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MAPPING RESEARCH TRENDS IN MOTIVATION AND SELF-CONFIDENCE FOR OBESE PRIMARY SCHOOL STUDENTS: A BIBLIOMETRIC PERSPECTIVE

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Abstract:

Research on motivation, self-confidence, and physical well-being among obese primary school students in physical education has grown substantially over the past two decades, reflecting heightened concern over childhood obesity and its impact on students' physical and psychological health. Analysis of publication trends from 2004 to 2024 reveals that the topic gained traction in 2012, reaching a peak between 2016 and 2018, with research contributions largely from the United States, followed by countries like Australia and the United Kingdom. A total of 1,041 documents were analyzed, with key contributors and highly cited works identified, showcasing influential studies focused on physical education interventions and psychosocial well-being. Using Scopus Analyzer and VOSviewer software, the study mapped co-authorship networks, identifying the top 10 authors and revealing collaborative trends that support an interdisciplinary approach to obesity research in educational contexts. Keywords such as "obesity," "physical activity," "self-confidence," and "motivation" emerged as prevalent, reflecting central themes in understanding and addressing obesity through school-based physical education. Numerical findings indicate strong co-authorship connections among authors and high citation counts for works emphasizing active interventions and mental health support in physical education curricula. These findings suggest a sustained

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need for evidence-based strategies to foster both physical and psychological resilience in obese primary school students, highlighting the importance of continued global collaboration in this field. The results provide valuable insights for future research directions, emphasizing comprehensive approaches to improve the well-being of students through targeted, interdisciplinary physical education initiatives.

Keywords:

Motivation, Self-Motivation, Physical Well-Being, Obese Students, Physical Education

Introduction

The implementation and awareness of research trends in motivation, self-confidence, and physical well-being among obese primary school students in physical education in Malaysia is a critical area of study. Grounded in self-determination theory, research has shown that teacher support plays a significant role in engaging students with obesity in physical education. However, it is not merely the presence of support but the quality of support that meets students' basic psychological needs that can foster engagement and autonomous motivation. For instance, a study involving Chinese high school students with obesity found that teacher support that satisfies basic psychological needs can promote engagement in physical education through pathways involving these needs and autonomous motivation (Zhang & Qian, 2022). This highlights the importance of tailored support strategies that consider the unique physical and mental characteristics of obese students to enhance their participation and motivation in physical education. In Malaysia, school-based physical activity interventions have shown promising results in improving physical well-being among students. Programs such as EPaL and MASCOT have been effective in promoting physical activity, reducing body mass index (BMI), and enhancing cardiovascular endurance and flexibility among Malaysian children (Rizal et al., 2019). These interventions often incorporate cognitive and behavioural skills training to alter disordered eating behaviors and prevent sedentary lifestyles. Additionally, the integration of comprehensive frameworks like the transtheoretical model has been shown to improve participant adherence to physical activity programs. These findings underscore the potential of structured physical education programs in schools to address obesity and promote healthier lifestyles among primary school students in Malaysia.

Literature Review

A comprehensive exploration of the literature reveals that physical education (PE) and physical activity are critical for improving motivation, self-confidence, and well-being in primary school students, especially those with obesity. (Liu et al., 2024) identified a negative correlation between physical activity and bullying victimization, suggesting that higher physical activity levels may reduce bullying experiences, thus potentially improving students' self-confidence and social well-being. This finding aligns with other research indicating that increased physical activity can positively influence psychosocial factors, such as self-efficacy and motivation, which are particularly beneficial for overweight children (Urbano-Mairena et al., 2024). However, the overall correlation between physical activity and bullying perpetration was insignificant, highlighting a need for more specific interventions targeting victimization, especially for vulnerable groups such as obese students.

The family environment also plays a critical role in developing motivation and physical self-efficacy in students. According to (Jiang & Xiao, 2024), a supportive family physical activity environment can significantly improve adolescents' adherence to exercise, mediated by enhanced exercise self-efficacy and satisfaction. This finding underscores the importance of family support in fostering a positive attitude toward physical activity among children. Moreover, (Greule et al., 2024) found that self-efficacy, autonomy support, and peer acceptance are strongly correlated with physical activity enjoyment, suggesting that these psychological and social factors could enhance the well-being of obese children by fostering a supportive environment that encourages sustained engagement in physical activities. Integrating physical activity into school routines is another critical trend in promoting healthy lifestyles among students. (Tafari & Latino, 2024) argue that schools are an ideal setting for instilling lifelong healthy habits and fostering psycho-social development. By incorporating active breaks and motor activities into daily school routines, schools can improve students' physical and mental health, including their motivation to engage in physical activities. Similarly, (Urbano-Mairena et al., 2024) emphasized the importance of a school curriculum that promotes physical literacy, which positively correlates with life satisfaction and inversely with BMI. These findings advocate for school-based interventions targeting obese students' physical and psychological well-being, although challenges such as curriculum constraints need to be addressed.

The relationship between physical activity and mental health in students is further highlighted in studies addressing the effects of exercise on problematic behaviours. (Xu & Tang, 2024) showed that physical exercise reduces problematic internet use among college students by enhancing self-control and reducing loneliness. Although this study focused on college students, the findings suggest that similar mechanisms could apply to younger students, particularly those who are obese and may face social isolation. The mediating effects of self-control and loneliness highlight the potential for exercise to improve mental health outcomes, making it a valuable tool for addressing psychological challenges in obese students, who may be at higher risk of social withdrawal. Despite the benefits of physical activity on motivation, self-confidence, and well-being, research also reveals significant gaps in knowledge, particularly in the context of PE programs specifically designed for obese children. (Greule et al., 2024) identified a gap in studies focusing on the perception of physical activity enjoyment among overweight or obese children. Most research has concentrated on general populations, overlooking the unique challenges and motivations of obese children. Addressing this gap is essential to develop tailored PE interventions that can effectively enhance enjoyment and long-term adherence to physical activity in this subgroup, ultimately fostering better mental and physical health. Research conducted by (Li et al., 2024) in Malaysia underscores the limitations within the PE curriculum that hinder the promotion of a holistic health education program. Barriers identified include a lack of support from school administrators and inadequate facilities, which may disproportionately impact obese students by limiting their access to inclusive and supportive PE environments. This highlights a critical need for policy-level changes that prioritize the inclusivity of PE programs to cater to diverse needs, including those of obese students, ensuring that PE not only promotes physical fitness but also improves self-confidence and motivation in all students.

Furthermore, research trends concerning motivation, self-confidence, and physical well-being among obese primary school students in PE settings reveal an increasingly complex relationship between physical activity, psychological well-being, and social factors. For

instance, the work of (Ortín et al., 2024) identifies a significant gap in adolescents' physical activity during PE, especially among those classified as overweight. This study underscores a low engagement level, revealing that students with higher BMI often display reduced motivation and social interaction preferences. Through their use of the Graupera/Ruiz Scale of Preferences for Social Interaction in PE, they found that both male and female students displayed a preference for cooperative over competitive environments, indicating the importance of social elements in fostering motivation in PE. These findings highlight a consistent trend in the literature that suggests physical and social factors interact in complex ways, potentially affecting obese students' motivation and engagement in PE settings. Similar findings by (Wang et al., 2024), which explored the 24-hour activity behaviours of students with varying BMIs, confirmed a positive correlation between physical engagement and psychological well-being, with lower engagement levels observed in overweight students. (Pavlović et al., 2024) further contribute by showing that while obesity rates among adolescents are relatively low in some areas, there remains a significant need for updated strategies to enhance active lifestyles, particularly focusing on localized health promotion.

In examining the psychosocial aspects, Miguel-Berges et al. (2024) illustrate that school-based interventions addressing diet, physical activity, and emotional well-being yield promising results. Their study found improvements in Mediterranean diet adherence and reductions in sugar intake among both normal and overweight children. However, challenges persist in minimizing screen time, especially in the normal-weight group. This study, alongside findings from Mateo-Orcajada et al. (2024), who investigated basic psychological needs and life satisfaction among active versus inactive adolescents, demonstrates the multifaceted nature of obesity interventions. Mateo-Orcajada et al. found that physical activity levels directly influenced satisfaction with life and fulfilment of psychological needs, suggesting that structured PE interventions emphasizing positive psychological reinforcement could bolster obese students' confidence and well-being. Together, these studies reinforce the notion that comprehensive programs addressing physical, emotional, and social dimensions are essential for fostering motivation and self-confidence in obese students within PE. Emerging trends in the literature also reflect an increased focus on gender differences and their impact on motivation and physical engagement among obese students in PE. Meanwhile, Ortín et al. (2024) observed that gender-specific responses to social interaction in PE are significant, with girls and boys showing different levels of competitiveness and cooperation preferences, albeit with minor variations by BMI category. Similarly, Wang et al. (2024) identified seasonal differences in activity behaviors based on gender, showing that boys and girls exhibit unique physical and sedentary activity patterns across academic terms and holidays, potentially impacting their health outcomes. These findings emphasize the need for gender-sensitive approaches in designing PE programs to optimize engagement and motivational outcomes for both genders. Moreover, Mateo-Orcajada et al. (2024) suggested that while physical activity is crucial for adolescent well-being, weight status alone does not determine psychological satisfaction, further reinforcing the need to consider both gender and psychological well-being in obesity-related interventions.

The literature consistently indicates that motivation and self-confidence in PE settings are influenced by a combination of social and environmental factors, particularly among obese students. González-Delgado et al. (2024) argue that social inclusion plays a crucial role in shaping students' attitudes toward physical activity. Their findings suggest that integrating social support mechanisms in PE could mitigate the negative self-perceptions often associated

with obesity, thereby enhancing motivation and engagement. This is supported by Ortín et al. (2024), who noted a preference for social interaction in cooperative settings, suggesting that incorporating cooperative learning models in PE might reduce stigmatization and build a supportive environment for obese students. The literature highlights support systems within PE may result in decreased participation rates and hindered self-confidence among obese students, further underscoring the need for intervention. An evident gap in current research lies in the lack of longitudinal studies examining the sustained impact of PE-based interventions on obese students' motivation and self-confidence. Although studies by Miguel-Berges et al. (2024) and Mateo-Orcajada et al. (2024) demonstrate immediate benefits from lifestyle interventions, there is limited evidence of their long-term effects. Furthermore, most of the research focuses on short-term assessments, with minimal analysis of how interventions influence obese students' motivation and self-confidence over an extended period. This gap highlights an opportunity for future studies to explore the longitudinal outcomes of PE interventions, enabling educators and policymakers to better understand and address the enduring needs of obese primary school students in PE. While there is substantial evidence supporting the positive impact of physical activity on motivation, self-confidence, and physical well-being among primary school students, existing research has certain limitations and gaps. Most notably, studies often fail to address the unique needs of obese children within the PE context, indicating a pressing need for further research on tailored interventions and program structures that foster a supportive environment for these students. Future studies should aim to develop innovative PE programs that incorporate psychological and social support elements, leveraging family and school environments to maximize motivation and self-confidence in obese primary school students.

Research Questions

- What are the trend / What are the research trends in online learning studies according to the year of publication?
- What are the most influential authors?
- Who are the top 10 authors based on citation by research?
- What is the Co-Authorship status?
- What are the popular keywords related to the study, and have they evolved/changed during the last two decades?

Methodology

Bibliometrics means the combination, management and investigation of bibliographic information obtained from publications which are scientific in nature (Alves et al., 2021; Assyakur & Rosa, 2022; Verbeek et al., 2002). Along with general descriptive statistics, such as publishing journals, publication year and main author classification (Wu & Wu, 2017), it also comprises complex techniques, such as document co-citation analysis. A successful literature review necessitates an iterative process involving the identification of appropriate keywords, a literature search, and a thorough analysis to build a comprehensive bibliography and yield dependable results (Fahimnia et al., 2015). Considering this, the study sought to focus on top-tier publications, as they offer valuable insights into the theoretical perspectives shaping the evolution of the research domain. To ensure data reliability, the study relied on the SCOPUS database for data collection (Al-Khoury et al., 2022; di Stefano et al., 2010; Khiste & Paithankar, 2017). Moreover, in order to ensure the inclusion of high-quality publications, only articles published in rigorously peer-reviewed academic journals were considered, with a deliberate exclusion of books and lecture notes (Gu et al., 2019). Notably, Elsevier's Scopus,

known for its extensive coverage, facilitated the collection of publications spanning from 2020 to December 2023 for subsequent analysis.

Data Search Strategy

The study utilized a structured search strategy to retrieve relevant articles from the Scopus database. An initial search was conducted with a focus on terms related to obese students and their well-being in primary or elementary school physical education settings. The final search string incorporated keywords such as “obese students” or “overweight children,” combined with terms like “physical well-being,” “emotional support,” “self-confidence,” and “motivation.” To ensure specificity, only articles published in English from 2004 to 2024 were included. This refined search yielded 1,041 articles for bibliometric analysis, as detailed in Table 1. All relevant articles from Scopus were included as of November 2024.

Table 1

The Search String.

Scopus	("obese students" OR "overweight children") AND ("physical well-being" OR "emotional support" OR "self-confidence" OR "motivation") AND ("primary school" OR "elementary school" OR "physical education") AND PUBYEAR > 2003 AND PUBYEAR < 2025 AND (LIMIT-TO (LANGUAGE, "English"))
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Table 2

The Selection Criterion Is Searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2004 – 2024	< 2024

Data Analysis

VOSviewer is a user-friendly bibliometric software developed by Nees Jan van Eck and Ludo Waltman at Leiden University, Netherlands (van Eck & Waltman, 2010, 2017). Widely utilized for visualizing and analyzing scientific literature, the tool specializes in creating intuitive network visualizations, clustering related items, and generating density maps. Its versatility allows for the examination of co-authorship, co-citation, and keyword co-occurrence networks, providing researchers with a comprehensive understanding of research landscapes. The interactive interface, coupled with continuous updates, ensures efficient and dynamic exploration of large datasets. VOSviewer's ability to compute metrics, customize visualizations, and its compatibility with various bibliometric data sources make it a valuable resource for scholars seeking insights into complex research domains.

One of the standout features of VOSviewer is its capacity to transform intricate bibliometric datasets into visually interpretable maps and charts. With a focus on network visualization, the software excels in clustering related items, analyzing keyword co-occurrence patterns, and generating density maps. Researchers benefit from its user-friendly interface, enabling both novice and experienced users to explore research landscapes efficiently. VOSviewer's continuous development ensures it remains at the forefront of bibliometric analysis, offering valuable insights through metrics computation and customizable visualizations. Its adaptability to different types of bibliometric data, such as co-authorship and citation networks, positions VOSviewer as a versatile and indispensable tool for scholars seeking deeper understanding and meaningful insights within their research domains.

Datasets containing details such as publication year, title, author names, journal, citations, and keywords in PlainText format were obtained from the Scopus database, covering the period from 2004 to December 2024. These datasets were analyzed using VOSviewer software (version 1.6.20), leveraging its clustering and mapping functionalities. VOSviewer employs a visualization approach that positions items within low-dimensional spaces, ensuring their relative proximity accurately reflects their degree of similarity and relatedness, offering an alternative to the Multidimensional Scaling (MDS) method (van Eck & Waltman, 2017) (Appio et al., 2014). Diverging from MDS, which primarily engages in the computation of similarity metrics like cosine and Jaccard indices, VOS utilizes a more fitting method for normalizing co-occurrence frequencies such as the association strength (AS_{ij}), and it is calculated using (Van Eck & Waltman, 2007):

$$AS_{ij} = \frac{C_{ij}}{W_i W_j}$$

Unlike MDS, which primarily calculates similarity metrics such as cosine and Jaccard indices, VOSviewer utilizes normalization techniques, such as association strength (AS_{ij}), to process co-occurrence frequencies. As described by Van Eck and Waltman (2010), association strength is defined as "proportional to the ratio between the observed number of co-occurrences of items *i* and *j* and the expected number of co-occurrences under the assumption of statistical independence" (p. 531). Using this index, VOSviewer generates spatial maps by minimizing the weighted sum of squared distances among item pairs. Additionally, the LinLog/modularity normalization was applied as recommended by Appio et al. (2016). By employing visualization techniques, the analysis revealed mathematical patterns within the data, enabling keyword co-occurrence, citation, and co-citation analyses. Keyword co-occurrence analysis, as highlighted by Zhao (2017), is instrumental in exploring the development of research areas over time and identifying trending topics across disciplines (Li et al., 2016). Citation analysis, on the other hand, provides insights into key research issues, emerging trends, methodologies, and the historical evolution of a field's primary focus (Allahverdiyev & Yucesoy, 2017). Document co-citation analysis, a widely used bibliometric technique (Appio et al., 2016; Fahimnia et al., 2015; Liu et al., 2015), generates maps based on network theory to uncover the structural relationships within datasets (Liu et al., 2015).

Result And Finding

What Are The Research Trends In Motivation, Self-Confidence, And Well-Being In Primary School Students According To The Year Of Publication?

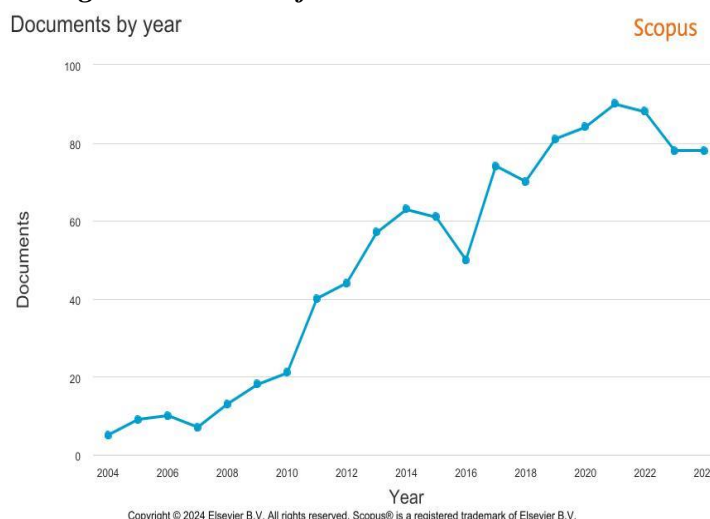


Figure 1: Plotting Document Publication By Years.

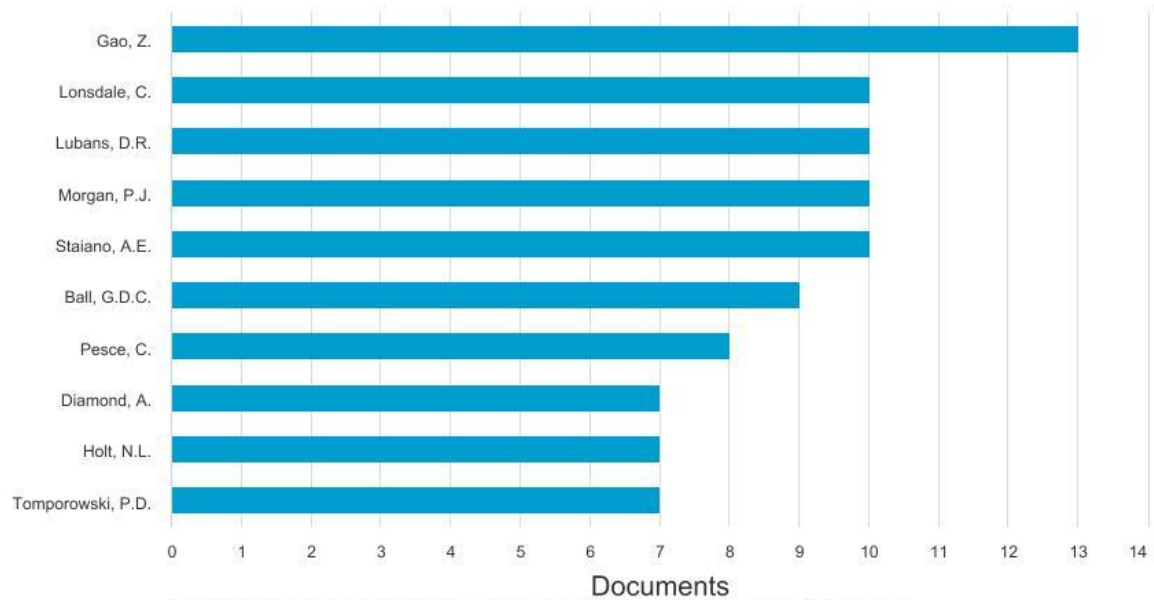
The publication trend in research related to "Motivation, Self-Confidence, and Physical Well-Being Among Obese Primary School Students in Physical Education" from 2004 to 2024 shows a notable increase over the years, as illustrated by the graph. From 2004 to approximately 2011, the output of publications remained relatively low, with fewer than 20 documents per year, suggesting limited initial interest or recognition of this specific research area. However, starting around 2012, there was a significant upward trend in publications, with a sharp increase in research output peaking between 2016 and 2018. This period likely reflects growing awareness of the importance of addressing obesity and psychological well-being in primary education, especially with global discussions on health and physical education reforms. The trend slightly stabilizes after 2018, maintaining a high output of around 60–80 documents annually until 2024, with a slight decline observed towards the latest years. This slight dip may reflect shifting research priorities or emerging challenges in maintaining consistent funding and interest in the field. Nevertheless, the overall growth from 2004 to 2024 highlights a sustained academic interest in the topic, possibly due to increased concerns over childhood obesity and the impact of self-confidence and motivation on students' health and academic performance in physical education settings. This bibliometric analysis underscores the need for continuous research efforts in developing effective strategies to enhance physical well-being and self-confidence among obese primary school students.

Who Writes The Most Cited Articles?

Documents by author

Compare the document counts for up to 15 authors.

Scopus



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Figure 2: The Most Cited Articles

Table 3: The Most Cited Articles

Author Name	Number Of Document	Percentages %
Gao, Z.	13	1.24
Lonsdale, C.	10	0.96
Lubans, D.R.	10	0.96
Morgan, P.J.	10	0.96
Staiano, A.E.	10	0.96
Ball, G.D.C.	9	0.86
Pesce, C.	8	0.76
Diamond, A.	7	0.67
Holt, N.L.	7	0.67
Tomporowski, P.D.	7	0.67
Calvert, S.L.	6	0.57
Colella, D.	6	0.57
Eather, N.	6	0.57
Lau, P.W.C.	6	0.57
Li, W.	6	0.57

The bibliometric analysis data highlights the leading contributors in research on "Motivation, Self-Confidence, and Physical Well-Being Among Obese Primary School Students in Physical Education." Gao, Z. emerges as the most prolific author, contributing 13 documents, which represents 1.25% of the total publications in this domain. Gao's work has likely had a

significant influence on this field, potentially addressing various aspects of physical education (PE) interventions, motivational strategies, and psychological well-being in the context of obesity. Following Gao, authors like Lonsdale, C., Lubans, D.R., Morgan, P.J., and Staiano, A.E. each contributed 10 documents (0.96%). These authors' contributions suggest an emphasis on intervention-based studies that may focus on strategies to enhance physical activity, self-efficacy, and healthy behaviours among children, especially those facing obesity challenges. Further down the list, Ball, G.D.C., with nine documents (0.86%), and Pesce, C., with eight documents (0.77%), continue to add to the body of knowledge. Their works may provide insights into different frameworks or methodologies applied in PE settings to support motivation and self-confidence in obese students. These authors' publications could explore various psychosocial aspects and how structured physical activities contribute to improved well-being. The representation of these authors also highlights a collaborative focus in this research area, where multiple researchers are addressing similar themes in child health, motivation, and educational settings, contributing to a cumulative understanding of effective interventions. Notable contributors with seven documents each, such as Diamond, A., Holt, N.L., and Tomporowski, P.D., focus on cognitive and psychological perspectives within PE. Their studies might examine the role of physical education in supporting cognitive development, psychological resilience, and confidence in children, especially those with obesity-related challenges. This distribution of publications across prominent authors indicates a diverse range of expertise within this research area, from behavioural psychology to PE curriculum design. Collectively, these authors' research underscores the interdisciplinary nature of addressing obesity, motivation, and well-being in primary school PE, suggesting that future research might benefit from integrated approaches that draw upon these varied perspectives.

Who Are The Top 10 Authors Based On Citation By Research?

Table 4: Details of Primary Data for Top 10 Highest Citation

Authors	Title	Year	Source Title	Cited by
(Waters et al., 2011)	Interventions for preventing obesity in children	2011	Cochrane Database of Systematic Reviews	1172
Diamond A.; Ling D.S.	Conclusions about interventions, programs, and approaches for improving executive functions that appear justified and those that, despite much hype, do not	2016	Developmental Cognitive Neuroscience	711
Gard M.; Wright J.	The obesity epidemic: Science, morality and ideology	2004	The Obesity Epidemic: Science, Morality and Ideology	648
Diamond A.	Activities and Programs That Improve Children's Executive Functions	2012	Current Directions in Psychological Science	493

(Dobbins et al., 2009)	School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6-18	2009	Cochrane Database of Systematic Reviews	659
(Robinson et al., 2015)	Motor Competence and its Effect on Positive Developmental Trajectories of Health	2015	Sports Medicine	884
Diamond A.	Executive functions	2013	Annual Review of Psychology	8323
(Glickman et al., 2012)	Accelerating progress in obesity prevention: Solving the weight of the nation	2012	Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation	552
(Kumanyika et al., 2008)	Population-based prevention of obesity: The need for comprehensive promotion of healthful eating, physical activity, and energy balance: A scientific statement from American Heart Association Council on Epidemiology and Prevention, Interdisciplinary Committee for Prevention (formerly the expert panel on population and prevention science)	2008	Circulation	544
(Dobbins et al., 2013)	School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6 to 18	2013	Cochrane Database of Systematic Reviews	495

The bibliometric data on the top 10 most cited works in research related to "Motivation, Self-Confidence, and Physical Well-Being Among Obese Primary School Students in Physical Education" highlights influential studies across various facets of obesity prevention, executive functions, and physical activity promotion in children. Waters et al.'s (2011) study, with 1,172 citations published in the *Cochrane Database of Systematic Reviews*, is the most cited work. This comprehensive review focuses on interventions for preventing obesity in children, making it a crucial resource for developing and evaluating school-based programs that enhance physical activity and improve self-efficacy in managing weight. Similarly, Robinson et al. (2015), with 884 citations, emphasize the importance of motor competence and its positive impact on children's developmental health trajectories, aligning closely with the objectives of promoting physical and psychological well-being in obese students within PE classes. Another influential author, Diamond, has multiple highly cited studies in this domain. Diamond's 2013 review on executive functions, cited 8,323 times in the *Annual Review of Psychology*, and her 2016 study on interventions for improving executive functions, cited 711 times, both

underscore the link between cognitive development and physical activities that enhance self-confidence and motivation. Diamond's work suggests that specific activities in PE can be instrumental in improving executive functioning, an important factor for supporting self-confidence and motivation among obese students. Her research highlights the broader cognitive benefits of physical education, positioning it as a tool not just for physical health but for comprehensive developmental support. Other highly cited studies include Gard and Wright's (2004) book *The Obesity Epidemic: Science, Morality, and Ideology*, 648 times, which critiques societal views on obesity and the moral implications of obesity interventions. Additionally, Glickman et al. (2012), with 552 citations, emphasize comprehensive strategies for obesity prevention, aligning with frameworks for school-based physical activity and health education. These studies collectively underscore the multifaceted approach needed for addressing obesity in children. They advocate for integrating physical, psychological, and social strategies in PE curricula, which are essential for fostering motivation, self-confidence, and well-being among obese primary school students.

What is the map of Co-Authorship about Motivation, Self-Confidence, and Physical Well-Being Among Obese Primary School Students in Physical Education?

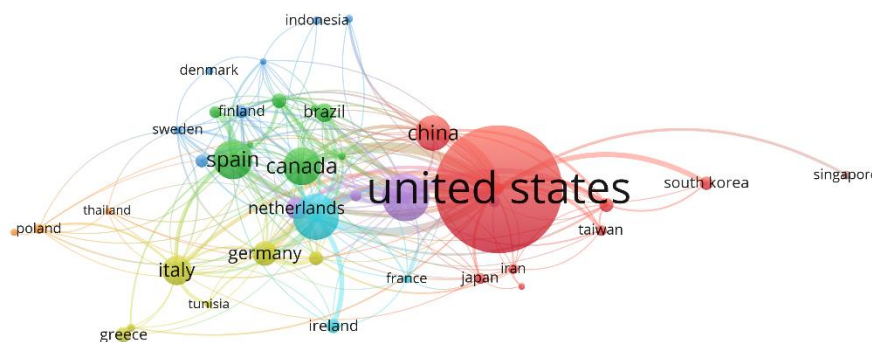


Figure 3: Network visualization map of Co-Authorship

The bibliometric analysis of countries involved in research on "Motivation, Self-Confidence, and Physical Well-Being Among Obese Primary School Students in Physical Education" reveals significant geographic disparities in research contributions and influence. The United States leads significantly, with 403 documents and 17,587 citations, highlighting its role as a central hub for impactful research. This dominance is supported by a total link strength of 176, indicating robust collaborations and influence in the global research network. Other leading countries, such as Australia (104 documents, 6,701 citations) and the United Kingdom (100 documents, 4,946 citations), also demonstrate high productivity and impact, reflecting their commitment to educational and health-related studies. Among other notable contributors, Canada shows a strong citation record (13,196 citations for 77 documents), showcasing high-quality research output. European countries such as Germany (43 documents, 1,659 citations) and the Netherlands (36 documents, 2,001 citations) also stand out, reflecting focused contributions to obesity and education-related studies. Asia's representation, led by China (69 documents, 1,304 citations) and Japan (14 documents, 104 citations), highlights the growing interest in addressing obesity and motivation in education. However, their overall impact remains comparatively lower than their Western counterparts. Interestingly, emerging regions

What Are The Popular Keywords Related To The Study?

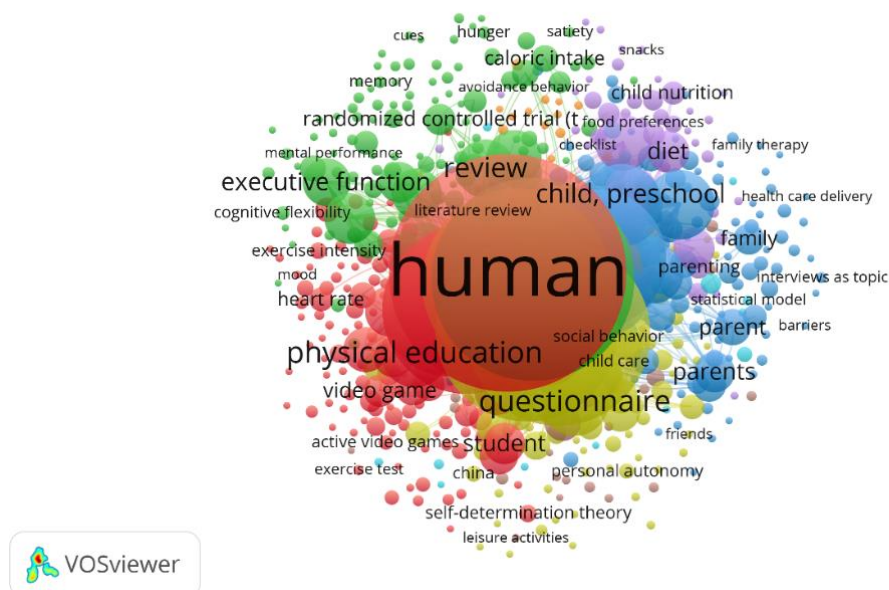


Figure 4: Network Visualization map of keywords' Co-occurrence

Additionally, the presence of keywords related to psychological and behavioural aspects, such as "motivation" (154 occurrences, 3126 total link strength), "self-concept" (72 occurrences, 1837 total link strength), and "health behaviour" (71 occurrences, 1838 total link strength), points to the importance of psychological factors in influencing physical well-being and academic performance. The significant number of keywords related to research methodology, such as "controlled study" (187 occurrences, 4859 total link strength), "randomized controlled trial" (82 occurrences, 2220 total link strength), and "cross-sectional study" (65 occurrences,

1704 total link strength), reflects a strong emphasis on robust research designs in this area. This suggests that studies on childhood obesity and physical education often rely on well-established experimental methodologies to assess the effectiveness of interventions aimed at improving motivation, self-confidence, and overall physical health among primary school students.

Findings and Discussion

The bibliometric analysis of research on "Motivation, Self-Confidence, and Physical Well-Being Among Obese Primary School Students in Physical Education" reveals a significant rise in scholarly attention between 2004 and 2024. From 2004 to around 2011, publication output remained modest, possibly indicating limited early recognition of the topic's relevance. Beginning in 2012, however, publications increased considerably, with a notable peak from 2016 to 2018, likely reflecting growing awareness of childhood obesity and the psychological impacts of physical education (PE). This growth stabilized somewhat post-2018, with annual publications maintaining high levels. A slight recent decline might suggest shifting research priorities, yet the enduring interest highlights continued concern over childhood health issues in educational settings.

The analysis also emphasizes key contributors who have shaped the field, with prominent authors focusing on PE-based interventions and psychological well-being. Leading figures have explored strategies to boost physical activity, self-confidence, and resilience among obese children, reflecting a collaborative, interdisciplinary approach. Studies on motor skills, cognitive development, and social aspects within PE curricula have been highly cited, showing the interconnectedness of physical and mental health in addressing obesity. Collectively, this body of research points to the importance of multifaceted approaches in PE that incorporate physical, psychological, and social components, suggesting future research may benefit from holistic strategies that draw on these diverse insights.

The bibliometric analysis indicates a strong global focus on research related to motivation, self-confidence, and physical well-being among obese primary school students in physical education. The United States stands out as a major contributor to this field, with a substantial number of publications and citations. Other countries like Australia and the United Kingdom also contribute significantly, demonstrating consistent research output and collaboration. While Western countries dominate, nations in Asia, such as China and Japan, are beginning to show interest in this area, though their influence remains limited compared to their Western counterparts. Emerging regions, including Brazil and Malaysia, offer opportunities for growth in both research output and international collaboration.

The key themes identified in the bibliometric data underscore the central role of human health, obesity, and physical activity in this research area. Keywords related to physical health, such as obesity, physical activity, and physical fitness, highlight the importance of addressing childhood obesity through active interventions. Psychological factors, including motivation and self-concept, are also crucial in shaping students' physical well-being and academic performance. Additionally, the frequent mention of research methodologies like controlled studies and randomized trials suggests a focus on rigorous scientific approaches to evaluating the effectiveness of physical education interventions. This comprehensive analysis emphasizes the ongoing need for evidence-based strategies to improve the health and well-being of obese primary school students.

Conclusion

This research highlights a steady rise in the subject of childhood obesity and its psychological and physical implications from 2004 to 2024, with a notable surge in publications post-2012, peaking between 2016 and 2018. The heightened research output during this period underscores growing recognition of the significant impact of obesity on children's mental health and the critical role of targeted physical education interventions. Prominent contributors to this field include the United States, Australia, and the United Kingdom, which collectively lead in research output. Meanwhile, countries such as China and Japan, along with emerging contributors like Brazil and Malaysia, are increasingly engaging in this research domain. Thematically, the focus centres on human health, physical fitness, and psychological factors like motivation and self-concept. The prevalence of controlled studies and randomized trials highlights the field's commitment to evidence-based practices in evaluating intervention effectiveness. This analysis underscores the imperative for holistic and interdisciplinary strategies within physical education to address both the physical and psychological well-being of obese primary school students. Furthermore, it emphasizes the importance of sustained global research collaboration to advance understanding and develop effective interventions.

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