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A Qualitative Exploration of Postgraduates' KAP toward Health: Applying the BOPPPS Teaching Model in Physical Education

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Abstract

This study investigates how postgraduate students experience cognitive, attitudinal, and behavioral transformation through participation in a physical education course structured by the BOPPPS teaching model. Drawing upon the Knowledge–Attitude–Practice (KAP) framework, the research aims to explore how structured, reflective, and participatory instruction fosters health literacy and sustainable health behavior in higher education. A qualitative research design was employed, involving semi-structured interviews with thirty postgraduate students at a comprehensive university in northern China. The course was implemented over eight weeks, with four instructional hours per week, following the six sequential stages of the BOPPPS model: Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, and Summary. Data were analyzed thematically to identify recurring patterns related to knowledge acquisition, attitude development, and behavioral change. Three major themes emerged. First, students reported significant growth in health knowledge, developing a deeper understanding of the interconnections between physical, mental, and social well-being. Second, they experienced a positive attitude shift, expressing greater motivation and emotional engagement toward exercise through collaborative and reflective learning activities. Third, they demonstrated behavioral change, adopting regular exercise routines and self-regulation strategies that extended beyond the classroom. The findings confirm that integrating the BOPPPS model with the KAP framework provides an effective pedagogical–behavioral continuum for promoting holistic well-being. Theoretically, the study advances understanding of how structured pedagogy can operationalize behavioral health theories in postgraduate education. Practically, it offers a replicable model for designing student-centered physical education courses that enhance motivation, reflection, and sustainable practice, thereby supporting national goals such as Healthy China 2030.

Keywords: BOPPPS Teaching Model, Knowledge–Attitude–Practice (KAP) Framework, Postgraduate Students, Physical Education, Qualitative Study, Health Promotion

Introduction

Health promotion has become a central objective in global education and development agendas, reflecting the recognition that physical, psychological, and social well-being are essential to human capital and national progress (Liu *et al.*, 2024). The World Health

Organization (WHO, 2023) emphasizes integrating health literacy and preventive education across all schooling levels, including higher education (Organization, 2023). Universities are thus expected to cultivate not only intellectual and professional skills but also lifelong health management capacities. The "healthy universities" concept has gained prominence, highlighting how campus environments and curricula shape young adults' health behaviors and attitudes (Dorfman-Furman, 2024).

In China, this aligns with the Healthy China 2030 blueprint, which integrates physical education (PE), health literacy, and psychological resilience into the academic system (Dong *et al.*, 2025). While undergraduate programs have advanced rapidly, postgraduate PE remains underexplored despite students' unique challenges: prolonged sedentary habits, academic pressure, irregular schedules, and stress-related fatigue that undermine physical and emotional stability (Dirisala *et al.*, 2025). Strengthening postgraduate health education is thus an urgent priority in graduate training reform.

The Knowledge–Attitude–Practice (KAP) framework provides a robust model for health behavior change, positing that knowledge acquisition fosters attitudes, which then drive practices (Chen *et al.*, 2025). To apply this in classrooms, the BOPPPS model (Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, Summary) offers a structured, student-centered approach with built-in feedback (Zeng *et al.*, 2025). Its stages align with KAP: knowledge via guided learning, attitudes through participation, and practices via reflection.

Despite policy support and pedagogical innovations, the link between structured models like BOPPPS and postgraduate health behavior transformation is underexplored. Existing studies are mostly quantitative, measuring outcomes like fitness gains without examining underlying cognitive and experiential processes. Qualitative insights are needed to reveal how PE design facilitates learning, reflection, and sustained change.

This study contribution Statement is novel in qualitatively integrating the BOPPPS pedagogical model with the KAP framework to unpack postgraduate students' experiential transformations in health behaviors a gap in social science research on higher education health promotion. It contributes theoretically by elucidating pedagogy–behavior interactions, empirically through rich insights into knowledge–attitude–practice shifts, and practically via a replicable, student-centered PE approach supporting China's healthy postgraduate education goals.

The study examines how BOPPPS-based PE courses promote postgraduates' KAP transformations in health awareness, emotional engagement, and self-regulated behaviors. It pursues three objectives:

Objective 1 – Knowledge: Explore how students perceive, understand, and apply health knowledge via BOPPPS.

Objective 2 – Attitude: Examine evolving health attitudes, motivations, and values through participatory experiences.

Objective 3 – Practice: Identify translation of knowledge and attitudes into daily self-regulated health behaviors.

By achieving these objectives, this study contributes to the expanding field of health education in higher learning. Theoretically, it deepens the understanding of how pedagogical design and behavioral theory interact by integrating the BOPPPS model with the Knowledge–Attitude–Practice framework into a coherent analytical structure. Empirically, it provides qualitative insights into how postgraduate students acquire health knowledge, reshape their attitudes, and translate these changes into consistent health practices. Practically, the study proposes a replicable and student-centered approach to physical education that fosters cognitive growth, positive health attitudes, and sustainable behavioral engagement, thereby supporting the broader national vision for healthy and high-quality postgraduate education.

Literature Review

The BOPPPS Teaching Model in Higher Education

The BOPPPS teaching model, first conceptualized in the late 20th century, represents a systematic and student-centered instructional framework that promotes structured learning and reflective engagement. Its six sequential stages—Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, and Summary—guide the teaching process from preparation to reflection. Each phase is designed to support cognitive activation, interaction, and feedback, creating a closed learning loop that enhances student comprehension and motivation.

In higher education, BOPPPS has been increasingly adopted across disciplines such as medicine, nursing, language education, and engineering. Recent meta-analytic evidence shows that the model consistently improves academic performance, participation, and satisfaction compared to traditional lecture-based teaching (Zhu et al., 2025). In clinical and health education contexts, BOPPPS significantly enhanced students' exam scores, learning engagement, and perceived relevance of content, although its influence on higher-order thinking skills remains mixed. Similarly, classroom-based applications in English language learning (Jiang & others, 2023) have shown that its structured yet flexible design promotes deeper engagement and encourages reflective thinking.

More recently, Qu & Wang (2023) found that the BOPPPS assessment framework not only clarifies learning objectives and provides timely feedback but also stimulates critical thinking, creativity, and the development of innovation-oriented skills. These findings collectively underscore the adaptability and cross-disciplinary value of the model.

Specifically, students' interest in learning has been greatly improved, their enthusiasm for sports has become fuller, and their participation in sports has also been significantly improved (Miao et al., 2019). More importantly, students' mastery of sports knowledge has also been significantly improved, which is undoubtedly conducive to their better understanding and mastery of relevant skills and knowledge (Qu & Wang, 2023).

The Knowledge–Attitude–Practice (KAP) Framework and Health Behavior

The Knowledge-Attitude-Practice (KAP) framework is a well-known theoretical underpinning for studying behavior formation and health education outcomes. It proposes a sequential relationship between three components: knowledge acquisition establishes the cognitive foundation, which develops attitudes (the emotional component), and these attitudes drive behavioral behaviors. The KAP framework, which was originally created for

public health research, has been used to evaluate and advise interventions in nutrition, disease prevention, mental health, and physical activity (Moitra *et al.*, 2021).

In educational settings, the KAP framework provides a useful lens for understanding how students acquire and adopt health-related behaviors (Chaiprakarn & Kaewnaknaew, 2024). Knowledge raises awareness and self-efficacy, while positive attitudes boost intrinsic motivation, and repetition solidifies behavioral routines (Sun *et al*., 2022). According to research, successful health education needs more than just information transfer; it also requires students to internalize meaning and engage emotionally. In physical education, this means that kids must not only grasp the value of exercise, but also cultivate positive attitudes that encourage consistent participation.

Previous KAP-based studies, on the other hand, have primarily used quantitative approaches such as surveys, which record correlations but fail to discover the fundamental cognitive and affective factors behind behavior change. Furthermore, few research have investigated how structured pedagogical interventions, such as BOPPPS, can aid in the transition between the three KAP dimensions. Integrating KAP into teaching practice provides a promising avenue for researching how instructional design contributes to overall health development.

Integrating BOPPPS and KAP: A Pedagogical–Behavioral Link

Although the BOPPPS and KAP frameworks come from different disciplinary traditions, specifically pedagogy and mental health, they have a shared logic based on development, reflection, and transformation (Zhu *et al*., 2025). The BOPPPS paradigm establishes an organized educational procedure, whereas the KAP framework outlines a defined behavioral modification strategy. When these two frameworks are merged, they form an integrated pedagogical and behavioral continuum that can inform the design and evaluation of health education programs.

In this integration, each BOPPPS step can be mapped to KAP stages. The Bridge-in and Objective stages correspond to knowledge acquisition, assisting learners in connecting existing understanding with new material and establishing relevant goals. Participatory Learning is consistent with attitude building because students actively engage in activities that promote emotional connection and motivation. Finally, the post-assessment and summary are related to practice, which reinforces behavioral consolidation through feedback and reflection. This mapping converts abstract theory into practical teaching, giving educators a reproducible structure for health promotion in higher education.

Recent studies in medical and nursing education confirm that this dual framework enhances both learning engagement and health literacy (Zhu *et al*., 2025). Similarly, in language and PE teaching, BOPPPS-based activities have been shown to strengthen learners' self-regulation and collaborative learning skills (Jiang & others, 2023). Yet, despite this conceptual alignment, empirical research explicitly analyzing BOPPPS–KAP integration remains limited, especially in postgraduate settings. Understanding how this integration operates in practice—through students' lived experiences, reflections, and behavior—can reveal new insights into how education facilitates long-term well-being.

Postgraduate Health Education in the Chinese Context and Research Gap

The Healthy China 2030 policy, which is part of China's educational reform plan, emphasizes the necessity of combining physical education, mental health, and lifestyle management in higher education. While undergraduate programs have implemented a variety of modifications to achieve these aims, postgraduate PE remains underdeveloped. According to research, many postgraduate students suffer from diminishing physical fitness, psychological stress, and irregular exercise habits because of their academic workload and lifestyle constraint (Guo *et al.*, 2022). The absence of systematic health education programs in postgraduate curriculum frequently leads in insufficient awareness of health management and poor behavioral consistency (Bhanwar Singh Champawat, 2025).

Although some colleges have established elective or mandatory PE classes, most evaluations focus on physical performance or satisfaction, ignoring the cognitive-affective-behavioral transformations that underpin health improvement. Quantitative studies utilizing instruments such as the Self-Rated Health Measurement Scale (SRHMS) have demonstrated improvements in physical and mental health following course participation, but these results offer little insight into how such changes occur. In contrast, a qualitative method can capture learners' subjective experiences and meaning-making processes, shedding light on how structured educational interventions promote long-term health development.

This study thereby addresses a significant research gap. It combines pedagogical design (how teaching is structured) and behavioral results (how students' knowledge, attitudes, and behaviors grow) by investigating the narratives of postgraduate students in BOPPPS-based PE courses. The study makes a theoretical contribution by expanding KAP application to pedagogical situations, and it provides a practical model for building reflective, student-centered PE courses that correspond with China's national aim of cultivating "healthy and high-quality talent."

Methodology

Research Design

This study used a qualitative research design based on the interpretivist paradigm, which aims to comprehend participants' lived experiences and the meanings they get from them. The goal was to investigate how postgraduate students perceive and experience changes in their health knowledge, attitudes, and practices after enrolling in a BOPPPS-based physical education (PE) course. A qualitative technique was deemed acceptable because it allows for in-depth exploration of subjective reflections and emotional alterations that cannot be fully captured by quantitative methods (Creswell, 2008).

The primary data gathering strategy was semi-structured interviews, which allowed participants to express themselves freely while also allowing the researcher to examine developing themes. Braun & Clarke, (2012) defined thematic analysis as the process of identifying reoccurring patterns and groupings within data. This methodology guaranteed that participants' voices were fundamental to the interpretation while also offering a methodical mechanism for connecting their experiences to the conceptual frameworks of BOPPPS and KAP.

Research Context and Participants

The study was carried out at a large public institution in northern China that provides compulsory and elective physical education courses to postgraduate students. The selected PE course was planned and implemented in accordance with the BOPPPS teaching paradigm, with the goal of increasing students' holistic health literacy. The course lasted eight weeks and required four academic hours per week. It included a variety of activities such as aerobic training, stretching and yoga sessions, teamwork-based sports, and health theory discussions.

Thirty postgraduate students freely took part in the study. The sample includes 21 female and 9 male students aged 23 to 28, representing a variety of academic areas such as engineering, education, management, and social sciences. A selective sampling technique was utilized to ensure gender diversity, academic background, and past experience with physical activity. Participation was entirely voluntary, with all respondents providing written informed consent prior to the interviews. To ensure secrecy, pseudonyms were used in all transcripts and reports.

Data Collection

Data were gathered through semi-structured interviews performed after the training was completed. Each interview lasted about 40 to 60 minutes and was conducted either in person or over an encrypted online platform, depending on the participants' availability. The interview protocol was built using the three dimensions of the KAP framework:

a. Health knowledge acquisition and understanding,
b. Changes in health attitudes and motivation, and
c. Health practices and behavioral regulation.

The guide also asked students about their experiences with the BOPPPS teaching approach, such as which class activities they found most interesting or useful for reflection. Follow-up questions were utilized to obtain more extensive explanations and examples.

The researcher conducted all interviews in Chinese and recorded them with the subjects' consent. The recordings were transcribed verbatim and translated into English for examination. To ensure translation accuracy, two bilingual researchers cross-checked the transcripts and made necessary revisions. The questions of interview shown below:

Section 1 – Health Knowledge Acquisition and Understanding (Knowledge)

1. What new knowledge about health, exercise, or well-being did you gain from this course?
2. How did this knowledge help you better understand the relationship between physical activity and mental health?
3. Which teaching methods or activities helped you understand or remember health-related content most effectively?
4. Were there particular moments in class (for example, introductions, goal statements, discussions, or summaries) that made learning clearer or more meaningful to you?
5. Can you give an example of one health concept or idea that changed your way of thinking about your own health?

Section 2 – Changes in Health Attitudes and Motivation (Attitude)

1. Before taking this course, how would you describe your general attitude toward exercise and physical education?

2. After completing the course, have your feelings or attitudes toward exercise and health changed? In what ways?
3. Which parts of the class made you feel more motivated, confident, or emotionally engaged?
4. Did you find that participating in the course helped you relieve academic stress or improve your emotional well-being?
5. How has your understanding of "being healthy" evolved since taking the course?

Section 3 – Health Practices and Behavioral Change (Practice)

1. Since finishing the course, have you made any changes to your daily habits or exercise routines?
2. Have you tried to create a regular workout plan or healthier lifestyle?
3. Did feedback, self-reflection, or peer interaction in the course encourage you to keep exercising?
4. Have these new practices influenced your study efficiency, concentration, or mood?
5. What factors help you maintain these health behaviors, and what obstacles make it difficult to continue?

Data Analysis

Coding is an important step in this study because it allows themes to emerge from the raw data by highlighting important data points. Prior to interpretation, key moments identified were coded. Interpretation of the coded data includes comparison of theme frequencies, identification of co-occurrence of themes, and visualization of correlations between different themes (Guest *et al*., 2011). The details of the phrases can be found in Table 3.1.

Table 3.1
Phase of Braun and Clarke's Thematic Analysis

No.	Phase	Description
1.	Familiarizing yourself with your data	The first step is to translate the spoken language from the interview into words. This stage is a very important process to get familiar with the content of the interview.
2.	Generating initial codes	Code intriguing data features in a methodical way across the data set, collecting data relevant to each code.
3.	Theme development	Organize and summarize existing codes and group different codes under different potential themes.
4.	Reviewing potential themes	Check if there are codes that cannot be grouped under one theme.
5.	Defining and naming themes	In this phase, a more detailed analysis of each theme is done. Further analysis will determine what aspect of the data is included in each theme.
6.	Producing the report	Introduce more descriptive examples from the data and organize them into an analysis report.

Trustworthiness

To achieve credibility and dependability, the study adopted multiple strategies recommended for qualitative research.

Credibility: Participants were asked to check summaries of their interview transcripts to ensure correctness and authenticity.

Dependability: The study methodologies were thoroughly documented so that they could be replicated.

Confirmability: The researcher demonstrated reflexivity by taking field notes and reflecting on own biases during data collection and analysis.

Transferability: Readers were given detailed explanations of the research context, participants, and course design to help them determine relevance to different contexts.

Ethical Considerations

All participants were informed of the study's purpose, voluntary nature, and confidentiality procedures. They signed an informed consent form and were reminded that they could withdraw at any point without penalty. The data were stored securely in password-protected files accessible only to the research team. Direct identifiers were removed during transcription, and pseudonyms were used in all reporting to protect participants' privacy.

In summary, this qualitative study employed semi-structured interviews and thematic analysis to explore postgraduate students' health-related knowledge, attitudes, and practices within a BOPPPS-based physical education course. The systematic integration of structured pedagogy and behavioral theory allowed for a comprehensive understanding of how students construct, internalize, and sustain health-oriented behaviors. The next section presents the findings derived from thematic analysis, organized around the major themes that emerged from the data.

Results

Overview of the Analysis

Thematic analysis of the 30 interview transcripts yielded three key themes that characterized the growth of students' cognitive, emotional, and behavioral development across the eight-week physical education course designed using the BOPPPS teaching approach. The themes were consistent with the Knowledge-Attitude-Practice (KAP) framework, demonstrating how students' learning experiences progressed from acquiring health knowledge to developing good health attitudes and, eventually, adopting sustainable health habits. Representative quotes are offered to illustrate each theme while maintaining the authenticity of the participants' voices.

Theme 1- Health Knowledge Growth

Participants reported a substantial increase in their understanding of health-related concepts and self-management skills. Before the course, many admitted that their perception of physical education was limited to basic exercise routines. After experiencing the BOPPPS-based instruction, they expressed deeper awareness of the scientific principles underlying health, including the importance of mental and social balance.

Students highlighted that the Bridge-in and Objective stages helped them recognize the relevance of health knowledge to their daily lives. Through interactive discussions, guided reflections, and pre-assessment activities, they were able to connect theoretical understanding with personal experience.

"Before the class, I thought exercise was just about losing weight. But the lessons explained how physical activity improves emotional balance and academic concentration. It completely changed my idea of what being healthy means." (Participant 07)

"The teacher's explanations and the pre-assessment questions made me realize how little I knew about my own physical condition. I started paying attention to my sleep, nutrition, and mental state." (Participant 14)

This increased awareness not only broadened students' cognitive frameworks, but also encouraged analytical thinking about their own health practices. The structured design of the BOPPPS paradigm allowed for knowledge production through active participation rather than passive receiving.

Theme 2 - Positive Attitude Shift

The second theme reflects a transformation in students' attitudes toward exercise and health. Many participants described how the participatory and reflective aspects of the BOPPPS model increased their motivation and emotional engagement. The Participatory Learning phase, in particular, was frequently mentioned as the turning point that transformed external requirements into intrinsic interest.

"At first, I joined the PE class just to earn credits. But when we did teamwork exercises and shared reflections, I felt inspired by others' enthusiasm. I began to enjoy the process." (Participant 03)

"I used to see exercise as a burden. Now I look forward to the class because it helps me release stress and connect with others. It's not just physical training; it's emotional relief." (Participant 19)

Students reported that they developed a more positive emotional connection with physical activity and started to value health as part of their academic and personal identity. The Post-assessment feedback and Summary sessions allowed them to see measurable progress, reinforcing their sense of achievement and self-efficacy. Overall, the BOPPPS design cultivated an environment where reflective learning and supportive peer interaction strengthened positive attitudes toward health maintenance.

Theme 3- Behavioral Change and Health Practice

The third theme demonstrates how knowledge and attitudes were translated into concrete health practices. After completing the course, participants described adopting more regular exercise routines, better time management, and improved stress-coping strategies. Many continued to exercise independently even after the course ended, indicating the internalization of behavior change.

"I started jogging twice a week after the class. At first it was for the assignment, but now it has become a habit. When I skip it, I feel something is missing." (Participant 12)

"The reflection journals made me think about what I actually do for my health. I began to plan my weekly schedule more carefully and added stretching before study sessions." (Participant 25)

The Summary component of the BOPPPS cycle played an essential role in reinforcing these behaviors, as students used reflective writing and feedback to monitor progress. Several participants also reported positive spillover effects on mental health and study efficiency, noting that consistent physical activity improved their concentration and emotional stability.

Collectively, these behavioral changes illustrate that structured and reflective PE instruction can support sustainable health practices among postgraduate students, bridging the gap between learning and real-life application.

Discussion

This study investigated how postgraduate students' cognitive, attitudinal, and behavioral transformations were influenced by their participation in a physical education course constructed using the BOPPPS teaching paradigm. The findings showed a progressive trajectory that was consistent with the Knowledge-Attitude-Practice (KAP) framework, suggesting that structured, reflective, and student-centered pedagogy can effectively promote health awareness and sustainable lifestyle habits. The discussion below examines the three primary themes in light of previous research and theoretical approaches.

Cognitive Development through Health Knowledge Growth

The first theme, Health Knowledge Growth, illustrates that the acquisition of accurate and relevant health knowledge forms the foundation of behavior change. Participants' reflections indicated that they moved beyond superficial notions of exercise and developed an understanding of health as a multidimensional concept encompassing physical, psychological, and social well-being. This finding is consistent with previous research showing that cognitive engagement in structured learning enhances comprehension and self-awareness in health education (Alam & Mohanty, 2024).

The Bridge-in and Objective stages of the BOPPPS model were particularly influential because they contextualized learning and clarified objectives. Students indicated that these components piqued their interest and related theory to personal experience, demonstrating the activation of prior knowledge that constructivist learning theories promote (Bada & Olusegun, 2015). By integrating new information to living experiences, students were able to comprehend health ideas as personally meaningful rather than abstract principles.

Moreover, the findings highlight that knowledge growth was not limited to factual recall. Participants began to critically evaluate their own health behaviors, demonstrating cognitive internalization. This deeper learning aligns with studies in medical and nursing education showing that BOPPPS promotes higher-order thinking by encouraging questioning, analysis, and self-reflection (Wu *et al*., 2023). The cognitive gains observed here confirm that BOPPPS can serve as an effective mechanism for the knowledge stage of the KAP model, providing the intellectual base necessary for subsequent attitudinal and behavioral change.

Affective Engagement and Positive Attitude Shift

The second theme, Positive Attitude Shift, captures the emotional and motivational transformation that occurred as students participated in interactive and reflective activities. The data revealed that the participatory nature of the course stimulated enjoyment, reduced

resistance to exercise, and strengthened students' emotional connection to health practices. These outcomes support prior research suggesting that active learning and peer interaction increase intrinsic motivation and emotional involvement (Rodriguez *et al.*, 2018).

Attitude formation in this context was closely associated with the Participatory Learning and Post-assessment stages of the BOPPPS model. Through collaboration, students experienced both cognitive resonance and social support, which promoted a sense of belonging and competence. Such experiences align with Ryan & Deci, (2000) self-determination theory, which posits that autonomy, competence, and relatedness foster internal motivation. The structured feedback and reflection activities in BOPPPS addressed these three psychological needs, helping students reframe exercise from a requirement into a self-driven pursuit.

Another noteworthy outcome is the students' redefinition of health as a holistic and lifelong pursuit. Many participants described feeling less anxious about academic pressures and more appreciative of balance and self-care. This insight supports the idea that attitude transformation in health education extends beyond physical aspects to include emotional well-being and identity formation (Feith *et al*., 2018). The participatory and reflective dimensions of BOPPPS thus not only enhanced learning satisfaction but also contributed to psychological resilience.

Translation into Behavioral Change and Health Practice

The third theme, Behavioral Change and Health Practice, provides evidence that structured and reflective instruction can lead to sustained lifestyle improvements. Participants' narratives revealed that they adopted new exercise routines, developed time-management habits, and implemented self-regulation strategies that persisted beyond the course. These findings substantiate the final stage of the KAP model, where knowledge and attitudes are consolidated into consistent practice.

Several mechanisms within the BOPPPS design appear to have facilitated this transformation. The Summary stage provided a formal opportunity for reflection and goal setting, helping students monitor progress and recognize improvement. Post-assessment feedback reinforced accountability and encouraged self-evaluation. This iterative process mirrors the feedback loops emphasized in experiential learning theory, where learning becomes continuous through cycles of action and reflection (Kolb & Kolb, 2018).

Furthermore, participants' reports of improved concentration and emotional balance highlight the reciprocal relationship between physical activity and academic productivity. Regular exercise can enhance cognitive performance and emotional regulation, both of which are crucial for postgraduate success. These findings contribute to the growing body of evidence that supports physical education as an essential component of higher learning rather than a peripheral activity.

Integrative Interpretation of the BOPPPS–KAP Framework

When examined collectively, the three themes form a coherent pattern that supports the theoretical integration of BOPPPS and KAP. The BOPPPS structure provided instructional

scaffolding for students to advance sequentially from comprehension to internalization, while the KAP framework described the psychological principles that underpin this transition.

This study contributes to current literature by empirically proving how each stage of BOPPPS corresponds to a phase of KAP. The Bridge-in and Objective stages aided information acquisition; Participatory Learning and Post-assessment encouraged attitudinal change via interaction and feedback; and Summary promoted behavioral reinforcement through reflection and goal formulation. The integration of these frameworks provides a holistic approach for developing health education that covers cognitive, affective, and behavioral domains at the same time as shown in figure 5.1.

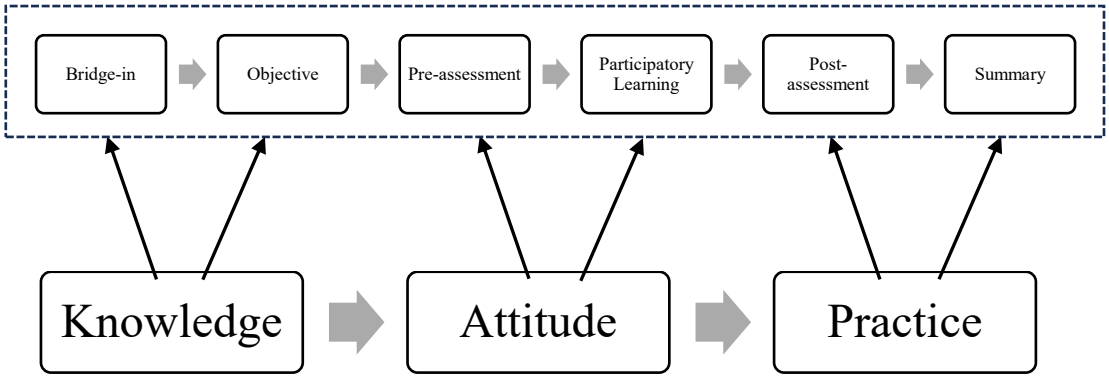

Figure 5.1 Integrative Framework of the BOPPPS–KAP

Limitations and Future Research

While the findings offer valuable insights, several limitations should be acknowledged. The study involved a single institution and a relatively small number of participants, which may limit generalizability. Future research could include longitudinal designs to examine whether behavioral changes persist over time and could compare results across universities and disciplines.

In addition, although this study focused on qualitative data to capture depth of experience, future investigations might employ mixed methods to triangulate findings with quantitative measures such as self-rated health scales or physiological indicators. Exploring the roles of gender, academic pressure, and digital learning tools in moderating the BOPPPS–KAP relationship would also deepen understanding of how structured pedagogy can promote health in diverse postgraduate populations.

Conclusion

This study investigated how taking a physical education course based on the BOPPPS teaching model affected the cognitive, attitudinal, and behavioral changes of postgraduate students. By combining the Knowledge–Attitude–Practice (KAP) model with the BOPPPS framework, the study offered a thorough grasp of how participatory, reflective, and organized instruction supports health promotion in higher education.

The qualitative results showed a distinct developmental sequence in each of the KAP framework's three dimensions. First, via organized education that linked theoretical knowledge with firsthand experience, students' health knowledge significantly increased.

Second, because of reflective involvement, ongoing feedback, and participatory learning, students gained more favorable attitudes regarding exercise and health. Finally, these cognitive and attitudinal transformations were translated into sustainable health practices, such as maintaining regular exercise routines and adopting self-regulation strategies.

The integration of BOPPPS and KAP proved to be a powerful pedagogical mechanism. The BOPPPS model offered a structured pathway for learning and reflection, while the KAP framework explained the psychological mechanisms that drive health-related behavior change. Together, they formed a pedagogical–behavioral continuum that effectively bridged teaching design and health promotion outcomes. This synthesis underscores the importance of aligning instructional methods with behavioral theory to achieve deeper and longer-lasting educational impact.

In conclusion, this study contributes both theoretical and practical insights to the field of health education. Theoretically, it validates the integration of pedagogical and behavioral frameworks for promoting holistic learning. Practically, it provides a replicable model for designing student-centered physical education that nurtures health literacy, motivation, and sustainable practice among postgraduate students. Through structured teaching, reflective learning, and continuous feedback, postgraduate education can play a vital role in shaping not only intellectual excellence but also lifelong well-being.

Reference

Alam, A., & Mohanty, A. (2024). Framework of Self-Regulated Cognitive Engagement (FSRCE) for sustainable pedagogy: A model that integrates SRL and cognitive engagement for holistic development of students. *Cogent Education*, *11*(1), 2363157.

Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *Journal of Research & Method in Education*, *5*(6), 66–70.

Bhanwar Singh Champawat. (2025). *Physical Fitness Among College Students: Trends, Challenges, and Opportunities*. https://doi.org/10.5281/ZENODO.15252241

Braun, V., & Clarke, V. (2012). *Thematic analysis.* American Psychological Association.

Chaiprakarn, S., & Kaewnaknaew, C. (2024). Knowledge, attitude, and practice (behaviour) among health promotion school students. *Advance Knowledge for Executives*, *3*(2), 1–9.

Chen, X., Xiao, F., Miao, Y., Qin, H., Yang, L., Shen, F., & Yuan, X. (2025). Behaviors and influencing factors of Chinese oncology nurses towards frailty care: A cross-sectional study based on knowledge-attitude-practice theory in 2024. *PloS One*, *20*(1), e0313822.

Creswell, J. W. (2008). *Educational research: Planning,conducting and evaluating quatitative and qualitative research(3rd ed.)*. Pearson Education Ltd.

Dirisala, M., Shaju, R. E., & Amalanathan, G. M. (2025). Analyzing sleep and stress patterns in college students. In *Educational philosophy and sociological foundation of education* (pp. 237–258). IGI Global.

Dong, D., He, B., Kong, J., Zhou, A., Lv, M., Zhang, D., & Dong, C. (2025). Can China's national fitness policy contribute to achieving universal health? Analysis based on the three-dimensional framework. *Frontiers in Public Health*, *13*, 1610070.

Dorfman-Furman, G. (2024). Academy's role in fostering lifelong learning and self-development in a knowledge-based society. *2024 IEEE World Engineering Education Conference (EDUNINE)*, 1–4.

Feith, H. J., Gradvohl, E., Darvay, S. M., Lukács, Á. J., Füzi, R., Krekó, I. B., & Falus, A. (2018).

Health education–responsibility–changing attitude. A new pedagogical and methodological concept of peer education. *Acta Universitatis Sapientiae. Social Analysis*, *8*, 55–74.

Guest, G., MacQueen, K. M., & Namey, E. E. (2011). *Applied thematic analysis*. sage publications.

Guo, Y., Li, S., Zhang, L., Xuan, Q., He, L., Ye, Q., Ma, J., Peng, L., Xiong, Y., Yang, J., & others. (2022). Depression and anxiety of medical students at Kunming Medical University during COVID-19: A cross-sectional survey. *Frontiers in Public Health*, *10*, 957597.

Jiang, Q. & others. (2023). Efficient classroom: English teaching design and practice of intensive reading course based on BOPPPS model in ESL class. *Curriculum and Teaching Methodology*, *6*(22), 127–133.

Kolb, A., & Kolb, D. (2018). Eight important things to know about the experiential learning cycle. *Australian Educational Leader*, *40*(3), 8–14.

Liu, S., Sun, M., Zhang, N., Sun, Z., Tian, X., Li, L., & Wang, Y. (2024). Shaping global health promotion: A comprehensive analysis of the 10 global conferences on health promotion conferences (1986–2021). *Global Health Journal*, *8*(2), 91–96.

Miao P., Zhang P., & Li H. (2019). Research on the Application of BOPPPS Teaching Mode in College Public Physical Education Curriculum. *Science Journal of Normal University*, *39*(12), 107–110.

Moitra, P., Madan, J., & Verma, P. (2021). Impact of a behaviourally focused nutrition education intervention on attitudes and practices related to eating habits and activity levels in Indian adolescents. *Public Health Nutrition*, *24*(9), 2715–2726.

Organization, W. H. (2023). *Integrating the social determinants of health into health workforce education and training*. World Health Organization.

Qu, N., & Wang, Q. (2023). BOPPPS Instructional Model Applied to a Basic Economics Course in Higher Education: Design and Assessment. *International Journal of Management Science Research*, *6*(5), 86–93.

Rodriguez, M., Diaz, I., Gonzalez, E. J., & Gonzalez-Miquel, M. (2018). Motivational active learning: An integrated approach to teaching and learning process control. *Education for Chemical Engineers*, *24*, 7–12.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54–67.

Sun, Y., Hong, J.-C., & Ye, J.-H. (2022). The effects of employees' perceived intrinsic motivation on knowledge sharing and creative self-efficacy. *Frontiers in Psychology*, *12*, 762994.

Wu, M., Zhang, L., & Sun, H. (2023). Design of blended teaching model based on BOPPPS model. *2023 5th International Conference on Computer Science and Technologies in Education (CSTE)*, 101–105.

Zeng, X., Xu, W., & Wang, T. (2025). The "three boards" empower the teaching design of general artificial intelligence education. *Journal of Educational Technology and Innovation*, *7*(2).

Zhu, J., Xiao, H., Zhou, R., Gan, X., Gou, Q., & Tie, H. (2025). The efficacy of the BOPPPS teaching model in clinical and health education: A systematic review and meta-analysis. *BMC Medical Education*, *25*, 997.