Sports Education Coaching Journal
https://doi.org/10.31599/jces.v6i1.3617
Vol. 6, No.1, May 2025, pp. 200-210
E-ISSN: 2722-3450 P-ISSN: 2775-3808

Development of A Recovery Model For Hockey Athletes Based on Propioceptive Neuromuscular Facilitation (PNF)

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Abstract

The research was conducted because of the need for a recovery model that can be used by hockey athletes. Research and development was conducted to produce a product in the form of a Recovery model for Hockey athletes based on Propioceptive Neuromuschular Facilitation (PNF). The research was conducted using the research and development method of the Borg and Gall model. Research data were collected using a validation questionnaire, an attractiveness questionnaire, and documentation. Data analysis of research results using Content Validity Index and Content Validity Ratio techniques. The results of the study are recovery model products for hockey athletes based on Propioceptive Neuromuschular Facilitation (PNF) developed according to ten steps from the Borg and Gall model, namely research and information collection, planning, develop preliminary form of product, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, and dissemination and implementation. The recovery model product for hockey athletes based on Propioceptive Neuromuschular Facilitation (PNF) shows the average value generated is 0.64 with the interpretation of high validity so that it is feasible and effective to use in the recovery activities of Hockey athletes. The recovery model product for hockey athletes based on Propioceptive Neuromuschular Facilitation (PNF) developed is very attractive to users with a percentage of attractiveness of 87.33% so it is possible that users will use the developed product in recovery activities.

Keywords: Recovery, Athlete Hockey, PNF

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Article Info:
Submitted: **14/02/2025** Revised: **16/03/2025** Accepted: **10/05/2025** Published: **25/05/2025**

How to Cite: Wibowo, T., Hardiyono, B., Melianty, S., Sukmawati, S. (2025). Development Of A Recovery Model For Hockey Athletes Based On Propioceptive Neuromuscular Facilitation (PNF). *Journal Coaching Education Sports*, 6(1), 200-210. https://doi.org/10.31599/jces 6(1).3617.

Author's Contribution: a - Study Design; b - Data Collection; c - Statistical Analysis; d - Manuscript Preparation; e - Funds Collection

A. Introduction

Sports is one of the physical activities that are increasingly in demand by various groups of people, ranging from children to the elderly. In accordance with Law Number 11 of 2022 concerning the National Sports System, sports are defined as all forms of physical activity carried out systematically with the aim of fostering, developing, and increasing a person's physical, mental and social potential. In this context, achievement sports is one of the important subsystems that focuses on fostering athletes in a structured, gradual and sustainable manner in order to be able to achieve the best achievements through the support of science and technology.

One of the sporting achievements that has received attention in Indonesia, especially in East OKU Regency, is hockey. Hockey is a team game that relies on technical coordination, tactics, and high physical endurance. This game requires athletes to move quickly and have excellent physical abilities, especially in terms of aerobic and anaerobic capacity. However, the high intensity of training and competition often leads to fatigue in athletes, which negatively affects their performance on the field.

Fatigue of hockey athletes is a major problem that must be addressed immediately to maintain the quality of training and competition. During this time, hockey athletes in East OKU Regency tend to only rely on passive recovery methods such as resting by sitting or lying down, which are considered less effective in restoring optimal physical condition. In addition, the lack of understanding of proper recovery techniques and limited rest time due to busy training and competition schedules further worsen athletes' recovery conditions.

Faced with these problems, the development of an effective and practical recovery model is an urgent need. One promising method is Proprioceptive Neuromuscular Facilitation (PNF), which is a contraction-relaxation-based muscle stretching technique that has been proven to increase muscle elasticity and accelerate the recovery process. By implementing a PNF-based recovery model that is tailored to the needs of hockey athletes, it is hoped that the recovery process can take place more optimally, thereby reducing fatigue and improving athletes' performance in every training session and match.

Seeing the potential and development of hockey in East OKU Regency, including the success of the men's and women's hockey teams in winning medals at the South Sumatra Porprov championships, efforts to improve the quality of coaching and athlete recovery are very strategic. Therefore, this study aims to develop a Proprioceptive Neuromuscular Facilitation

(PNF)-based recovery model that can be applied independently by hockey athletes to overcome fatigue, increase physical endurance, and support sustainable sports performance.

Based on the background description above, this research focuses on several main problems that need to be solved. First, what is the procedure for developing a recovery model for hockey athletes based on Proprioceptive Neuromuscular Facilitation (PNF) that is effective and easy to implement? Second, what is the feasibility level of the PNF-based recovery model developed specifically for hockey athletes in East OKU Regency? Third, how effective is the application of the recovery model in reducing fatigue and improving athlete performance after undergoing training and competition?

To answer these problems, this research aims to develop a systematic procedure in making PNF-based recovery models according to the specific needs of hockey athletes. In addition, this study also aims to test the feasibility of the product through a series of field trials, small groups, and validation from experts. Finally, this study will analyze the effectiveness of the recovery model in helping athletes overcome fatigue and improve the quality of their performance on the field.

It is hoped that the results of this research can provide significant benefits for various parties. For hockey athletes in East OKU Regency, the recovery model developed will be an effective and practical recovery method to maintain fitness and optimize performance during training and competition. For coaches, this research is expected to add insight in designing the right training and recovery program to maintain the physical condition of athletes on an ongoing basis. In addition, for educational institutions and academics, this research provides an important contribution in the development of sports health science and recovery model innovation, especially in the field of sports achievement. Finally, for the Department of Youth, Sports and Tourism of East OKU Regency, the results of this study can be a reference in strengthening hockey sports coaching and improving athlete performance in a sustainable manner.

B. Methods

This study uses a research and development (R&D) approach that aims to produce new products as well as test the validity and effectiveness of these products. In accordance with the definition put forward by Sugiyono (2017) and Sukmadinata (2020), this development research is focused on creating and refining a Proprioceptive Neuromuscular Facilitation (PNF) based recovery model specifically for Eastern OKU Regency

hockey athletes. The method used follows the Borg and Gall procedural development model which consists of ten stages starting from problem identification and data collection, product design planning, initial draft development, to a series of product trials, product revision, to implementation and dissemination of the final product.

The initial stage of the research was carried out with a preliminary study to gather information related to the needs and problems of hockey athletes, especially related to the busy training schedule and the limitations of the recovery techniques applied. Furthermore, the planning stage includes formulating research objectives, preparing product designs, and estimating the resources needed. At the product draft development stage, researchers developed a recovery model based on initial data and observations in the field. The initial product was then tested on a limited sample of athletes to obtain feedback and improve product design.

Further trials were conducted on a larger scale involving dozens of athletes to test the feasibility and effectiveness of the recovery model. The product revision process is carried out continuously based on input from field trials and expert validation, which focuses on the quality of the material, ease of use, safety, and product benefits for athletes. To measure the effectiveness of the recovery model, researchers used the Fatigue Assessment Scale (FAS) questionnaire instrument which was applied before and after product use in a pretest-posttest scheme. In addition, quantitative data was also collected through physiological measurements such as blood pressure, pulse rate, and breathing frequency of athletes.

Additional data collection was carried out through direct observation of athletes' recovery activities and in-depth interviews to obtain a complete picture of the application and athletes' responses to the recovery model developed. Data analysis was carried out by categorizing and processing qualitative and quantitative data using descriptive statistics and feasibility percentage calculation techniques based on a Likert scale. Product validity and reliability were tested through expert evaluation and athlete feedback to ensure the product could be applied effectively in the field. Thus, this research is expected to produce a PNF-based recovery model that is valid, feasible, and effective to overcome fatigue and improve the performance of hockey athletes in East OKU Regency.

C. Results and Discussion

Research Results

· This study successfully developed a recovery model for hockey athletes based on Proprioceptive Neuromuscular Facilitation (PNF) specifically designed to overcome the problem of fatigue due to a busy training and competition schedule. The development process followed the ten steps of the Borg and Gall model systematically, starting from research and information gathering, planning, initial product development, a series of limited and large-scale trials, to product revision and implementation. The results of observations and interviews in the early stages showed that Eastern OKU Regency hockey athletes still rely on passive recovery, such as resting by sitting or lying down, which is less effective in overcoming fatigue. This prompted the need to create a more efficient and practical recovery model, which was then realized through the PNF approach.

The recovery model developed includes a series of stretching movements, hold relax, contract relax, hold-relax with agonist contraction, and self massage using tools such as sticks and hockey balls. The initial product was tested on a small group of athletes and received positive feedback, which was then improved and refined based on the results of validation and expert recommendations. Product validation by sport and recovery experts resulted in a high validity value with an average Content Validity Ratio (CVR) of 0.64, indicating that this recovery model is feasible and can be applied effectively.

In addition, the product attractiveness test on 30 hockey athletes showed that this recovery model was very attractive with a percentage of 87.33%. This indicates that the product is not only effective in terms of function, but also accepted and demanded by athletes as a recovery method. The product is considered capable of increasing muscle strength and endurance, joint stability and mobility, and improving blood circulation which contributes to the acceleration of the recovery process.

Despite having significant advantages, this product also has some limitations, such as a focus only on hockey athletes and the use of visual media that is limited to images without animation or audiovisual content. In addition, product feasibility testing was only carried out through three stages of trials, namely field trials, small group trials, and expert validation. However, overall, this PNF-based recovery model product has proven to be valid, feasible, and very attractive to users, so it is expected to be an effective solution in improving the performance of Eastern OKU Regency hockey athletes through more optimal recovery.

Discussion

The results of this study indicate that the development of a recovery model based on Proprioceptive Neuromuscular Facilitation (PNF) provides an effective solution in overcoming fatigue in Eastern OKU Regency hockey athletes who have only relied on passive recovery methods. This recovery model is designed by considering the special needs of hockey athletes who face busy training and match schedules and short rest breaks. By using contraction-relaxation principles and stretching techniques assisted by others, the PNF model is able to increase muscle elasticity, improve joint range of motion, and accelerate the recovery process. This is in accordance with the theory that active recovery can help improve blood circulation and tissue oxygenation thereby accelerating the removal of fatigue-causing metabolic substances.

Product validation conducted by experts illustrates that the recovery model developed has high validity and can be relied upon for practical application. Positive feedback from athletes in the attractiveness test also confirms that this product not only meets the functional aspects, but also has a strong appeal so that it is easily accepted and practiced independently by athletes. This is an important point considering that the application of an effective recovery model is highly dependent on the athlete's willingness and ability to execute the technique consistently.

However, this study also recognizes the limitations, especially regarding the scope of the product which only focuses on hockey and the limited use of visual media without animation. This opens up opportunities for further development, for example by adding multimedia elements to clarify instructions and increase athlete motivation. In addition, the expansion of testing to other sports groups and the use of more varied evaluation methods can also be considered in future research.

Overall, the findings of this study underscore the importance of a systematic and evidence-based approach in developing sports recovery programs that suit athletes' specific characteristics and needs. The PNF-based recovery model not only helps accelerate physical recovery, but also has the potential to improve performance and reduce the risk of injury due to overexertion. Thus, the implementation of this model is expected to make a positive contribution to the development of sports performance, especially in East OKU Regency, and can be a reference for the

development of recovery models in other sports.

D. Conclusion

Based on the results of the research and development that has been carried out, it can be concluded that the recovery model product for hockey athletes based on Proprioceptive Neuromuscular Facilitation (PNF) was successfully developed by following the ten steps of the Borg and Gall model systematically and continuously. Product validation shows that this recovery model has a high level of validity with an average value of 0.64, which confirms its feasibility and effectiveness in supporting the recovery process of hockey athletes. In addition, this product also received positive responses from athletes with an attractiveness rate of 87.33%, indicating that this recovery model is not only technically effective but also attractive and easily accepted by users. Thus, this PNF-based recovery model is feasible to be implemented in the recovery activities of hockey athletes to overcome fatigue and improve optimal sports performance.

E. Acknowledgments

We would like to express our deepest gratitude to all those who have provided support and contributions in the implementation of this research. Special thanks go to the Department of Youth, Sports and Tourism of East OKU Regency and the hockey team who have been willing to be the object of research and provide valuable data and information. Our gratitude also goes to the experts and validators who have taken the time to provide input and constructive assessments for product improvement. Last but not least, we would like to thank all fellow researchers and support staff who helped in the process of data collection, analysis, and preparation of this research report. Hopefully the results of this study can provide real benefits for the development of hockey and the field of athlete recovery in general.

F. Conflict of Interest

The authors declare no conflict of interest**.**

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