

Development of a Decision Support System for Selecting Sports Types With The Fuzzy Analytic Hierarchy Process Method

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Article Info	Abstract
Received: March 28, 2023	The abstract contains a summary, introduction, problems, methods, results, and conclusions. A decision support system (SPK) for exercise selection is a system that helps someone choose the appropriate type of exercise based on several predetermined criteria. This SPK can be designed using several methods, including the Analytic Hierarchy Process (AHP method.) This approach allows users to select several criteria, such as exercise goals, physical abilities, personal preferences, and other factors influencing the decision. Next, the system assigns weights or values to each criterion selected by the user and compares the values for each sport that has been selected. The final result will provide recommendations for the most suitable type of sport to choose. In the preparation of this SPK, it is necessary to analyze data and process information about the types of movements available and collect information about the criteria considered in the selection of movements. After that, the DSS design can be done using the appropriate programming language. It is hoped that through this SPK, people can choose the right type of exercise according to their needs, thereby improving overall health and fitness
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INTRODUCTION

The importance of exercise for maintaining health and fitness is widely recognized. However, it is sometimes difficult for people to choose the type of exercise that suits their needs and preferences. This can be caused by various factors, such as a lack of knowledge about the types of exercise available, confusion in choosing the right exercise for a particular purpose, or lack of motivation to exercise. Therefore, a decision support system (DSS) campaign for type selection can be a solution. Help someone choose the right type of exercise. A DSS can take data about the available exercise types and process the data according to predefined criteria such as exercise goals, physical abilities, personal preferences and other factors that influence decision-making.

A Decision Support System (DSS) is a system that can provide problem-solving and communication to solve some structured or unstructured problems. It is designed to be easy to use and operate by people with only basic computer skills.

SPK is formed by applying high adaptability so that it can be used as an alternative to decision-making. DSS consists of two keywords, information system and decision-making. An information system is a formal set of programs in which data is grouped, processed to produce information, and then made available to users. Decision-making is a sequence of activities to select a course of action to solve a problem. Managers choose from the alternatives they face systematically based on facts, and the behaviour that can provide the best solution is called decision-making. With this SPK, it is expected that a person can choose the type of exercise that suits their needs and preferences, increasing motivation and making it easier to exercise regularly. In addition, the SPK can also provide information about the benefits of each exercise, so that users can understand the reasons behind the system's recommendations.

The AHP method was chosen because this method has a problem-solving structure with a hierarchical pattern so that complex and unstructured problems can be solved by dividing the problem into an organized and structured functional hierarchy. The AHP method has been applied to various problem topics such as location determination, property purchase, and sports fields. The AHP method was chosen because this method has a problem-solving structure with a hierarchical pattern so that complex and unstructured problems can be solved by dividing the problem into an organized and structured functional hierarchy. The AHP method has been applied to various problem topics such as location determination, property purchase, and sports fields

METHOD

AHP is a decision support model developed by Thomas L. Saaty. This decision-support model will decompose complex multi-factor or multi-criteria problems into a hierarchy, according to Saaty (1993).

The analytical Hierarchy Process (AHP) is a popular problem-solving method used in decision-making. Here are some reasons why AHP is the preferred problem-solving method compared to other methods:

Easy to use: AHP has an easy-to-understand structure and can be applied to different types of problems.

1. Allows for fair comparisons.
2. Based on the hierarchy
3. Structured and logical
4. Supports collaboration

RESULTS AND DISCUSSION

Research methodology is a method used in obtaining various data to be processed into more accurate information according to the problem to be studied. The research methodology describes the problem and is equipped with a flowchart presentation of the research implementation to make it easier to understand the research stages.

The materials needed in the research "Development of a Decision Support System for Sports Selection Using the Fuzzy Analytic Hierarchy Process (AHP) Method" include:

Data on the sports to be evaluated, such as types of sports, benefits, requirements, etc. Type of exercise: running, swimming, cycling, yoga, and weight lifting
Benefits :

- a. Soccer improves cardiovascular health, reduces body fat, increases bone density, improves cognitive brain function, good for mental health.
- b. Badminton to prevent heart disease, prevent obesity, relieve stress, increase body metabolism
- c. Volleyball for heart health, muscle building
- d. Gymnastics to improve heart function, lose weight, improve cognitive function, reduce stress and improve mood, increase stamina and body fitness
- e. Swimming to improve heart and lung health, increase flexibility, burn calories
- f. Leisurely walking to reduce the risk of developing heart disease and heart attack

Sports requirements:

- a. Soccer: The soccer team consists of 11 players, including one goalie, uniforms and soccer shoes that comply with the rules.
- b. Badminton: Each player or pair of players playing on one side of a different badminton court, must use a racket and badminton balls must be used in accordance with the rules.
- c. Volleyball: Volleyball teams consist of 6 players, and must use shoes and volleyballs that comply with the rules.
- d. Gymnastics: There are different types of gymnastics, such as floor gymnastics, rhythmic gymnastics and artistic gymnastics. Each type of gymnastics has different requirements, but in general, players must have good strength, flexibility and technique to perform gymnastic movements correctly.
- e. Swimming: must have the ability to swim and must use swimwear according to the rules.
- f. Leisure walking: must wear suitable and comfortable shoes for long-distance walking

The methods used in the research are as follows:

1. Literature Study
This stage is carried out by collecting data and information using existing materials.
2. Questionnaire
3. Data is data: nothing more and nothing less. Please avoid and refrain from over-interpretation of results, unwarranted speculation, exaggerating the importance of findings, unimportant issues, or overemphasizing the impact of your research.

This method of collecting data directly from respondents through survey completion makes it easy to exaggerate the interpretation of results. Be careful that your interpretation of the results does not go beyond what is supported by the data.

Work with Graphic

Table 1 Data Analysis

Number	Criteria	Sub-Criteria
1.	Type of sport	<ul style="list-style-type: none"> • Football • Badminton • Volleyball • Gymnastics • Swimming • Easy Walk
2.	Age	<ul style="list-style-type: none"> • Children • Adult • Elderly
3.	Gender	<ul style="list-style-type: none"> • Male • Female

Source : Indonesian Survey Scale

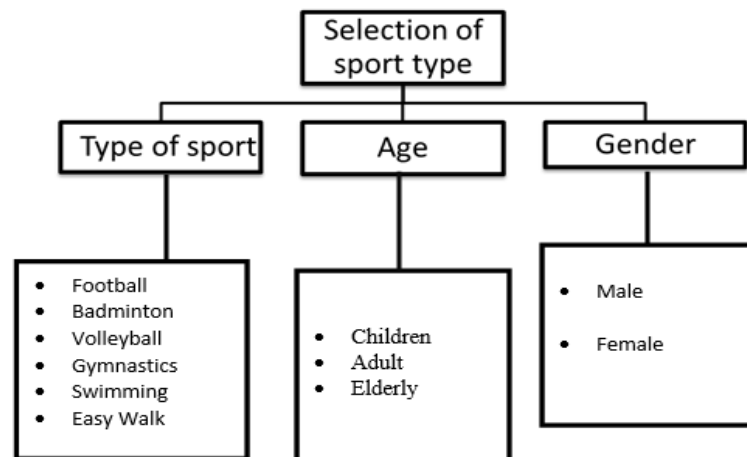


Figure 1. Hierarchical Structure

Source: Indonesian Survey Scale

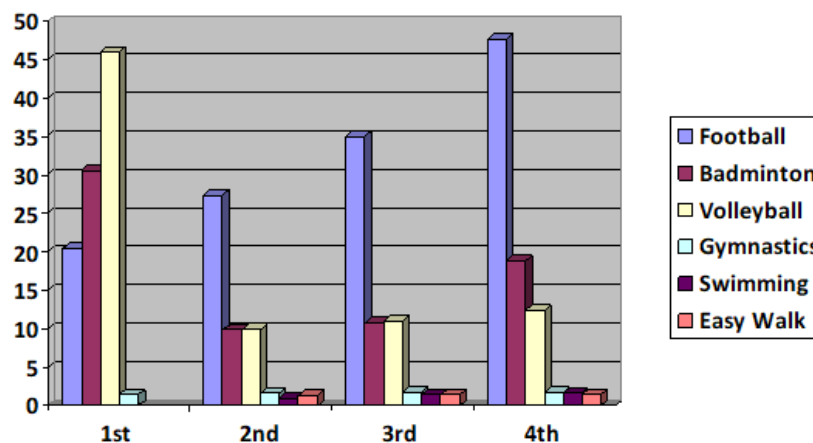


Figure 2. Diagram

Source: Indonesian Survey Scale

CONCLUSION

Based on the development of the Sports Selection Decision Support System using the Fuzzy Analytic Hierarchy Process (AHP) method, it can be concluded as follows:

1. The Fuzzy AHP method can be used as an effective approach in choosing the type of sport that suits individual preferences and needs. In the development of this system, Fuzzy AHP is used to overcome uncertainty and ambiguity in decision-making.
2. The identification of important criteria in choosing a sport, such as physical condition, personal preference, goals, availability of time and facilities, safety, cost, and environmental factors, can help individuals in choosing the right and effective type of sport.
3. In the development of this system, the important criteria are calculated for their relative weights using Fuzzy AHP to determine the type of sport that best suits individual preferences and needs.
4. The use of this decision support system can assist individuals in choosing the type of exercise that suits their preferences and needs effectively and efficiently, and help achieve health and fitness goals in a safe and appropriate manner.
5. Identification of important criteria in choosing exercise, such as physical condition, personal preference, goals, availability of time and facilities, safety, cost, and environmental factors, can help individuals in choosing the right type of exercise that is effective.
6. In the development of this system, the important criteria are calculated for their relative weights using Fuzzy AHP to determine the type of sport that best suits individual preferences and needs.
7. The use of this decision support system can assist individuals in choosing the type of exercise that suits their preferences and needs effectively and efficiently, and help achieve health and fitness goals in a safe and appropriate manner. Identifikasi kriteria penting dalam memilih olahraga, seperti kondisi fisik, preferensi pribadi, tujuan, ketersediaan waktu dan fasilitas, keamanan, biaya, dan faktor lingkungan, dapat membantu individu dalam memilih jenis olahraga yang tepat dan efektif.
8. In the development of this system, the important criteria are calculated for their relative weights using Fuzzy AHP to determine the type of exercise that best suits individual preferences and needs.
9. The use of this decision support system can assist individuals in choosing the type of exercise that suits their preferences and needs effectively and efficiently, and help achieve health and fitness goals in a safe and appropriate manner.
10. In the development of this system, these important criteria are calculated for their relative weights using Fuzzy AHP to determine the type of exercise that best suits individual preferences and needs.
11. The use of this decision support system can assist individuals in choosing the type of exercise that suits their preferences and needs effectively and efficiently, and help achieve health and fitness goals in a safe and appropriate manner.
12. Thus, the development of a Sports Selection Decision Support System with Fuzzy AHP Method can be a useful alternative in assisting individuals in choosing the right and effective type of sport based on their preferences and needs.

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