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Trends in Physical Literacy Research in Indonesian Journals: from Research Design to Data Analysis

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Abstract

Enhancing physical literacy stands as one of the multifaceted objectives to be attained through 21st Century education. This research employs content analysis on a selection of articles published within Indonesia in Sinta-indexed journals spanning the period from 2019 to 2023, with a primary emphasis on physical literacy. This study follows the content analysis principle, which centers around the examination of outcomes derived from a range of research works documented in scientific journals within Indonesia. The present study uncovers that within the last five years, there has been a relatively limited quantity of research publications concentrated on the subject of physical literacy, the most research in 2021 is two studies, the rest every year there is only one study published in a reputable or indexed journal sinta throughout Indonesia. Among these publications, the research designs used are R&D, qualitative, and quantitative. In addition, the research subjects that are often used are elementary school students. The most frequently employed data analysis method is the percentage-based observation sheet. Building upon the outcomes of this investigation, a number of suggestions have been put forth to guide subsequent research endeavors centered around physical literacy. It is recommended to enhance the regularity of research efforts aimed at exploring the evolution of physical literacy. R&D which aims to develop instructional products must be targeted to improve physical literacy. It is advisable for researchers to provide transparent and comprehensive details about the research instrument, including the instrument's validity and reliability. Lastly, it is recommended that researchers carefully select the most appropriate test in alignment with their hypothesis and research design when conducting any form of study.

Keyword: Physical literacy, physical education, data analysis

Introduction

The term "physical literacy" was initially introduced during the 1993 International Association of Physical Education and Sport for Girls and Women Congress held in Melbourne, Australia, by Whitehead. Whitehead presented various ideas about the definition of physical literacy (Robinson et al., 2018). Physical literacy can be defined as having the drive, self-assurance, physical capability, knowledge, and insight necessary to appreciate and assume responsibility for engaging in physical activities over one's lifetime (Whitehead, 2007). Essentially, physical

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literacy can be seen as an inclination marked by the motivation to utilize inherent movements to significantly enhance one's quality of life (Whitehead, 2010). It encompasses an individual's capacity to employ and blend fundamental motor movements, knowledge, understanding, and attitudes that encourage participation in physical endeavors throughout their lifespan. This concept also involves recognizing the significance of physical activity, fundamental motor skills, and the capability to make informed choices concerning health and fitness.

Physical Literacy is about building skills, knowledge and behaviors to help us lead active lives. It is holistic learning that occurs through movement and physical activity and integrates physical, psychological, social and cognitive abilities (Shearer et al., 2018). The acquisition and nature of a person's physical literacies are shaped by their surrounding circumstances, encompassing individual, environmental, societal, and cultural factors, in addition to their learning environment. For instance, an individual lacking access to water might not have the chance to enhance their aquatic movement and swimming proficiencies. The type of movements individuals partake in and the context in which these movements unfold can both influence the integration of developments across different areas of physical literacy (Dudley, 2018). To illustrate, someone who consistently employs an exercise bike for 30 minutes daily at unchanging settings might uphold a certain level of physical engagement (and fitness), but the development of comprehensive aptitudes spanning all four domains is improbable. Conversely, children who cycle with companions are presented with enhanced prospects to cultivate holistic proficiencies, such as stability and equilibrium (physical), prudent behavior (cognitive), positive interpersonal connections (social), and self-assurance within groups (psychological) (Dudley et al., 2017). Over a lifetime, an individual's experiences can yield both advancement and regression in diverse aspects of physical literacy contingent upon their circumstances. This framework centers on what can be achieved, thereby offering a means to stimulate movement and physical involvement, not solely restricted to its origins, particularly in the context of preparing preschool-aged children (Cairney et al., 2016). The following are the components of physical literacy according to (R. Keegan & Dudley, 2019) which is presented in figure 1.

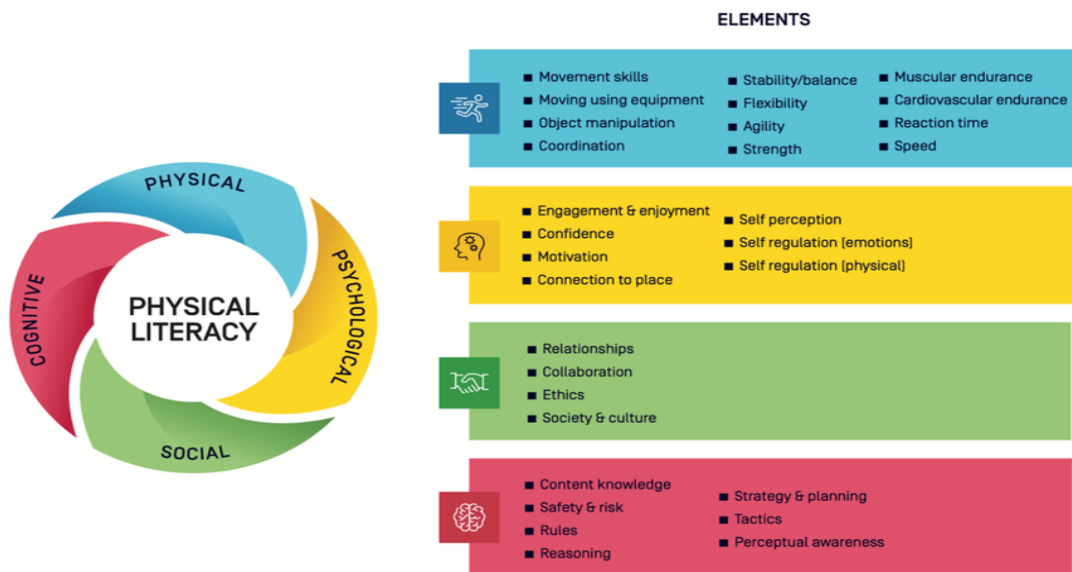


Figure 1: The four components of Physical Literacy.

The promotion of physical literacy can take place during a critical phase in the development of fundamental motor skills, as highlighted by (Hulteen et al., 2017). The prime window for engaging in movement-related activities typically emerges within the age range of 3 to 6 years in children, (Goodway, Jacqueline D., John C. Ozmun, 2021). At this time children generally attend kindergarten, (Wu et al., 2021). This period is a critical period in the formation of basic movement skills such as walking, running, jumping, throwing which can encourage the process of developing their basic motor skills, such as speed, strength, coordination and balance. (Goodway, Jacqueline D., John C. Ozmun, 2021) also capable of influencing subsequent levels of physical activity in adolescence and adulthood, (Essiet et al., 2021). Incorporating active learning strategies into the educational process is anticipated to alleviate student monotony or lack of engagement (Albar, 2023). Promotion of this OT can be actualized through the physical education curriculum in schools, especially in kindergarten, because children's motoric competence does not seem to appear naturally during the early childhood age range but as a result of cooperation from dynamic subsystems, namely through the assignment of motion, early childhood as students and the environment. Thus, motor competence, including individual fundamental motor skills, is the product of interactions within and between subsystems that are dynamic and work together (RJ Keegan et al., 2019). Sustainable development was identified as a solution to address numerous social, economic, and environmental complexities (Alkhalwaldeh & Mahmoud, 2023).

Although the PL concept is not always associated with fundamental motor skills, (Almond, 2014; Doherty et al., 2019; Pot et al., 2018) but fundamental motor skills are one of the components in a comprehensive PL concept that can be taught through the process of physical education in schools with physical activities in the curriculum to support an active life style, (Bakhtiar et al., 2020). Fundamental motor skills become material in motion learning held at kindergarten to support the promotion of OT for early childhood, (Clements & Schneider, 2017). To become a physical literacy person, children need to master basic movement skills, but this mastery does not come automatically but requires habituation and practice. (Birnbaum et al., 2016). It should be remembered that children are not miniature adults, for this reason, almost every skill needed by a developing child is taught through a series of stages of movement tasks that are appropriate to their development (Ozbar et al., 2017). In early childhood, PL is a combination of mastering basic movement skills and basic sports skills, which allows a child to see and understand the movements that occur around him, so as to make the right decisions based on that understanding (Canadian Sport for Life, 2017).

In the age of digital advancements and the growing prevalence of inactive routines, it becomes crucial for individuals to cultivate proficiencies and a comprehensive awareness regarding the significance of engaging in physical activities. The concept of physical literacy is swiftly evolving within the realm of physical education and sports. Given the rise in sedentary living and the escalating health concerns linked to insufficient physical engagement, comprehending the essence of physical literacy holds paramount significance. Physical literacy pertains to an individual's capacity to employ fundamental motor abilities, a grasp of physical activity, and attitudes that foster participation in physical endeavors throughout their lifespan.

Methodology

Research Design

This study follows the content analysis principle, which centers around the examination of outcomes derived from a range of research works documented in scientific journals within Indonesia.

Data Collection

Information was gathered from the outcomes of analyzing content within articles related to physical literacy. These articles were exclusively sourced from physical education journals that are enlisted in the Science and Technology Index (SINTA) as of July 2023. SINTA, accessible at <https://sinta.kemdikbud.go.id/>, serves as a platform established by the Ministry of Research, Technology, and Indonesian Higher Education to gauge the advancement of science and technology. Consequently, all articles appraising physical literacy were compiled from these respective journals. The articles subjected to analysis in this research were published online prior to July 2023.

Research Instruments

The tool utilized in this study is a content analysis guideline that encompasses pertinent observed elements (see Table 1). Within this research, seven primary aspects underwent scrutiny for content analysis. These aspects encompass (1) the annual publication count; (2) research typology; (3) research participants; (4) selected themes within physical education for study; (5) maintenance; (6) instruments for data collection; and (7) methodology for data analysis. However, it's noteworthy that categories within aspects (1), (4), and (5) were not predetermined due to the absence of preceding studies that could offer guidance on the content of these categories. This lack of established categories could potentially result in excessive generalization when executing content analysis across multiple articles. Conversely, classifications within aspects (2), (3), (6), and (7) were established prior to the commencement of data collection (Fauzi & Pradipta, 2018). Additionally, aspect (2) is bifurcated into two sub-aspects: (2a) general classification of research and (2b) design of quantitative research.

Table 1: Aspects and Categories used for Content Analysis in the Study.

Aspect	Category	
Type of research (2a)	A. 1- R and D A. 2- CAR	A. 3- Qualitative Research A. 4- Quantitative Research
Quantitative type of research (2b)	B. 1- Observational Study (OS) B. 2- Correlational Research (CR) B. 3- Survey Research (SR) B. 4- Pre-Experimental Designs (PED)	B. 5- True Experimental Designs (TED) B. 6- Quasi-Experimental Designs (QED) B. 7- Ex Post Facto Designs (EPFD)
Research subject	C. 1- Kindergarten students C. 2- Elementary students C. 3- Middle school students C. 4- High school student C. 5- Undergraduate Student C. 6- Graduate Students	C. 7- Teacher C. 8- Lecturer
Data collection instrument	D. 1- Questionnaire sheet D. 2- Observation sheet D. 3- Test sheet	D. 4- Interview sheet D. 5- not identified
Data analysis method	E. 1- Average E. 2- Percentage E. 3- N-Gain E. 4- T-test E. 5- ANOVA	E. 6- ANCOVA E. 7- Correlation E. 8- Not identified E. 9- Others

Data Analysis

Every article is categorized into a specific group determined by particular criteria that align with the designated categories. These determinations stem from the details provided by the authors within the abstract, methods, and discussion sections. Furthermore, the accumulated data is portrayed in the format of a bar chart.

Results and Discussion

Publication Count

The count of published articles indicates the frequency of research conducted within a specific timeframe. In the context of Indonesia, there were a total of 10 articles reviewing Physical Literacy that were published in domestic journals. However, those registered on Sinta accounted for 6 articles. These articles have been available since 2019. Notably, there isn't a distinct pattern of fluctuation in the annual publication count. Nonetheless, referencing Figure 2, there is a visible increment in the publication count for the year 2021, albeit not substantially pronounced.

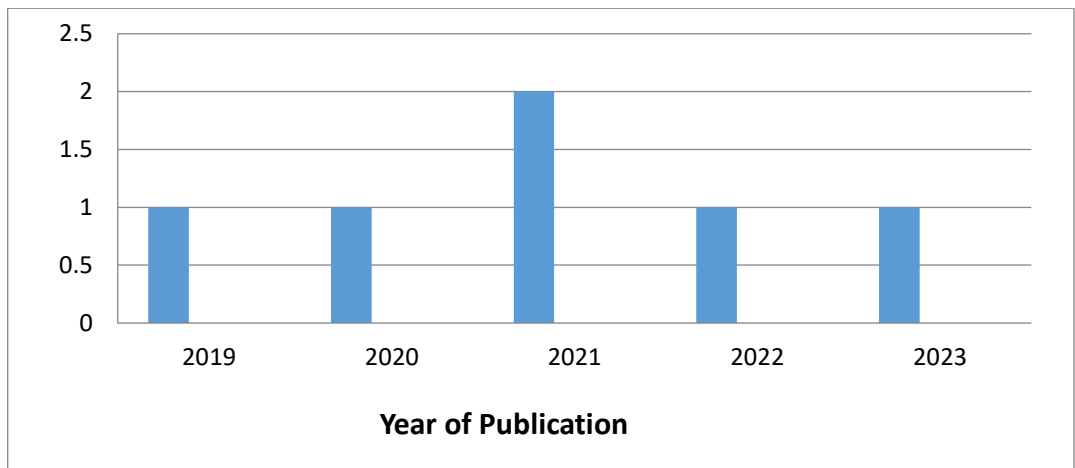


Figure 2: Illustrates the Upward Trajectory of Physical Literacy Research Becoming a Predominant Focus in Indonesia Over the Past Five Years.

The majority of research findings stem from researchers' awareness of prevalent issues that frequently manifest in their surroundings. Presently, one of the challenges faced is the insufficient physical literacy among students in Indonesia. Therefore, conducting research is the most effective way to solve the problem. Through research, researchers can identify the most effective learning designs or media that can optimally accommodate students' physical literacy.

Types of Research

The type and design of the research determines the focus of the research. As depicted in Figure 3, the types of R and D, qualitative, and quantitative research are the designs used by researchers in investigating Physical Literacy.

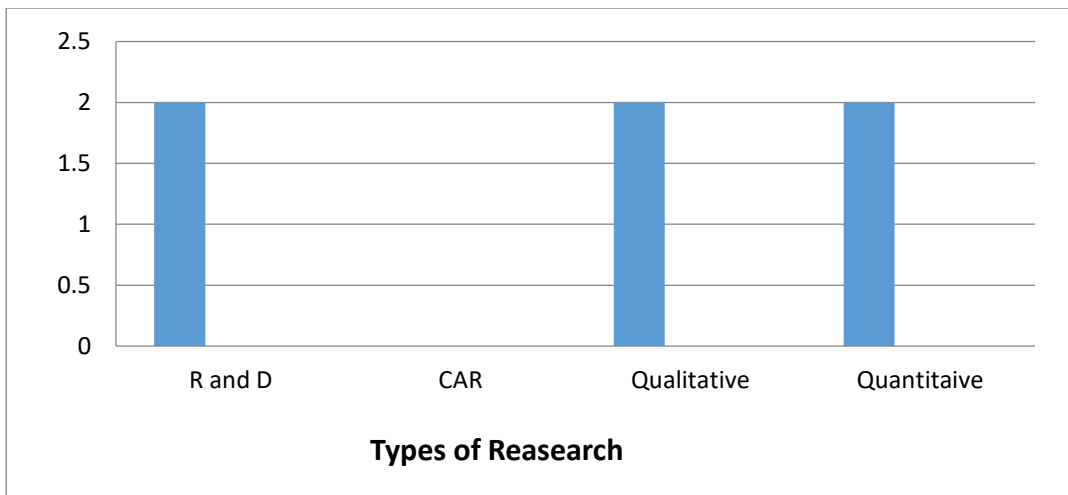


Figure 3: Depicts the Categorization of Research Focused on Physical Literacy, Organized According to Research Type.

R&D research, qualitative and quantitative are types of research that are often used in physical literacy. However, the findings reveal that there has been no research using this type of CAR research. This indicates that there is still a lack of research related to physical literacy in Indonesia, especially in this type of research.

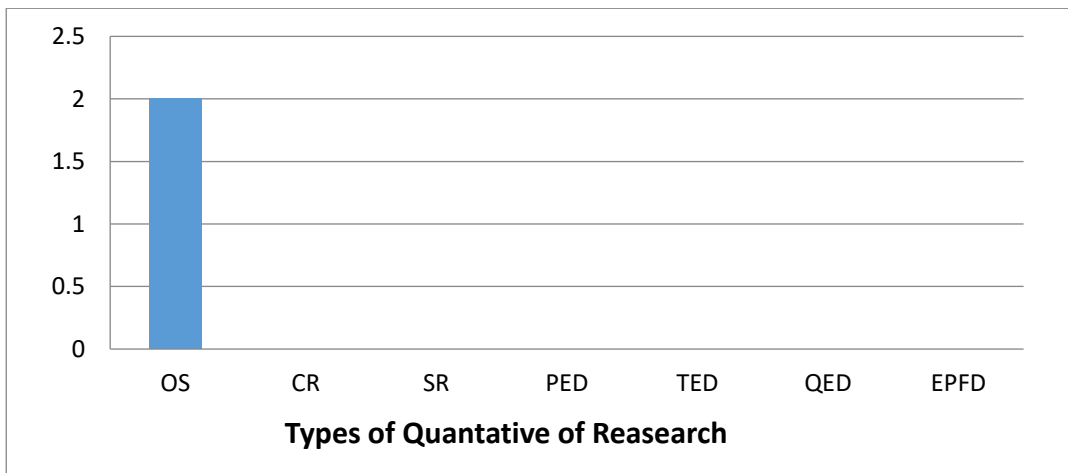


Figure 4: Illustrates the Dispersion of Quantitative Research Centered on Physical Literacy as the Primary Focus Within Indonesia.

In addition to the type of research, this study also aims to reveal the distribution of quantitative research chosen by most researchers. Based on Figure 4, the observational study design indicates what is used to determine physical literacy. In this article the type of quantitative research that is often used is the observation sheet chosen by the researcher.

Research Subjects

Empowerment of physical literacy is aimed at students. Based on the data obtained regarding physical literacy, most of the research was carried out at elementary level schools, between the

ages of 8 and 12 years, and some even studied at the kindergarten level. No research has been conducted to explore or analyze the high school level.

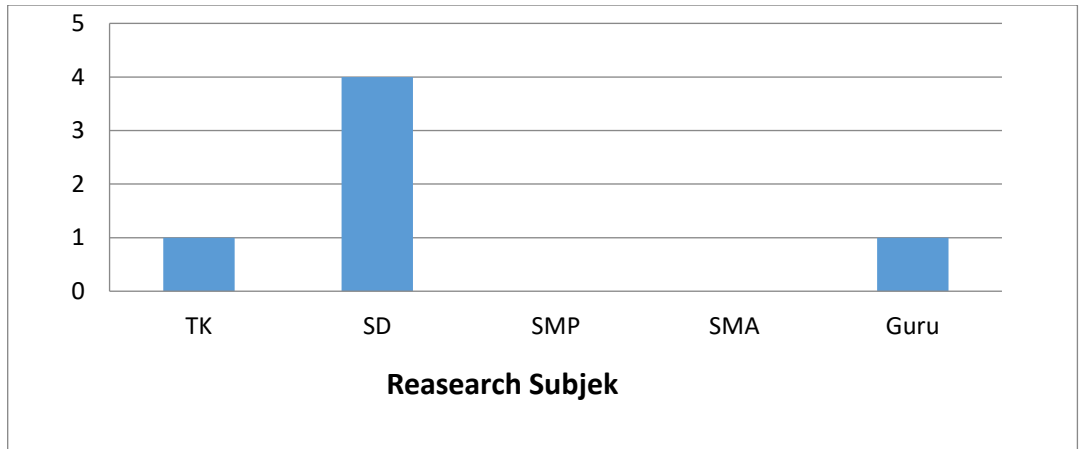


Figure 5: Illustrates the Allocation of Research Subjects Across Various Educational Studies with a Primary Focus on Physical Literacy Within Indonesia.

The prevalence of elementary school students is highlighted in the research conducted by (Lin et al., 2014). According to their investigations, within the past 15 years, the learning process and students' conceptual comprehension constitute two of the three frequently selected areas of study. This observation aligns with (Choi et al., 2016), who contends that students rank third among the most extensively examined factors in educational research. Additionally, alongside presenting data on varying educational tiers, Figure 5 demonstrates that as the level of education increases, it becomes less frequently chosen as a research subject.

Data Collection Instruments

When undertaking research, researchers require tools for gathering data from participants. The assessment of physical literacy competence can be accomplished through diverse instruments crafted by preceding researchers. As indicated by the graph depicted in Figure 6, observation sheets are the most commonly employed tools by researchers for procuring data concerning physical literacy.

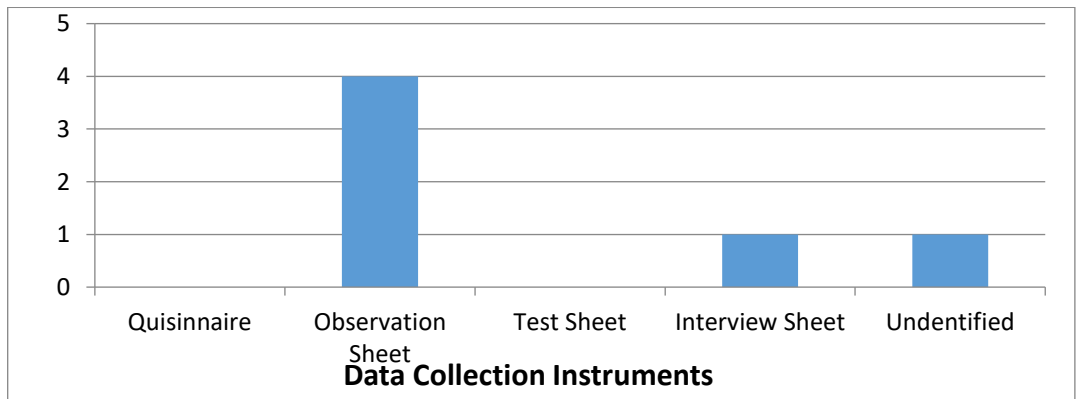


Figure 6: Presents the Breakdown of the Selection of Data Collection Instruments in a Range of Studies with Physical Literacy as the Primary Focus Within Indonesia.

Method of Data Analysis

The precision in opting for data analysis methodologies significantly influences the degree of validity in a study. Consulting the chart depicted in Figure 7, the data analysis that is often used in this study is the percentage with a total of 4 articles, then 1 article of N-Gain, and 1 unidentified. We can see this through the following graph:

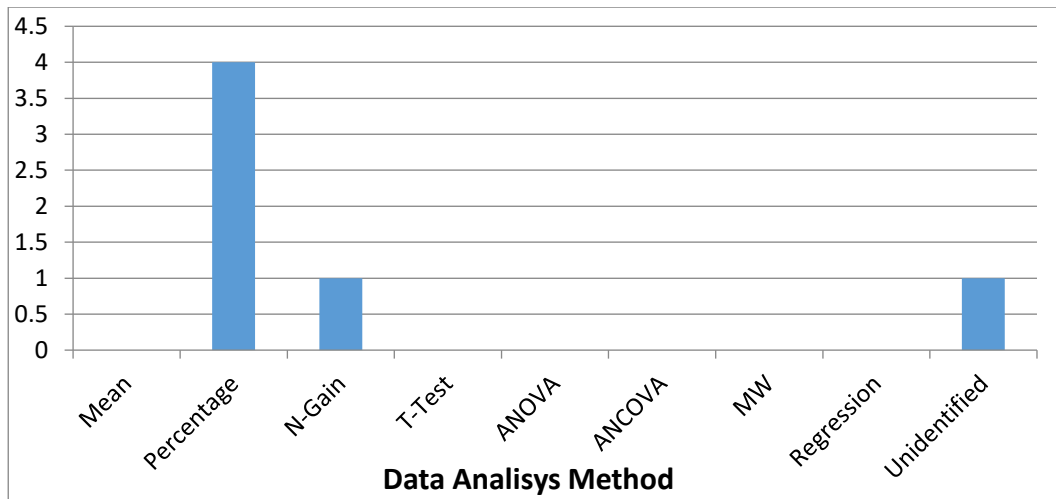


Figure 7: Distribution of the Selection of Data Analysis Methods Several studies with Physical Literacy as the Main Concern in Indonesia.

Measurement is very influential in a study, research will not get the results that are in line with expectations if we are not right in choosing the method of analysis. Various types of analysis can be used in any research depending on what we want to examine. In this article it turns out that the use of percentage analysis is more compared to other analyses. Utilizing ANCOVA for measurement is particularly advisable, especially when researchers are grappling with the choice of a quasi-experimental design. This becomes pertinent in situations where selecting students individually as research subjects isn't feasible, and only students from specific classes can be included. Employing ANCOVA in such scenarios allows researchers to manage extraneous variables that could potentially impact the connection between the independent and dependent variables. Additionally, as highlighted by Warner (2012), the application of ANCOVA is particularly recommended for quasi-experimental studies involving pre-test and post-test data, to ensure accurate results.

Discussion

The more research that investigates physical literacy, the greater its positive influence on the development of physical education in Indonesia. This viewpoint is rooted in the notion that the primary objective of research is to enhance educational methodologies (Coburn & Penuel, 2016). Moreover, a study can impact educational practice for several reasons: Firstly, its discoveries can serve as a reliable information source that educators can apply; Secondly, it can establish a foundational cornerstone for educational decision-making at levels ranging from national to local or specialized institutions; and Thirdly, the findings can shape the cognitive frameworks of teachers.

In addition to the type of research, this study also aims to reveal the distribution of quantitative research chosen by most researchers. Based on the results of the analysis, the observational study design indicates what is often used to determine physical literacy. In this article the type of quantitative research that is often used is the observation sheet chosen by the researcher. Based on the data obtained regarding physical literacy, most of the research was carried out at elementary school levels, between the ages of 8 and 12 years, and some even studied at the kindergarten level. There is no research that reveals or examines the high school level. this could be an opportunity to research to the high school level.

Conclusion

In this study, an examination has been conducted on articles that address the topic of physical literacy and are featured in Sinta-accredited journals across Indonesia within the time frame of 2019 to 2023. A noticeable trend is observed indicating a rise in the quantity of publications that prioritize physical literacy as a central subject matter. which is still lacking. It can be shown that the highest research publication results are in 2021 and even then there are only 2 publications and in other years there is only 1 publication each year. In addition, students at elementary schools were the most frequently chosen as research subjects, no one had studied at the secondary school level, either junior high or high school. The most widely used observation sheet as a research instrument and data analysis that is often used is the percentage.

Based on the findings of this investigation, various suggestions have been put forward for future research endeavors. Firstly, it is recommended to enhance the regularity of research efforts aimed at exploring the evolution of physical literacy. Second, R&D which aims to develop instructional products must be targeted to improve physical literacy. Third, it is advisable for researchers to provide transparent and comprehensive details about the research instrument, including the instrument's validity and reliability. Lastly, it is recommended that researchers carefully select the most appropriate test in alignment with their hypothesis and research design when conducting any form of study.

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