International Journal of Health Science & Medical

Vol. 2 No. 2 (2023): August

DEVELOPMENT OF LOW IMPACT AEROBIC GYMNASTICS AS AN EFFORT TO PREVENT RHEUMATIC DISEASES IN MOLOTABU VILLAGE

Ucok Hasian Refiater[1], Arief Ibnu Haryanto[2]
[1,2]Sports Coaching Education Study Program, Gorontalo State University, Indonesia
email: arief_haryanto@ung.ac.id

Abstract

Aerobics is a series of exercises performed for a while to the rhythm of the music. This study aims to develop a low-impact aerobic workout for preventing rheumatic diseases. The initial model for this development was the development of low-impact gymnastics for the elderly Akbid Bina Husada. This research is research and development. Due to the development and implementation of the research procedures in this study, the research procedures were adjusted as follows: Literature research and information gathering; product design; design validation; design revision; product manufacturing; Here are the testers: Material expert tester. Media professionals; product trial topics and usage; The research tool for this development study is a questionnaire adapted from Trisnanda's research in 2018. The data analysis method in this development study uses a descriptive analysis method expressed as a percentage. As a result, evaluation in this study showed that the criteria could be performed very well. Conclusion of this development study is that the resulting product can be used to prevent rheumatic disease

Keywords: Aerobics; Control; Disease; Rheumatic.

Received : June 4th, 2023; 1st Revised June 13th, 2023; 2nd Revised July 3rd, 2023
Accepted For Publication : July 19th, 2023

1. INTRODUCTION

Gymnastics is a sport where physical activity with movements prioritizes flexibility, either with or without music (1). In addition to health, gymnastics is also contested under the auspices of FIG (Federation Internationale de Gymnastique) (2). There are six types of gymnastics; 1) General Gymnastics, 2) Artistic, 3) Rhythmic Gymnastics, 4) Trampoline, 5) Aerobics, and 6) Acrobatic.

Arthritis or often called rheumatism (rheumatoid arthritis), is a disease that attacks the joints and surrounding structures (3). Society often considers rheumatism a mild illness because it does not cause death. Still, if not treated quickly, rheumatism can cause abnormal limb functions such as lumps, stiff joints, difficulty walking, and lifelong disability (4). The pain that arises can be bothersome and limit daily activities. The synovial part of the joint, tendon sheath, and bursa will experience thickening due to inflammation, followed by bone erosion and destruction of the bone around the joint. The impact of rheumatoid arthritis patients can cause discomfort, which is caused by the effects of limited physical mobilization, can also cause disability such as paralysis and disruption of activities of daily living but also systemic effects that are not clear but can cause organ failure and death or result in problems such as pain, fatigue, changes in self-image and a high risk of injury (5).

The resulting pain can be very bothersome and limit daily activities. Due to inflammation, the synovial part of the joint, tendon sheath, and bursa thicken, followed by bone erosion and destruction of the bone around the joint. Consequences in patients with rheumatoid arthritis can cause discomfort due to limited physical mobility, can also cause disabilities such as paralysis and interference with daily activities, as well as systemic effects that are not clear but can lead to or cause organ failure and death or result in problems such as pain, fatigue, changes in self-image, and a high risk of injury (5). This disease can cause problems in everyday life.

Aerobics is a series of movements performed to the rhythm of music over a while (6) (7). Aerobics comes from the word "air," which means oxygen, so this aerobic exercise can be interpreted using oxygen (8) (9). In general, most people do aerobics with the primary goal of losing weight. Aerobic exercise has many other benefits that naturally have a positive effect on the health of the body, one of which is joint health (10). Variations of aerobic exercise, one of which is rheumatic gymnastics, can help maintain joint health. Even the application of rheumatic gymnastics can reduce the pain of patients (scale 8 (0-10) to 6 (0-10) (11). Of course, it can help prevent rheumatic diseases.

Molotabu Village is located in the Kabila Bone Subdivision of the Bone Bolango

Government in Gorontalo Province. Molotabu village is one of the villages on the coast of Tomin Bay. According to the Basic Health Survey (Riskesdas), in 2018, the Bone Bolango area itself, which includes Molotabu village, suffers from several common diseases, including osteoarthritis, high uric acid pain/acute and chronic hyperuricemia, and rheumatoid arthritis (rheumatism) as much as up to 1,054 people over the age of 14 at risk (Riskesdas Gorontalo, 2018). Of course, this is nothing to brag about, considering that Gorontalo District has the third highest number of people suffering from this common disease, and it can grow if society ignores it. Observing this, it is necessary to anticipate that this will only happen temporarily. In this case, the solution is aerobic exercise, which aims to prevent rheumatoid arthritis based on multimedia for residents of Molotabu Village, Kabila Bone District, Bone Bolango Regency, Gorontalo Province. In this case, multimedia uses a video that can be watched anytime via Youtube. This is also an advantage, as it is available at any time according to the wishes of the person concerned and the broader community.

2. METHODS

This study is a Research and Development design, which takes place through the manufactured products' design, production, and validity evaluation. The application of development and research methods in this study adapted the research phases as follows: problem research; literature review and data collection; product design; design validation; design review; manufacturing products; limited trial; product version 1; major field studies; product version 2; final product. Concerning the subjects, namely: expertise, media specialists, and topics and use of products. In this development study, the data collection tool was the use of a questionnaire with the answers "Strongly agree," "Agree," "Disagree," and "Strongly agree."

The information obtained from the test activity is classified into quantitative and qualitative data. Quantitative information in the form of ratings is collected through questionnaires or questionnaires (12). Qualitative input in the form of suggestions from material experts, media, and students has been compiled to improve this product. The data analysis technique used in this development study used the descriptive analysis technique expressed in percentages; the data in the form of proposals and corresponding selection criteria were analyzed through qualitative analysis. The measurement scale used to calculate quantitative data uses a Likert scale.

Table 1. Scale Classification

Achievement Percentage	Interpretation
76 - 100 %	Perfect fit
51 - 75 %	In accordance
26 - 50 %	Inappropriate
0 - 25%	Very Inappropriate

3. RESULTS AND DISCUSSION

Results

Material Expert Validation Data. The results of material validation were obtained through a questionnaire covering the material content. Before filling out the questionnaire provided by the researcher, the material expert first studied the video of low-impact aerobic exercise to prevent rheumatism accompanied by the researcher. The material expert validation process asks about the learning media to be developed. Material Expert Assessment is carried out through 2 stages, namely:

Table 2. Material Experts Evaluation of Level 1

No	Aspect	Assessment				Comment
		A	D	SD	?	
1.	The material chosen and presented follows the basic theory of aerobic exercise.		√			
2.	The material presented has the aim of preventing rheumatism.	√				
3.	The material presented can already be used to prevent rheumatism.	√				
4.	The images presented are by aerobic exercise techniques.		√			
5.	The created images are a study table for the general public.		√			
6.	The writing of the name is by the basic theory of aerobic exercise.		√			
7.	The commands or steps presented are by the basic theory of aerobic exercise.	√				
8.	The language used is easy to understand		√			

As for the suggestions from the stage, I am a material expert, namely: Please clarify and sort them according to the simple ones and try them out immediately. Percentage level rating 27/32 x 100% = 84.38 %. The results of input from material experts, as mentioned above, are then reviewed by researchers to then serve as the basis for product revisions in terms of material

Table 3. Expert Evaluation Level II

No	Aspect	Assessment				Comment
		A	D	SD	?	
1.	The material chosen and presented is the basic theory of aerobic exercise.	√				
2.	The material presented has the aim of preventing rheumatism.	√				
3.	The material presented can already be used to prevent rheumatism.	√				
4.	The images presented are by aerobic exercise techniques.	√				
5.	The created images are study able for the general public.	√				
6.	The writing of the name is by the basic theory of aerobic exercise.		√			
7.	The commands or steps presented are by the basic theory of aerobic exercise.	√				
8.	The language used is easy to understand		√			

As for the advice from material experts, stage II, namely: immediately try it out. Percentage level rating 30/32 x 100% = 93.75 %. As mentioned above, the input results from material experts were then tested.

The second stage is carried out after a revision based on the first stage validation. In the second stage of verification, media experts fill out a questionnaire provided by the researcher. The questionnaire includes three aspects of assessment, namely the physical aspects of the product, aspects of product design, and aspects of use. In the validation process, media experts ask directly about the product to be developed. Media Expert Assessment is carried out through 2 stages, namely :

Table 4. Evaluation of Level I Media Members

No	Aspect	Assessment				Comment
		A	D	SD	?	
Physical Aspects of Videos						
1.	Appropriate file size		√			
2.	Good image resolution		√			
3.	Easy operation	√				
Video Design Aspects						
4.	Attractive video design		√			
5.	Attractive display color		√			
6.	Good writing style		√			
Video Usage Aspects						
7.	This video makes it easier to learn the basic movements of aerobic exercise in preventing rheumatism.		√			
8.	This video makes it clear to learn the basic movement stages of rhythmic gymnastics.		√			
9.	This video is suitable for its users as a medium for practicing and learning the basic movements of rhythmic gymnastics.	√				

The suggestions from the stage I mediation experts are: The pictures in the guidebook are given a description and improved image resolution. Captions on pictures are slowed down so that all writing is legible and given time to think. Add sound to the video. Percent rating rate 29/36 x 100% = 80.5 %. The results of input from media experts, as mentioned above, are then reviewed by researchers to then serve as the basis for product revisions from a media perspective

Table 5. Evaluation of Level II Media Members

No	Aspect	Assessment				Comment
		A	D	SD	?	
Physical Aspects of Videos						
1.	Appropriate file size	√				
2.	Good image resolution	√				

No	Aspect	Assessment				Comment
		A	D	SD	?	
3.	Easy operation	√				
Video Design Aspects						
4.	Attractive video design		√			
5.	Attractive display color		√			
6.	Good writing style	√				
Video Usage Aspects						
7.	This video makes it easier to learn the basic movements of aerobic exercise in preventing rheumatism		√			
8.	This video makes it clear to learn the basic movement stages of rhythmic gymnastics		√			
9.	This video is suitable for its users as a medium for practicing and learning the basic movements of rhythmic gymnastics	√				

Trials on phase II media experts stated that testing without further revisions was feasible. Percent rating rate 32/36 x 100% = 88.8 %. After testing on media experts. A small group trial was carried out. The trial respondents were 5 students. Data collection was carried out by showing videos and distributing guidebooks to students. After being explained about the material in the video, students are welcome to try to make movements according to the steps in the material. Then the examiner distributes questionnaires to the selected children.

Table 6. Limited Trial Assessment Score Data

No.	Indicator	Average Score	Percentage (%)	Criteria
1.	The material chosen and presented is the basic theory of aerobic exercise	4	100	Perfect fit
2.	The material presented has the aim of preventing rheumatism	3.8	95	Perfect fit
3.	The material presented can already be used to introduce aerobic exercise techniques for the prevention of rheumatism	3.8	95	Perfect fit

4.	The images presented are by aerobic exercise techniques	3.8	95	Perfect fit
5.	The created images are studied able for the general public	3.8	95	Perfect fit
6.	Writing the name of the technique is by the basic theory of aerobic exercise	3.6	90	Perfect fit
7.	The commands or steps presented are by the basic theory of aerobic exercise	3.8	95	Perfect fit
8.	The language used is easy to understand	4	100	Perfect fit
9.	Easy video operation	3.8	95	Perfect fit
10.	Attractive video design	3.6	90	Perfect fit
11.	Attractive display color	4	100	Perfect fit
12.	Good writing style	3.6	90	Perfect fit
Total score		45.6		Perfect fit
Average		3.8	95	

The assessment is limited trial testing, stating that it was in very feasible criteria. The comments from the narrow trial results are: Good, but the sound is not clear; The videos are excellent and exciting; The book is attractive and easy to understand.

After conducting a limited trial, the researchers conducted a primary test using 10 people from Molotabu Village, Kabila Bone District, Bone Bolango Regency, Gorontalo Province, using a questionnaire. The questionnaire contains suggestions and input columns to find out responses regarding the products that have been developed. The following are the results of the assessment of the main trail.

Table 7. Main Trial Assessment Score Data

No.	Indicator	Average Score	Percentage (%)	Criteria
1.	The material chosen and presented is the basic theory of aerobic exercise	3.2	80	Perfect fit
2.	The material presented has the aim of preventing rheumatism	3.8	95	Perfect fit
3.	The material presented can already be used to introduce aerobic exercise techniques for the prevention of rheumatism	3.2	80	Perfect fit

No.	Indicator	Average Score	Percentage (%)	Criteria
4.	The images presented are by aerobic exercise techniques	3.8	95	Perfect fit
5.	The created images are studied able for the general public	3.8	95	Perfect fit
6.	Writing the name of the technique is by the basic theory of aerobic exercise	3.6	90	Perfect fit
7.	The commands or steps presented are by the basic theory of aerobic exercise	3.8	95	Perfect fit
8.	The language used is easy to understand	3.4	85	Perfect fit
9.	Easy video operation	3.8	95	Perfect fit
10.	Attractive video design	3.6	90	Perfect fit
11.	Attractive display color	3.4	85	Perfect fit
12.	Good writing style	3.8	95	Perfect fit
Total score		43.2		Perfect fit
Average		3.6	90	

The assessment in the main trial testing stated that it was in very feasible criteria. In general, the comments from the main trial results are: Easy to understand and understand; the pictures are also interesting—great song and video. The photos and videos are interesting, and the sound is clear.

Discussion

Material experts claimed that gymnastics to prevent rheumatism is possible. This is also based on the fact that aerobic exercise is beneficial and safe for sufferers of Rheumatoid Arthritis (RA) and has a calming effect on several diseases, such as increasing functional capacity, reducing pain, and increasing aerobic capacity. (13) (14) (15). Aerobic gymnastics developed by this research is low intensity because the general public can do it to prevent rheumatism. Media experts also stated that the press was instrumental in aerobic exercise due to the study. Besides being a teaching tool, good media can motivate the target community (16) (17). The media used to prevent rheumatism in aerobic exercise use audio-visual resources equipped with easy-to-understand language. Rheumatoid arthritis (RA) preventive measures require significant lifestyle changes (18) (19)/

A good lifestyle in the sense that a constant movement pattern provides comfort in the feeling of movement. A duration of aerobic exercise of about 15 minutes 3 times a

week makes patients with rheumatoid arthritis improve the quality of their actions Geraknya (20) (21). The availability of rheumatoid arthritis gymnastic movements in audio-visual format, accessible anytime and anywhere, facilitates disease prevention.

4. CONCLUSION

The main conclusion of this development study is that the resulting product can be used to prevent rheumatic diseases. I hope these aerobic exercises to avoid rheumatoid arthritis are available to the broader community. Researchers suggest that this exercise can be done continuously for the best results. Further research also needs to be developed to test the effectiveness of this aerobic exercise and spotlight it in preventing rheumatic diseases.

ACKNOWLEDGMENTS

Thank you to those who have helped in this research so the study can run smoothly.

REFERENCES

1. Veit F, Veit J, Heinen T. The Influence of Music on Judges' Evaluation of Complex Skills in Gymnastics. Eur J Sport Sci. 2022;1(5).
2. Heiniger S, Mercier H. Judging the judges: Evaluating the accuracy and national bias of international gymnastics judges. J Quant Anal Sport. 2021;17(4).
3. Permataranny MB, Yanni M, Permana H. Profil Penderita Stenosis Mitral Reumatik di RSUP Dr. M. Djamil Padang Tahun 2012-2016. J Kesehat Andalas. 2019;8(1).
4. Handono K, Wahono CS, Barlianto W, Dewi ES, Sari TL, Hasanah D, et al. Membangun Desa Binaan Tanggap COVID-19, Lupus, Reumatik, dan Alergi: Upaya Menurunkan Angka Kejadian dan Mencegah Kekambuhan di Malang. Int J Community Serv Learn. 2021;5(1).
5. Kana I erni putri bugsu. Asuhan Keperawatan Pada Nn. N. A Dengan Jantung Reumatik Di Ruangan Cempaka Rsud Prof. Dr.W.Z Johannes Kupang. Politek Kesehat Kemenkes Kupang. 2019;
6. Avdeeva MS, Belicheva T V. The effect of artistic gymnastics and step aerobics on physical performance in first-year female university students not related to sport. Hum Sport Med. 2019;19(3).
7. Irawan RJ, Anggarani MA. The Effectiveness of 8 Weeks Low Impact Aerobics and Yoga Combination Program on Body Fat Percentage among Obese Female. J Kesehat Masy. 2019;14(3).
8. Nugroho FT. Pengertian Senam Aerobik, Jenis-Jenis, dan Manfaatnya bagi Kesehatan.

Bola.com. 2021.

9. Hamzah S, B H. Pemberdayaan Masyarakat Melalui Gerakan Masyarakat Hidup Sehat (Germas) Pada Mahasiswa Di Kotamobagu. JPKM J Pengabdi Kesehat Masy [Internet]. 2021 Nov 22;2(2):172–91. Available from: https://ejurnal.ung.ac.id/index.php/jpkm/article/view/11835
10. Ongko J. SEHAT DENGAN SENAM AEROBIK. APKI. 2023.
11. Suharto DN, Agusrianto A, Rantesigi N, Tasnim T. Penerapan Senam Rematik terhadap Penurunan Skala Nyeri pada Asuhan Keperawatan Rheumatoid Arthritis di Kelurahan Gebangrejo. Madago Nurs J. 2020;1(1).
12. Trisnanda I. Pengembangan Teknik Gerak Dasar Senam Ritmik Rangkaian Freehand Berbasis Audiovisual untuk Anak Usia 7-11 Tahun. Universitas Negeri Yogyakarta; 2018.
13. Defi IR, Gultom C, Chorman MJ, Jennie J. High-intensity interval training can improve hand grip strength, inspiratory muscle, and quality of life in systemic sclerosis subjects. Reumatologia. 2021;59(2).
14. Rodriguez F, Villarreal L, Santos-Moreno P, Cabrera M, Buitrago-Garcia D, Caicedo C. THU0585 The patient's university - an innovative concept in the education of patients with rheumatoid arthritis. In 2017.
15. Ye H, Weng H, Xu Y, Wang L, Wang Q, Xu G. Effectiveness and safety of aerobic exercise for rheumatoid arthritis: a systematic review and meta-analysis of randomized controlled trials. BMC Sports Sci Med Rehabil. 2022;14(1).
16. Agustin AN, Kurniawan AW. Pengembangan Media Pembelajaran Variasi Permainan Senam Lantai Berbasis Aplikasi Articulate Storyline. Sport Sci Heal. 2021;3(6).
17. Zaeriyah S. Peningkatan Motivasi Belajar Menggunakan Project Based Learning (PjBL) melalui Media Vlog Materi Senam Aerobik. Ideguru J Karya Ilm Guru. 2022;7(1).
18. Gerlag DM, Norris JM, Tak PP. Towards prevention of autoantibody-positive rheumatoid arthritis: From lifestyle modification to preventive treatment. Rheumatol (United Kingdom). 2016;55(4).
19. Zaccardelli A, Friedlander HM, Ford JA, Sparks JA. Potential of

Lifestyle Changes for Reducing the Risk of Developing Rheumatoid Arthritis: Is an Ounce of Prevention Worth a Pound of Cure? Vol. 41, Clinical Therapeutics. 2019.

20. Harkcom TM, Lampman RM, Banwell BF, Castor CW. Therapeutic value of graded aerobic exercise training in rheumatoid arthritis. Arthritis Rheum. 1985;28(1).

21. Loeppenthin K, Esbensen BA, Klausen JM, Østergaard M, Christensen JF, Tolver A, et al. Efficacy and Acceptability of Intermittent Aerobic Exercise on Polysomnography-Measured Sleep in People With Rheumatoid Arthritis With Self-Reported Sleep Disturbance: A Randomized Controlled Trial. ACR Open Rheumatol. 2022;4(5).