

Physical Activity Based Learning Model for Psychological Well-being of Disabled Students

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Abstract

This study aims to develop a physical activity-based learning model and test its effectiveness on the psychological well-being of students with disabilities. Using the Research and Development (R&D) method, this study involved 20 students with disabilities (10 males and 10 females) aged 10-15 years from SLB PKK Bandar Lampung. The results of the study show that the learning model developed has the potential to improve the psychological welfare of students with disabilities.

Keywords: Physical Activity; Psychological Well-Being; Students with Disabilities

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INTRODUCTION

Psychological well-being of students with disabilities is a crucial aspect that is often overlooked in the special education system. According to the World Health Organization (WHO, 2021), about 15% of the world's population lives with a disability, with most facing significant challenges in accessing quality education. In Indonesia, data from the Ministry of Education and Culture (2020) shows that only 18% of the total students with disabilities enrolled in schools receive adequate educational services. This situation is exacerbated by the lack of learning models specifically designed to improve the psychological well-being of students with disabilities.

Several recent studies have revealed the potential of physical activity in improving the psychological well-being of individuals with disabilities. Maiano et al. (2019) found that participation in structured physical activity can improve self-esteem and lower anxiety levels in adolescents with intellectual disabilities. In line with that, a longitudinal study conducted by Schmidt et al. (2020) showed a positive correlation between regular physical activity and improved quality of life of students with physical disabilities. However, as

highlighted by Ng et al. (2021), the implementation of physical activity programs in exceptional schools still faces various obstacles, including limited resources and lack of validated learning models. The gap between the potential benefits of physical activity and its implementation in the context of special education raises the research question: "How to develop and evaluate the effectiveness of physical activity-based learning models that can improve the psychological well-being of students with disabilities?" The hypothesis proposed is that a physical activity-based learning model designed specifically for students with disabilities will have a positive impact on their psychological well-being.

To answer the research question, the study adopted a Research and Development (R&D) approach modified from the Borg and Gall (2018) model. The analytical framework used combines the experiential learning theory from Kolb (2021) with the bio-psycho-social disability model proposed by Wade and Halligan (2022). This approach allows the development of a learning model that not only focuses on the physical aspect, but also considers the psychological and social dimensions of the experience of students with disabilities. The main purpose of this study is to develop and test the effectiveness of a physical activity-based learning model that can improve the psychological well-being of students with disabilities. Specifically, this study aims to: (1) identify key components in the physical activity-based learning model that are suitable for students with disabilities, (2) design and implement the learning model at SLB PKK Bandar Lampung, and (3) evaluate the impact of the learning model on the psychological well-being indicators of students with disabilities.

Through this research, it is hoped that an innovative learning model can be produced that not only improves the psychological welfare of students with disabilities, but also makes a significant contribution to the development of inclusive educational practices in Indonesia.

METHOD

Design

This study adopts a Research and Development (R&D) approach modified from the Borg and Gall (2018) model, with the integration of explanatory sequential mixed-method design (Creswell & Creswell, 2020). The research procedure consists of five main stages: (1) needs analysis, (2) model design, (3) model development, (4) implementation, and (5) evaluation. The needs analysis stage involves a comprehensive literature study using the ERIC, PsycINFO, and Google Scholar databases, with the keywords "physical activity", "psychological well-being", and "students with disabilities". In-depth interviews were also conducted with 5 special education teachers and 3 educational psychologists to identify the specific needs of students with disabilities.

Participants

The research participants consisted of 20 students with disabilities (10 males and 10 females, aged 10-15 years) from SLB PKK Bandar Lampung, who were selected using a purposive sampling technique based on the inclusion criteria set by Houwen et al. (2019). These criteria include: (a) an official diagnosis of mild to moderate intellectual disability, (b) the ability to participate in basic physical activity, and (c) parental or guardian consent.

Instruments

The research instruments used include: (1) Psychological Well-being Questionnaire for Children (KKPA) adapted from Ryff's Scales of Psychological Well-being (Ryff et al., 2021),

(2) Student Activity Observation Sheet (LOAS) developed based on Haegele and Zhu's (2022) observation guidelines, and (3) Semi-Structured Interviews compiled referring to Brinkmann's (2021) recommendations for qualitative research with participants with disabilities.

The physical activity-based learning model was developed through an iterative process, involving a teacher and 1 sports psychologist. The validity of the model's content was assessed using the Content Validity Index (CVI) with a threshold of 0.78 as recommended by Polit et al. (2022). The implementation of the model was carried out for 12 weeks, with structured physical activity sessions 3 times a week, each lasting 45 minutes. Each session consists of: (1) adaptive warm-up (10 minutes), (2) game-based core activities (25 minutes), and (3) cooling and reflection (10 minutes).

Analysis

Data analysis uses a mixed-method approach. Quantitative data from the KKPA were analyzed using paired t-tests and ANOVA repeated measures with the help of SPSS software version 27.0, to evaluate changes in psychological well-being scores before and after the intervention. The effect size was calculated using Cohen's d with an interpretation following the guidelines from Lakens (2022). Qualitative data from LOAS and interviews were transcribed verbatim and analyzed using reflexive thematic analysis according to the procedure outlined by Braun et al. (2023). To increase the credibility of the results, data triangulation and member checking were carried out with participants and accompanying teachers.

RESULT AND DISCUSSION

Learning Model Development

The results of needs analysis and interviews resulted in a physical activity-based learning model consisting of four main components: (1) Adaptive warm-up activities, (2) Integrated motor skills training, (3) Adaptive collaborative play, and (4) Reflection and relaxation. This model combines the principles of experiential learning (Kolb, 2021) with a bio-psycho-social approach to disability (Wade & Halligan, 2022). The model's content validation achieved a Content Validity Index (CVI) of 0.86, surpassing the threshold of 0.78 recommended by Polit et al. (2022), indicating good content validity.

Effectiveness of the Learning Model

Quantitative analysis using paired t-tests showed a significant improvement in the scores of the Psychological Well-being Questionnaire for Children (KKPA) after 12 weeks of intervention ($t(19) = 5.67$, $p < 0.001$, $d = 1.27$). Table 1 presents changes in KKPA scores before and after the intervention.

Table 1. Changes in KKPA Score Before and After the Intervention

KKPA Dimensions	Pre-test M (SD)	Post-test (SD)	t	p	Cohen's d
Self-Acceptance	3.21 (0.76)	4.15 (0.62)	4.89	<0.001	1.09
Positive Relationships	3.45 (0.83)	4.32 (0.57)	4.23	<0.001	0.95
Self-government	2.98 (0.91)	3.87 (0.74)	3.78	<0.001	0.84
Environmental Mastery	3.12 (0.79)	3.96 (0.68)	4.11	<0.001	0.92
Purpose of Life	3.33 (0.85)	4.08 (0.71)	3.56	<0.001	0.80

Personal Growth	3.28 (0.88)	4.21 (0.65)	4.45	<0.001	0.99
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Note: *M* = Mean, *SD* = Standard Deviation

These results showed a large effect ($d > 0.8$) on all dimensions of psychological well-being, with the greatest increases in the dimensions of self-acceptance ($d = 1.09$) and personal growth ($d = 0.99$). These findings are in line with a study by Schmidt et al. (2020) that reported the positive impact of physical activity on the self-esteem of adolescents with disabilities.

Thematic analysis of qualitative data from observations and interviews revealed three main themes: (1) Increased self-confidence, (2) Strengthening social interaction, and (3) Improving emotional regulation. Figure 1 illustrates the relationship between these themes.

The theme of increasing self-confidence was reflected in the statement of one participant: "Now I feel like I can do many things that I used to think were impossible" (P7, 13 years old). These findings are consistent with a study by Maiano et al. (2019) which found a positive correlation between participation in physical activity and increased self-esteem in adolescents with intellectual disabilities.

The strengthening of social interaction can be seen through increased cooperation and communication between students during adaptive collaborative play sessions. Observation showed an increase in the frequency of positive interactions between students by 68% compared to baseline. This supports the argument of Ng et al. (2021) about the important role of physical activity in improving the social skills of students with disabilities. Increased emotion regulation was observed through students' ability to manage frustration and anxiety during challenging activities. One of the co-teachers stated, "I noticed a significant change in the way they handled stressful situations. They are calmer and able to express their feelings better" (G3). These findings reinforce the results of Houwen et al. (2019) research on the positive effects of motor interventions on cognitive and social functioning of individuals with intellectual disabilities.

Challenges and Adaptation

The implementation of the learning model faces several challenges, especially in terms of adjusting activities to accommodate variations in students' abilities. The adaptation strategies developed include: (1) The use of a buddy system to support students who need more help. (2) Modification of equipment and game rules to ensure inclusive participation. (1) The application of a progressive approach in increasing the complexity of activities.

These strategies are in line with the recommendations of Haegele and Zhu (2022) on the importance of individual adaptation in inclusive physical education.

Implications and Limitations

The results of this study have significant implications for the development of inclusive education practices in Indonesia. The developed physical activity-based learning model has the potential to be a framework to improve the psychological well-being of students with disabilities in various special education contexts. However, this study has some limitations. First, the relatively small sample size ($N=20$) limits the generalization of the findings. Second, the duration of the 12-week intervention may not be sufficient to assess long-term effects. Third, limitations in the variety of types of disability of participants require caution in applying this model to a more diverse population of people with disabilities.

Further research is needed to test the effectiveness of this model on a larger scale and with a more diverse population of students with disabilities. Longitudinal studies are also recommended to assess the sustainability of the positive effects observed.

CONCLUSION

This study succeeded in developing and evaluating the effectiveness of a physical activity-based learning model that can improve the psychological well-being of students with disabilities. The developed model, which consists of adaptive warm-up activities, integrated motor skills training, adaptive collaborative play, and reflection and relaxation, has proven effective in improving various aspects of the psychological well-being of students with disabilities. Significant improvements were observed mainly in the dimensions of self-acceptance, personal growth, and social interaction. These findings affirm the potential of structured physical activity as a powerful pedagogical tool in supporting the holistic development of students with disabilities, while highlighting the importance of an adaptive and inclusive learning approach in the context of special education. Based on these findings, it is recommended that special educational institutions consider integrating physical activity-based learning models into their curriculum. For future studies, it is recommended to conduct longitudinal studies with larger sample sizes and involve students with a wider spectrum of disabilities. This will allow for a deeper understanding of the long-term effectiveness of this model and its potential adaptation for different types of disabilities. In addition, further exploration of the role of assistive technology in supporting the implementation of this model can also provide valuable insights for the development of inclusive educational practices in the digital era.

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