of each therapy in supporting the injury recovery process.

Suggestions

It is recommended that subsequent research involve a larger and more diverse number of respondents, so that the research results can provide a broader picture. In addition, subsequent research may examine the relationship between the level of knowledge and the use of *exercise* therapy, and may investigate the factors that influence the selection of the type of *exercise* therapy in the recovery from lower limb injury.

CONCLUSION

Based on the research results, it can be concluded that the level of knowledge of sports students regarding exercise therapy in the recovery from lower limb injury is in the high category, with a mean value of 4.01. In addition, the level of use of exercise therapy is also in the high category, with a mean value of 3.97. These results show that most students not only understand the importance of exercise therapy, but have also applied it as part of the rehabilitation process from lower limb injury. The type of exercise therapy most widely used is strengthening exercise, followed by stretching, balance exercise,

and resistance band exercise, whereas hydrotherapy is the method least applied. Overall, this study shows that sports students have good knowledge and practice in the use of exercise therapy, so that this may serve as important capital in supporting the process of rehabilitation from lower limb injury optimally. Nevertheless, it is recommended that subsequent research examine the relationship between the level of knowledge and the effectiveness of the use of exercise therapy in relation to the success of injury recovery, and that a larger number of respondents be involved, so that the research results are more representative.

ACKNOWLEDGMENT

The authors would like to thank the Sports Science Study Programme, Faculty of Sports Science and Health, Yogyakarta State University, for the support provided during the conduct of the research. The authors also thank the supervising lecturers for their guidance and input during the process of preparing the research, and all sports students who were willing to become respondents in this study.

AUTHOR CONTRIBUTION STATEMENT

All authors contributed to this study.

CONFLICT OF INTEREST AND FUNDING

There is no conflict of interest

REFERENCES

- [1] S. Afifatuzzahra, T. B. Santoso, and I. F. Muhammad, "Manajemen fisioterapi terhadap kasus lateral ankle sprain akut pada atlet sepak bola U-20: A case report," *Future Academia: The Journal of Multidisciplinary Research on Scientific and Advanced*, vol. 3, no. 2, pp. 733–739, 2025, <https://doi.org/10.61579/future.v3i2.468>.
- [2] S. Azwar, *Penyusunan Skala Psikologi*, 2nd ed. Yogyakarta, Indonesia: Pustaka Pelajar, 2012. <https://www.scribd.com/document/760464992/Azwar-2012-Penyusunan-Skala-Psikologi-Edisi-2-Saifuddin-Azwar>
- [3] J. Dewantara, A. Widodo, and P. B. Dafun Jr., "The effect of neuromuscular training on reducing the risk of sports injuries: A systematic review," *Journal of Exercise Therapy and Rehabilitation*, vol. 1, no. 1, pp. 31–38, 2025. <https://journals.khatec.id/index.php/khater/article/view/12>
- [4] H. Dhillon, S. Dhillon, and M. S. Dhillon, "Current concepts in sports injury rehabilitation," *Indian Journal of Orthopaedics*, vol. 51, no. 5, pp. 529–536, 2017. https://doi.org/10.4103/ortho.IJOrtho_226_17
- [5] F. Ihsan et al., "The effect of stretching techniques on flexibility and sports injuries: A literature review," *Jurnal Olahraga Prestasi*, vol. 19, no. 3, pp. 220–230, 2023. <https://doi.org/10.21831/jorpres.v19i3.70745>
- [6] Y. Jin, L. Ma, J. Zhou, B. Xiong, A. Fernando, and H. Snelgrove, "A call for improving musculoskeletal education on physical medicine and rehabilitation studies: A systematic review with meta-analysis," *BMC Medical Education*, vol. 24, Art. no. 1163, 2024, <https://doi.org/10.1186/s12909-024-06178-4>.
- [7] J. B. Lauersen, D. M. Bertelsen, and L. B. Andersen, "The effectiveness of exercise interventions to prevent sports injuries: A systematic review and meta-analysis of randomised controlled trials," *British Journal of Sports Medicine*, vol. 48, no. 11, pp. 871–877, 2014. <https://doi.org/10.1136/bjsports-2013-092538>

- [8] C. Ley and P. Putz, "Efficacy of interventions and techniques on adherence to physiotherapy in adults: An overview of systematic reviews and panoramic meta-analysis," *Systematic Reviews*, vol. 13, Art. no. 137, 2024. <https://doi.org/10.1186/s13643-024-02538-9>
- [9] N. Nirmalasari, M. Nofiyanto, and R. W. Hidayati, "Studi demografi: Riwayat kejadian cedera dan penanganan pertama cedera olahraga di unit kegiatan mahasiswa," *Journal of Health Studies*, vol. 4, no. 2, pp. 38–44, 2020. <https://doi.org/10.31101/jhes.1018>
- [10] Y. A. Saputro, P. E. Juntara, and A. T. Wibowo, "The effect of injury rehabilitation therapy program on the successful recovery of chronic ankle injury," *Medikora*, vol. 21, no. 2, pp. 121–129, 2022. <https://share.google/YLbQfrPLfraFFpNuR>
- [11] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*, 2nd ed. Bandung, Indonesia: Alfabeta, 2022. <https://www.scribd.com/document/691644831/Metode-Penelitian-2022-SUGIYONO>
- [12] K. D. R. S. Tanidi, O. Andiana, A. Abdullah, and M. Yunus, "Gambaran pengetahuan dan sikap atlet bola basket tentang cedera ekstremitas bawah (Studi kasus: Klub Basket Imonoke Fakultas Ekonomi dan Bisnis Universitas Negeri Malang)," *Sport Science and Health*, vol. 5, no. 8, pp. 864–872, 2023, <https://doi.org/10.17977/um062v5i82023p864-872>.
- [13] E. Verhagen et al., "International Olympic Committee consensus statement: Methods for recording and reporting epidemiological data on injury and illness in sport 2020 (including STROBE Extension for Sport Injury and Illness Surveillance (STROBE-SIIS))," *British Journal of Sports Medicine*, vol. 54, no. 7, pp. 372–389, 2020. <https://doi.org/10.1136/bjsports-2019-101969>
- [14] J. Viiala, P. Čech, P. Bakalár, A. Paravlic, P. Ružbarský, J. Sučka, K. Toivo, J. Parkkari, and M. Leppänen, "Effect of adherence to exercise-based injury prevention programmes on the risk of sports injuries: A systematic review and meta-analysis of randomised controlled trials," *Injury Prevention*, vol. 32, no. 1, pp. 31–40, 2026, <https://doi.org/10.1136/ip-2025-045632>.
- [15] A. Wiharja and S. Nilawati, "Terapi latihan fisik sebagai tata laksana cedera sprain pergelangan kaki berulang: Laporan kasus," *Jurnal Olahraga Prestasi*, vol. 14, no. 2, pp. 137–145, 2018. <https://doi.org/10.21831/jorpres.v14i2.23824>
- [16] M. S. Hidayatullah, M. F. Rahmi, A. Aldino, and S. Raibowo, "The level of student knowledge regarding the treatment of sports injuries using the R.I.C.E method," *Indonesian Journal of Sport, Health and Physical Education Sciences*, vol. 2, no. 1, pp. 14–21, 2024. <https://doi.org/10.58723/inasport.v2i1.148>