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HEALTH EDUCATION

Improving School Physical Education: Eight Health Economics Strategies for Health Promotion

Saeed Khanmoradi, Shahrouz Ghayebzadeh, Andrew Sortwell, Emine Busra Yilmaz, Ferman Konukman

Abstract

Students and teachers can participate more peacefully and safely in school sports activities in a healthy environment and physically, mentally, and emotionally healthy. Providing such a healthy space in schools requires numerous infrastructural and conditional prerequisites, with ensuring economic resources for health being essential. Therefore, this article aims to identify practical health economics strategies for developing physical education in schools. Suitable practical health economics strategies may include: integrating health impacts into economic evaluations, developing student insurance as a safety valve, distributive justice in health services, investment in school health infrastructure, encouraging health policies related to transportation,

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empowering teachers and school administrators in health economics, offering financial incentives to schools, and fostering cross-sector collaboration. These strategies can lead to improvements in health infrastructure, increased student participation in sports activities, and enhancement of the quality of physical education programs. Financial incentives include grants for implementing health programs, bonuses for schools that achieve health and sports participation targets, and subsidies for schools that invest in health infrastructure. In summary, this article suggests innovation in health economics and physical education in schools by identifying gaps in previous studies and proposing new approaches.

Introduction

The impact of school and student health on the effectiveness of physical education programs cannot be overstated. Students in good health are more likely to participate in physical activities, maintain good mental health, and build strong social relationships. These factors, in turn, contribute significantly to their overall well-being and development (Martinović et al., 2011). Also, optimistic teachers with high organisational health deliver higher-quality physical education programs (Williams et al., 2020). In addition, schools that provide appropriate and healthy sports facilities and equipment create an enabling environment for the development of physical education programs (Barrett-Williams et al., 2017). Creating a healthy school environment and enhancing the health of students and teachers is a priority. However, it is a complex task that requires significant budget and financial resources. As some studies have shown, insufficient funding poses an essential challenge for public schools in delivering health education programs to students, particularly in low-income countries. This underscores the need for the proposed economic strategies (Akera et al., 2023; Hewitt et al., 2018). Although other studies have emphasised the role of different factors, such as the importance of school-researcher partnerships and co-production of study, skills-based education, community engagement, and incorporating innovation in promoting health and well-being (Akera et al., 2023; Hewitt et al., 2018; Kuzmina et al., 2019), the importance of financial provision for improving school health and hygiene cannot be overlooked.

Previous studies showed that effective health economics policies in schools require integrating health impacts into economic evaluations, prioritising equity, building capacity in health economics, and adopting holistic well-being approaches that recognise the interdependence of health, education, and financial outcomes (Chopra et al., 2023; Ezenduka & Onwujekwe, 2022; Hensher, 2023; Lee et al., 2020; Santos, 2022). Health economics policies can promote physical activity and overall well-being in school settings by incorporating physical activity benefits into economic evaluations, investing in infrastructure, incentivising active transportation, prioritising equity, and fostering cross-sector collaboration (Hensher, 2023; Lee et al., 2020; Santos, 2022).

There is a perspective that a healthy environment can enhance teacher-student interactions and improve physical education in schools. Therefore, it is essential to identify and implement healthy economic policies to achieve this goal and ensure a healthy school environment. A healthy school environment is crucial for improving teacher-student interactions and enhancing physical education, which can be achieved through the implementation of effective economic policies. Such policies should focus on creating a holistic and supportive environment that integrates health and education. For example, the Whole School, Whole Community, Whole Child (WSCC) model emphasizes the interconnectedness of various elements, such as health education, physical activity, and community participation, that are necessary to promote a healthy school environment (Solomon et al., 2018). This issue is particularly significant in developing countries facing financial crises. While past research has documented the health benefits of physical education (PE), some studies have touched on broader economic health policies in schools. Still, studies on the effect of health economics strategies on physical education are limited (Nath et al., 2024; Ramires et al., 2023). Study gaps need to be addressed in the literature, and the present study seeks to address this by identifying healthy economic strategies for developing physical education in schools. When implemented, these strategies and policies can significantly improve the health and well-being of students and teachers, creating a more hopeful future for school physical education programs.

Integrating Health Impacts into Economic Evaluations

The return on investment is typically the primary consideration for investment in a particular area. Given that physical education in schools leads to health improvements, policymakers in the health sector will recognise that the economic benefits of investing in school health result in health development. This can be evident in reducing healthcare costs and encouraging them to invest. As educators and policymakers, your role is crucial in convincing and persuading economic health policymakers that the health impacts of physical education should be regarded as the return on investment in school health. Your advocacy is not just a suggestion but a powerful tool that can encourage policymakers to invest in school health development. This step can be achieved through holding meetings and various conferences. Your influence can make a significant difference in the future of school physical education.

Developing Student Insurance as A Safety Valve

Developing student insurance as a safety valve can play a significant role in developing physical education in schools. By providing comprehensive insurance for students, the financial concerns of parents and schools regarding costs arising from sports injuries are reduced. This can encourage greater participation in physical activities and motivate parents and schools to provide more support for physical education programs. Student insurance can be enhanced by increasing insurance coverage, raising awareness and educating parents and schools, collaborating with insurance companies to offer affordable plans, and providing discounts and incentives. Government support through legislation, allocation of necessary funds, and improving insurance services can also play a crucial role. For instance, the government can mandate schools to provide student insurance, allocate funds for subsidising insurance premiums, and work with insurance companies to develop affordable plans for students.

Distributive Justice in Health Services

Equitable distribution of health services and facilities in schools across different regions of a country, a concept known as "distributive justice in health services," can facilitate access to healthcare services for various societal strata with other social and economic back-

grounds. The development of healthcare in schools can significantly enhance physical education. For instance, by providing appropriate health infrastructure and facilities, students can easily participate in physical activities and benefit from physical and mental advantages. Additionally, offering counselling services in nutrition, mental health, and hygiene principles to students and parents raises awareness about the importance of sports and health, encouraging greater participation in physical activities. Moreover, leveraging healthcare resources to support physical education programs enables schools to significantly improve the quality and content of their sports programs, leading to more significant positive impacts on the health and education of their students. Achieving these goals requires the presence of distributive justice in healthcare services to ensure that all students benefit from the significant health advantages that contribute to the development of physical education.

Investment in School Health Infrastructure

Investment in school health infrastructure includes improving facilities such as toilets and sports halls, providing quality drinking water, and ensuring personal and public hygiene amenities at schools. These measures directly enhance physical education in schools, as students with access to adequate sanitation facilities can participate in sports without concerns about health risks. To strengthen school health infrastructure, methods such as increasing budgets for renovation and construction of health facilities, leveraging modern health technologies, empowering teachers and students in health education, and establishing effective management mechanisms for health supervision and monitoring can be utilised.

Encouraging Health Policies Related to Transportation

Encouraging health policies related to transportation involves initiatives that promote active transportation, such as walking and cycling, and reduce reliance on private vehicles like cars and motorcycles. These policies can increase physical activity among students during their commute to school. For example, providing safety measures and favourable conditions for walking and cycling, establishing dedicated bike lanes, and promoting public transportation near schools can encourage students to adopt safer and more active modes of transportation. Strategies such as conducting studies

to assess needs and existing challenges, designing and implementing educational programs for public awareness, and implementing structural and legislative changes to incentivise active transportation can be employed to develop these policies.

Empowering Teachers and School Administrators in Health Economics

Empowering teachers and school administrators in health economics involves educating and enhancing their knowledge regarding the connection between physical education, health, and economics. Optimal financial management in school health can contribute to developing sports infrastructure. Moreover, this awareness influences the reflection of school staff with parents and students, fostering better planning for sports participation in schools. With a sufficient understanding of health economics, school managers and teachers can improve efforts in attracting investments, financial management, and enhancing the health of school environments and students. Empowerment strategies may include regular training courses and fostering supportive organisational cultures. Additionally, national medical organizations should prioritise policies for empowering schools' human resources through coordinated training and support programs.

Offering Financial Incentives to Schools

Offering financial incentives to schools that have shown significant improvement in school health can be a powerful tool to encourage continuous enhancement of health services towards advancing physical education in schools. These incentives may include direct financial grants, allocating additional funds for upgrading health infrastructure, or providing rewards to the teachers and administrators actively contributing to improving school health. Such initiatives aid in achieving students' health and physical education goals and motivate schools to strive for ongoing improvements in this area. To ensure the success of this policy, clear criteria for evaluating performance and progress in physical education programs through school health development should be established, followed by the implementation of financial incentives based on these criteria to en-

courage motivated schools to deliver better and enhanced services in this field.

Fostering Cross-Sector Collaboration

Strengthening intersectoral collaboration through promoting partnerships and joint agreements between the education department, health departments, medical universities, health service-providing organisations, and sports organisations can consolidate resources and expertise, leading to significantly enhanced health development in schools. This collaboration enables better decision-making and planning, providing a safer and more suitable environment for students and teachers to engage in physical activities. Such partnerships allow for the optimal use of available financial and human resources and facilitate the exchange of knowledge and experiences between different sectors. For instance, medical universities and health centres can prepare and provide health and physical education programs to schools. At the same time, relevant organisations and local governments can supply additional funding and necessary infrastructure. These collaborations create a broad support network, resulting in improved quality and efficiency of physical education programs in schools through the development of health and hygiene initiatives.

Conclusion

This article aimed to identify economic health strategies for schools to develop and promote physical education in schools. The pursuit of this goal was motivated by the fact that most studies in the literature have focused on the role of physical education in health, identifying numerous physiological, psychological, social, and even economic factors as the effects of physical education. On the other hand, studies have emphasised the role of health in creating a safe exercise environment. However, studies on economic strategies for health development, especially in the educational and school environment, are limited. It is a consensus among most economists and education policymakers that developing school health requires attention to countries' economic and social conditions. Therefore, planning and identifying appropriate strategies in this area is essential.

Table 1
Eight Health Economic Strategies for Boosting Physical Education in Schools

Row	Strategy Name	Explanation	Suggestions
1	Integrating Health Impacts into Economic Evaluations	Incentive for investment	Holding meetings and emphasizing reduced healthcare costs
2	Developing student insurance as a safety valve	Increasing student peace of mind	Increasing insurance coverage and collaborating with insurance companies
3	Distributive Justice in Health Services	Fair distribution of health services	Fair distribution of services and counseling services
4	Investment in school health infrastructure	Access to health infrastructure	Increasing budget, using modern technologies, and training
5	Encouraging health policies related to transportation	Encouraging active transportation	Creating safety conditions and designing educational programs
6	Empowering teachers and school administrators in health economics	Increasing awareness and knowledge	Regular training courses and creating supportive organizational cultures
7	Offering Financial Incentives to Schools	Providing financial aid	Direct financial aid and setting evaluation criteria
8	Fostering Cross-Sector Collaboration	Facilitating financial resources	Promoting cooperation between the Ministry of Education, the Ministry of Health, and sports organizations

When discussing health economics, we address the intersection of medicine and economics. Policymaking in this area requires precise and proper planning. When we seek to observe the impact of health economics policies on physical education in schools, the third dimension, sports, is transferred to economics and health. This article presents eight suitable strategies to achieve this goal. The first strategy showed that the health benefits resulting from physical education could be a great incentive for investors in school health economics; therefore, health effects should be integrated into economic assessments. The second strategy suggests that developing student insurance as a safety valve can provide greater peace of mind for students and their families to participate in school sports.

The third strategy indicated that local governments' equitable distribution of health services in different regions should be considered for developing physical education in schools. The fourth strategy showed that access to more health facilities and infrastructure in schools leads to the development of physical education. The fifth strategy demonstrated that health-related transportation policies,

such as cycling from home to school, can play a role in developing physical education and health activities. The sixth strategy emphasised empowering school staff to increase their health economics awareness and knowledge.

The seventh strategy indicated that providing financial incentives to schools that have been outstanding in health development can be an effective solution. Finally, the eighth strategy showed that intersectoral cooperation between the Ministry of Education and health and sports organisations could facilitate the provision of financial resources and the development of health economics in schools.

Several practical suggestions have been put forward to achieve the proposed strategies for developing physical education in schools. The first strategy is integrating health impacts into economic assessments. This can be achieved by holding multiple meetings and conferences with economic policymakers to demonstrate the financial benefits of physical education in schools. Additionally, emphasising the reduction in healthcare costs as a return on investment in school health is crucial. The second strategy involves developing student insurance, which includes increasing insurance coverage and educating parents and schools about the benefits of student insurance. In this regard, collaboration with insurance companies to offer affordable plans and provide discounts and incentives is essential, along with government support through legislation, budget allocation, and improving insurance services.

The third strategy is ensuring the equitable distribution of health services, which involves the fair distribution of health services and infrastructure in schools across different regions of the country, providing counselling services in nutrition, mental health, and health principles to students and parents, and utilising health resources to support physical education programs. The fourth strategy involves investing in school health infrastructure, which includes increasing the budget for renovating and constructing health infrastructure, using modern health technologies, training and empowering teachers and students in health matters, and establishing effective management mechanisms for monitoring and tracking health.

The fifth strategy encourages policies related to transportation, which can be realised by creating safe conditions and measures for walking and cycling, designing and implementing educational pro-

grams for public awareness, and making structural and legal changes to encourage active transportation. The sixth strategy empowers teachers and school administrators in health economics through regular training courses, creates supportive organisational cultures, and prioritises human resource empowerment policies by national medical organisations.

The seventh strategy involves providing financial incentives to schools, which can be effective by granting direct financial aid and allocating additional budgets for improving health infrastructure, setting clear criteria for performance evaluation and improvement of physical education programs, and awarding teachers and administrators who play an active role in improving school health. Finally, the eighth strategy is developing inter-sectoral collaborations, which can be achieved by promoting cooperation and joint agreements between the Ministry of Education, the Ministry of Health, medical universities, health service providers, and sports organisations, making optimal use of existing financial and human resources, and exchanging knowledge and experiences between different sectors. These suggestions can help realise the proposed strategies and develop school physical education.

In conclusion, implementing these eight strategies can lead to the development of school health economics, providing the foundation for the sustainable enhancement of physical education in schools. This, in turn, will improve student health and contribute to the economic and social betterment of communities.

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SPORT EDUCATION

Youth Athletes With Dyslexia and Their Experience Within Inclusive Sport: What is the Influence of the Coach?

Marko Pavlovic, Laura Casey, Kelly Simonton

Abstract

This study examined the relationships between emotions, perceptions of coaches, motivational/emotional climates (emotional relationships and environment within a specific context), and personal/social growth (development of personal growth and social interactions through and within sporting experiences) from the viewpoint of youth athletes with dyslexia. A qualitative one-on-one interview approach, focusing on youth athletes with dyslexia (N=12) was used to explore these athletes' experiences when in sport. Qualitative analysis resulted in three major themes: (a) Hidden disabilities tend to stay hidden, (b) Caring is coaching, and (c) Social and emotional experiences matter. Findings showed that sporting experiences can have an impact on these athletes social, physical, and psychological growth. This study's findings also exposed that the psychological, emotional, and motivational aspects of youth-athletes' with dyslexia development can be encouraged

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through the motivational climate created by the coaches. The interrelationship between skill ability, understanding performance, and emotional experiences for all youth athletes matters, but even more so for those who have hidden disabilities. The limitations and future research suggestions are embedded within the text.

Introduction

When considering youth sport activities, it is first important to note that the prevalence of those who qualify for services under the Individuals with Disabilities Education Act (IDEA) is estimated to be 15% of students in public school populations, or an estimated 7.5 million students who nationally require services (U.S. Department of Education, 2023). As a result, the likelihood of having students in a classroom or on a youth sports team who experience some form of disability is quite high. In addition, many organizations, teachers, and researchers have supported the push for a fully inclusive learning environment where all youth—with disabilities or without—are given opportunities for the same educational and/or sporting experiences (Vargas, 2019). For example, youth athletes with a range of physical/mental exceptionalities are participating inclusively in sport and physical education (PE) experiences alongside peers without exceptionalities. While this initiative is a positive one, many youth athletes participating inclusively may require unique and individual attention to assist in their success (Spaaij et al., 2014). Specifically, for this research, dyslexia is targeted as it estimated to account for over two million of the seven million requiring services and is often identified as a hidden disability where coaches an instructors may not be aware of the youth's disability.

In this case, a "one-size-fits-all" approach (Tomlinson et al., 2003) for coaching and personal/social/emotional development of these youth athletes is not ideal. This is primarily due to the evidence that students in differentiated learning environments (i.e., supporting individual needs) achieve better outcomes than those with a more uniform approach to instruction in learning, social interactions with peers, and general attitudes toward school, for example (Schuelka & Lapham, 2019). And, given that most youth sporting experiences are

fully inclusive, it is practically a prerequisite in the 21st century for coaches and instructors to be trained to meet students with varying needs and disabilities. Thus, specified instructional practices for teachers/coaches are needed to assist these students in reaching not only their physical potential, but also the critically important personal, emotional, and social development.

Sport and PE experiences can help youth develop important lifelong attributes such as confidence and positive attitudes toward being active and social when a positive and enjoyable experience is provided (Gaspar et al., 2021). Fostering positive youth experiences and promoting greater involvement and motivation for activities, such as sports, is commonly a result of the motivational climate (Sierra-Díaz et al., 2019). The motivational climate can foster a focus on individual improvement and effort to reach success or it can promote environments that prioritize comparison and winning, which may lead to more maladaptive experiences (Harwood et al., 2015).

These realities of sport may be particularly important to understand for youth athletes, who are still developing and participating for social reasons. Social and contextual factors that define the motivational climate are established by the different catalysts such as peers, family, or teachers/coaches (Cervelló et al., 2004). Furthermore, while motivational climates can vary, they typically have significant influence on the perceived success and/or failure for the young athlete (Ommundsen et al., 2005). In light of these findings, there is reason to believe that understanding the motivational climate is a necessary tool for all coaches, particularly coaches who work with students who have unique needs and mental, emotional, and intellectual disabilities.

Youth Athletes and Hidden Disabilities

Although there is a plethora of research that examines instructional strategies for several learning disabilities (Kohli et al., 2018; Sherrill & Pyfer, 1985; Wong et al., 2003), there continues to be a need for research and training as it relates to those with disabilities participating in physical dominant environments like youth sport. Youth sporting environments are highly related to the youth PE inclusive experiences, and it is likely that strategies and considerations for coaches can be learned from training techniques offered to PE

teachers (and to adapted PE/physical activity specialists; Bertills et al., 2019). In particular, hidden disabilities are often considered learning and intellectual differences that coaches and teachers can not overtly see, and thus may not even realize they are present and need consideration (Vargas et al., 2019; 2015). Without consideration, it is likely that coaches cannot help these youth athletes improve and cannot promote positive personal social growth.

One of the hidden disabilities that is not easily observed, yet highly prevalent, includes dyslexia. There is a strong need for understanding athletes and students in this area as dyslexia affects about 30% of the population in the United States (National Center for Educational Statistics, 2021), and it comprises the majority of all learning disability conditions (Cortiella et al., 2014). Existing literature is limited when investigating everyday learning experiences of students with dyslexia, although it is the most common learning disability, and usually involves improving educational understanding and performance. Previous research shows that students with dyslexia experience difficulties with social stigma and access to reasonable adjustments (MacCullagh et al., 2016; Stoeber & Rountree, 2020). In other words, dyslexia is much more common than other hidden learning disabilities, and it is extremely likely that coaches will be working with students who are dyslexic multiple times in their careers. Dyslexia is an understudied area of need for youth development, and it can impact youth athletes' physical and mental/social development in sport (Vargas et al., 2019). If coaches are unaware of these special needs and they implement a highly direct and ego-performance climate, it is likely that these athletes may experience sport burnout, limited physical development, and ultimately experience negative personal and social connections to the sport/team.

The importance and influence of peer relationships and positive personal development for student-athletes with dyslexia cannot be overstated because they tend to develop lower levels of self-esteem and have negative emotions/experiences when it comes to social relations (Terras et al., 2009), self-perception (Burden, 2008), and peer and family relationships (Ghisi et al., 2016). Unambiguously, students with dyslexia experience problems with having the ability to adapt to different situations, behaviors, and personalities which may result in low self-confidence. In other words, youth sport and

all of its benefits can help youth grow and advance, and potentially, could also be a great opportunity for students with disabilities to reap the same benefits as the general student population. Therefore, it appears that building stronger and inclusive climates as suggested by Beyer and colleagues (2009), will create environments which will not only reduce problem behaviors, but would also offer more choices and opportunities for success and challenge, instead of competition as the main source of fulfillment.

The influence of a coach can play an important role in the life of athletes with dyslexia, particularly as it relates to offering specified multi-dimensional instruction, meeting individual needs, and in prioritizing the person as well as the athlete. This experience involves the role of a coach and their relationship with a student athlete with dyslexia. The coach's impact appears to be a significant one and needs to be taken into consideration. A compelling question arises to coaching practices when instructing those with dyslexia, as to the degree those practices are motivating and supporting, and does the coach-created climate influence personal/social development of student athletes with dyslexia? Therefore, it is important to explore athletes with dyslexia and their experience within the inclusive sport as they may require unique and important strategies to thrive. The motivational climate seems to align with many inclusive and individually driven strategies that likely support those with hidden disabilities like dyslexia.

Motivational Climates for Youth Athletes

To address the potential concerns of supporting youth athletes with mental, emotional, and intellectual disabilities, the motivational climate seems to be an important area of consideration given its connection to helping athletes achieve a positive and enjoyable sporting experience. Often, climates are described by major categories, including the task-mastery and ego-performance involved environments (Ames, 1992). The motivational climate is grounded in the Achievement Goal Theory (AGT; Ames, 1992) as the learning environment is determined to inform and dictate the individual goal orientations. Within AGT, participant motivation is determined by their goal orientation characteristics. Goal orientations typically include a mastery orientation of persistence, effort, and individual self-improvement and/or the performance orientation, which is centered

on outperforming and comparing to others which maladaptive persistence and motivation in many cases (Harwood et al., 2015; Into et al., 2019; Ommundsen et al., 2005). Accordingly, perceived motivational climate (dictated by the instructor/coach) and achievement goals (embedded within the perception of the participant/athlete) are significant paradigms used to interpret individual experiences.

The task-mastery climate typically includes an environment in which athletes have autonomy to make choices, progress and develop at their own pace, and develop strengths. At the same time, an ego-performance climate typically includes a teacher or coach regulating a great deal of the environment rewarding more athletically skilled students, fostering social and personal competition/comparison between peers, and providing public judgement. As an alternative, a task-mastery-involved learning environment is comprised of the teacher urging and supporting independence, individual problem solving, and mastery of the task progression that is self-paced, self-guided, and involved (Cervelló & Santos Rosa, 2001; Nicholls, 1989; Roberts, 2001). The task-mastery climate approach is meaningful because it provides coaches the opportunity to support youth athletes at the individual level, at their own pace, while developing an overall inclusive environment for all participants, as opposed to being comparative (Harwood et al., 2015; Into et al., 2019; Ommundsen et al., 2005). Research on the motivational climate in youth sport provides evidence to this point, suggesting that youth will have a more holistic and meaningful experience if they are afforded more task-mastery- involved climates created by teachers and peers (Ames, 1992; Cervelló & Santos Rosa 2001; Nicholls, 1989; Roberts, 2001).

Previous research on the relationship between the perceived motivational climate, achievement goals, and peer relationships in young soccer players demonstrated a systematic relationship with peer acceptance and friendship (Ommundsen et al., 2005). Furthermore, existing literature rationalizes how enjoyment is believed to be one of the most significant motivational elements in youth sports because it has been positively associated with adaptive motivation and continued involvement (Fraser-Thomas et al., 2008; Wall & Cote, 2008) and inversely with dropout and burnout (Strachan et al., 2009). Emotional growth and considerations for personal and social development of athletes are important, but the positive impact

of sport on students with disabilities may be even more meaningful as it relates to building confidence and self-esteem. However, there is limited work overall on youth athletes with disabilities in fully inclusive sports and the impact these experiences can have on their personal, social, emotional, and physical development. In addition, the "hidden" nature of many mental, emotional, and intellectual disabilities of students in inclusive sporting environments may be overlooked by coaches and the climates they create, which may have maladaptive effects. Consequently, this research underlined the need for humanistic approaches to coaching, specifically when working with youth athletes with dyslexia. Therefore, exploring relationships between youth coaches and athletes with dyslexia from the athletes perspective may improve our understanding of their experiences.

Purpose

The purpose of this study was to examine the relationships between youth athletes' with dyslexia emotions, perceptions of their coaches, motivational/emotional climates (emotional relationships and environment within a specific context), and their personal/social growth (development of emotional intelligence and psychological resilience). Explicitly, these athletes were asked about their perceptions of their coaches, climates, and their personal/social development. They were also asked about their emotional experiences when in sport and the coaching behaviors they perceived to accommodate (or failed to do so) their disability and their personal development. This investigation included athletes in fully inclusive sport teams. The following research questions guided this study:

RQ 1. How do youth athlete's with dyslexia perceive their inclusive sporting experience?

RQ 2. What type of support do youth athletes with dyslexia receive from their coaches?

RQ 3. How do coaches support their learning disability when it comes to stimulating self- confidence, motivational/emotional climates (emotional relationships and environment within a specific context), and enjoyment?

RQ 4. What strategies did athletes perceive as the most influential coaching reinforcements for support and growth?

Methods

This research utilized a qualitative approach to explore how youth athletes perceive their inclusive sporting experience and how coaches support them when it comes to strengthening self-confidence and physical skills, as well as the motivation and physical activity enjoyment. At the same time, this study exploits epistemological approaches in an attempt to address the shortcomings of these student-athletes' ability to have accurate and reliable knowledge and awareness about their dyslexia emotions, perceptions of their coaches, motivational/emotional climates (emotional relationships and environment within a specific context), and their personal/social growth (development of emotional intelligence and psychological resilience).

Thus, this study's ontological stance, and what these athletes see as "real" within the context, helped in determining whether they view reality as objective and unique, or as constructed and multiple depending on individual viewpoints. Furthermore, it ameliorated a rigorous process of reflection and data interpretation, which supported researchers' approach, positionality, and reflexivity, which are widely acknowledged to be important considerations when planning and conducting research (Huberman & Miles, 2002; Savin-Baden & Major, 2013).

Procedures and Participants

A local elementary school that specializes in teaching students with dyslexia was purposely selected to recruit upper elementary student participants for this study. Specifically, the sample of students included those who have dyslexia who also participated in fully inclusive recreational sports outside of school. Following administration, parental, and IRB approval, the researcher conducted one-on-one interviews with the athletes who volunteered to participate via consent and assent. In particular, youth athletes with dyslexia were interviewed to share their experiences as they relate to their coaches' ability to support, accommodate, and modify for their needs. Interview questions centered around how their coach

and teammates make them feel, what things their coaches do that have the most positive and negative impact on how they feel when participating in their sport, and their perceptions of sports through their emotions, goal orientations, perceptions of social relationships, and feelings of being capable.

Participants in this study were youth student-athletes with dyslexia (N= 12; six males and six females in upper elementary school) who participate in fully inclusive youth sport outside of school. Sampling method was based on convenience and accessibility; thus, purposeful sampling was used. The average age of the participants was 12.5 years old (SD=0.52). Sport participation varied from soccer, basketball, baseball, football, and cheer. The participants reported the average number of years they participated in their sport as 2.91 years (SD= 0.90).

Data Collection and Data Analysis

Interview data was collected using one-on-one interviews with each of the 12 participants. All interviews were recorded and transcribed verbatim then analyzed using a thematic approach evaluating both the perceptions and the emotional experience of the athletes. Each of the interviews was conducted by the corresponding author of this research, and it lasted 30 minutes, adding up to 360 minutes across all 12 participants. Each interview took place in each of the participants' homeroom classroom, during which the researcher not only followed preset questions, but also included additional questions in response to participant comments and reactions. The interviewer relied upon an interview protocol, asking questions and covering topics as scheduled, but also probed discussion, and followed ideas. Both inductive and deductive analysis techniques were used. First, all data was coded line by line and given labels developed into a codebook. From there, data was read again, and codes were compared to explore common themes both within each individual and across groups. Codes that share relationships were linked using constant comparison techniques (Lincoln & Guba, 1985) and were used to create themes and subthemes to represent the key findings (Patton, 2015). Main themes were those that emerged most often from connecting subthemes and those of which that provided detailed explanation to the various patterns from the quantitative analysis and the theoretical backgrounds of the variables of interest (Creswell, 2015).

Reliability and trustworthiness of the data were demonstrated by the multiple reviews of the interview data and comparison methods used for creating the codebook, which further supports the conviction in the findings by demonstrating reliability and diligence in the analysis process. Having more than one researcher analyze the interview data, this study established trustworthiness and warranted that the interpretations are not exclusively grounded on one participant's standpoint or researchers perspective.

Findings

Qualitative analysis resulted in three major themes reported by the student athletes with dyslexia, which included: (a) hidden disabilities tend to stay hidden, (b) caring is coaching, and (c) social and emotional experiences matter. Following analysis, these three reoccurring themes were suggested to have the most impact on the athletes' involvement.

Theme 1: Hidden Disabilities Tend to Stay Hidden

While participants were reluctant to discuss their dyslexia in relation to their sporting experience, the two main subthemes that we heard from students were (a) they tried to keep their dyslexia anonymous, and (b) they really feel like they are playing catch-up all the time. To address the first subtheme, these students explained how keeping their dyslexia undisclosed was extremely important because they felt embarrassed, anxious, or they did not want to feel any different from any other athletes on the team. Hailey mentioned how she feels "embarrassed when having to explain what dyslexia is and how it feels different to have it." Therefore, Hailey chooses purposefully to hide her disability, because she does not want to stand out or, she does not want to be known in the negative context as a "special athlete." Hailey says that "It is easier to not talk about it, and to go with the flow with everyone else. If I don't do that, I feel like I am standing out, and I don't like to stand out. I don't like to be embarrassed, and I don't like to be called out in front of everyone."

Nathaniel explained that he did not want to be treated differently from others on his team and he did not want to take away everyone's time, "because we are a team, and we are all even, and there is not time to deal with more problems from players." In other words, this student felt like he was placing unnecessary burden on his team by

discussing his disability. Nathaniel mentioned also that his learning difference "should not be judged" and that he "does not like when his teammates feel sorry for him." The sense of fitting in with the others on a team tends to be critical, and these student athletes were no exception as they did not want their disability to become an issue. Also, the sense of potential embarrassment and shame was very strong and tended to overshadow their potential needs.

Subsequently, the second significant subtheme is that these students felt like they were trying to catch up all the time. They reported several instances when they did not know what was going on and they did not tell anyone about it. Their sense of being lost, late, or confused was something that all of them explained was an ongoing feeling. For example, John said that,

> when coach is explaining the basketball tactics, he uses these "big words" and he talks fast, and I don't want to tell him that I don't understand him because he will yell, and I don't like when he yells at players.

Moreover, Alex said that,

> I like when we are at our locker room, and our coach draws little x's and y's at the board, in which he explains who stands where, and who does what. Because of that, I can picture myself on the field and imagine in my head what I need to be doing out there.

In addition, Mary says that when her coach shows tactics on a coaching board, "She sounds like she speaks gibberish, and I really don't understand her and just kind of follow everyone else."

This previous subtheme and these quotes have multiple connotations. The first is that the athletes reported that conveying their needs would make their coach mad, suggesting the negative potential social outcomes possible as a result of their disability needs. Secondly, they reported that visual spatial learning might be preferred learning style, because they learn better when their individual needs are recognized, or when they can create a more vibrant and clearer picture of knowledge through visual imagery. Lastly, they reported that this situation was uncomfortable for these particular athletes, thus they tried to avoid conflict with their coaches (avoid yelling) and

make self-improvisations that likely limit their performance growth. Furthermore, Kira said that "I don't want to tell anyone that I am confused, because half of the time I don't understand what is going on, and I just follow what everyone else is doing on a team and get by." She does not want to stand out for "my friends to think that I am stupid and that we will lose our game because of me." In other words, these athletes reported that it was important for them that their disability stays hidden due to feelings of shame, embarrassment, or simply because they did not want to be labeled as different or to stand out in a negative way. Implications of such attitudes for student athletes with dyslexia can potentially be psychologically and socially harmful.

Theme 2: Caring is Coaching

Another reported theme was that of the team/coach relationship. In all of the reports, regardless of the type of sport, it was evident that the coaches' character and behavior can impact athletes' perceptions of personal and social development. These students emphasized the importance of a positive coaching climate and enjoyable feelings when they participate and play. Phoebe noted that her coach is "so supportive and welcoming, and because he is nice to all the girls, we all want to play for him, and we all want to win." She further explains how,

> he never gives up on us, he always encourages us and speaks calmly, and we just love his calm voice. When he talks, he looks at me and he is direct, and it is easy for me to understand him.

This participant also mentioned that their coach understood the impact of dyslexia because his daughter was also diagnosed with it, and so he knew how to instruct and guide in a positive way. Compartmentalizing instruction, guiding prompts, and using simple language and terminology, generated an encouraging coaching climate that produced positive feelings and a sense of belonging to this particular athlete. On the other hand, Eli described how his baseball coach was almost always angry and did not show patience during misunderstandings, which is why "his players are scared of him, especially when he gets super competitive, which then makes

us very nervous." A negative coaching climate in this instance creates a sense of frustration and anxiety, and like this athlete explained, "half of the team is looking for other teams to play ball." When asked if their coach knew about this student's learning disability, the student explained that he just "does not want to tell him because he will not understand." Unenthusiastic relationships and lack of knowledge and understanding led to a negative coaching climate that was usually followed by bad experiences for all participants.

Theme 3: Social and Emotional Experiences Matter

The third theme was the importance of social and emotional experiences as they interpret the sporting experience. In this case, positive emotional experiences in practices and games proved to be the biggest predictor of social connection. For example, Avery said,

> I love soccer and to play on a same team with my friends, and I love when we score a goal and then celebrate. We came up with our own goal celebration when we all dance kind of funny and we just laugh. That is my most favorite thing ever!

Therefore, being active in sport and playing on a same team with friends was enjoyable due to special moments of celebration that she drew upon to explain her motivation for remaining involved. This is another powerful example that shows how these students report identical reasons for wanting to be involved in youth sport as their non-dyslexic counterparts.

The same could be said about negative emotional experiences. For instance, Alice stated that her best friends family "had to move out of town, and my friend is not there anymore, and I do not feel like playing for the same team, because I don't have friends there anymore." Moreover, Bob reported that "baseball is boring, and my dad is making me play, and I just don't like standing there doing nothing," while Beth explained how her "coach sometimes yells at us if we don't stay in our offensive shape [formation] on the field." All of these reports are examples of negative social emotional experiences that can be detrimental, and these athletes recognize whether or not they want to stay active and play. In other words, Bob wanted to play, but negative coaching (coach making practices monotonous), led to boredom and a lack of motivation or desire to play. Beth's negative

experience comes from high coaching demands, which led to her not performing like the others. Dyslexia is frequently described as a language-based learning disability that comes with discrepancy in spelling, word recognition, and decoding skills (Adlof & Hogan, 2018). Due to Beth's dyslexia and her inability to process coded information, this interrupts "normality," uncovering otherwise hidden experience, imposing the difficult task of her adjusting to the coaches tactics. Research shows that dyslexia and low self-concept are interconnected (Riddick, 2009), so students with dyslexia are at a higher risk for lower academic success and general self-concept (McArthur et al., 2016). These theoretical and clinical findings encourage careful consideration when working with students with dyslexia in cognitive development settings.

Discussion

The purpose of this study was to systematically explore aspects of the environmental, personal, and emotional experiences of youth athletes with dyslexia to uncover and identify coaching techniques that impact the athletes climate. The study used a qualitative methodology with purposeful sampling across 12 student athletes with dyslexia to unlock common themes across several domains regarding inclusive sporting environments. In addition, this research highlights nuanced implications of coaching those with dyslexia and consequently its impact on positive personal and social development in the sport. Caring for athletes, rather than caring about athletes and taking time to interact and using conversation to develop a relationship (Jones 2009), would be of tremendous importance, especially for student athletes with dyslexia.

The first outcome found in this research was that hidden disabilities tend to stay hidden. For various reasons, student athletes with dyslexia tend to keep their disability private. These athletes choose not to be open about their struggles and do not come forward with their difficulties and setbacks. They reported being likely to try to suppress their dyslexia characteristics because they feel embarrassed, anxious, or they did not want to feel any different from any other athletes on the team. In other words, reports suggest that student athletes do not want to stand out and be known in the negative context as a "special athlete." These are examples of negative social-emotional experiences in children with dyslexia as a result of

connections between low self-esteem and social relations (and vice versa) (Shehu et al., 2015).

Similarly, there is a significant connection between reading/writing/language disability, interpersonal relationships, and socio-emotional disability (Habib & Naz, 2015). Ultimately, the athletes' feelings of insecurity may be due to dyslexia and poor social skills that hinder the development of close friendships. Therefore, it is recommended that coaches develop and enhance knowledge, attentiveness, and awareness about dyslexia among young athletes, which might be the first steps in making adjustments that are subtle to where the teammates would not notice. Perhaps being aware and understanding what dyslexia is, and how it affects youth athletes, will allow coaches to diversify their coaching. By doing so, they can best meet the needs of athletes with dyslexia while also meeting the needs of others.

In addition, previous literature unveils that nearly 90% of individuals with dyslexia describe their thinking as looking beyond information to achieve a strategic (big-picture) perspective of the subject/problem (Casanova et al., 2009). For that reason, coaches who work with athletes with dyslexia should know that they have unique neurological pathways that make it easier for them to understand big-picture ideas and skills. This means that it is likely they will progress on details more slowly. Coaches need to weigh which details are actually needed or take smaller steps to the larger picture by breaking the big picture down.

The second major outcome of this research is that caring is coaching. This study showed that it also important not to force student athletes with dyslexia to move on if they have not mastered some of the refinements of a skill or task, as this may cause overload for these athletes. Clearly, this can have a major impact on performing tasks, accomplishing goals, or completing obligations as externally determined by the coach's goals. However, even for neurotypical athletes, it is often not wise to force them to move beyond a skill set until they are fluent in the present skill. Consequently, preparation, pre-planning, understanding, and organization are cornerstones of supporting the needs of student athletes with dyslexia in an inclusive setting. These athletes prefer a positive, supporting, and welcoming coach, one who speaks directly and is easy to understand. This

includes simple and clear terminology without unnecessary details or jargon that tend to be overwhelming. Shortening instruction and scaffolding will produce the positive coaching climate desired, which furthermore will develop positive feelings and a sense of belonging for student athletes with dyslexia. This means that although the coach still provides information and direct instruction, it is the athlete's rate of understanding and skill mastery that dictate the speed of progression. Once progression to more advanced skills comes into play, revisiting earlier skills is key to ensuring that the athlete has maintained the prerequisites. Learner-centered or player-centered approaches like this improve skill development, game-playing ability, motivation, and provide positive affective experiences of learning (Kirk, 2005; Pope, 2005). In addition, it is essential to understand that modifications will be needed to meet some players where they are to get them where they need to be. In other words, caring for athletes as individual learners and taking the time to know them and interact with them, would be of tremendous positive importance for student athletes with dyslexia.

The third outcome of this research relates to positive social-emotional experiences. For instance, emotional experiences in practices and games proved to be the biggest predictor of positive personal-social experience for athletes with dyslexia. The athletes enjoyed being active in sports and playing on a team with their friends. This experience develops elevated levels of self-esteem and healthy social relations, great motivation, and willingness to play. On another hand, negative social-emotional experiences tend to develop negative relationships and emotional states of mind for athletes with dyslexia. Such negative environments only increase their frustration, and feelings of being overwhelmed often links to students' perceptions of being "less than." Therefore, emotional aspects of uncertainty and overload resulting from dyslexia are extremely important. Coaches and coaching training needs to take into account the fact that athletes with dyslexia could potentially be very sensitive. Hence, in the current study, results showed that positive coaching and peer relationships (i.e., friendships) can assist in raising confidence in the students with dyslexia. Other considerations for boosting social-emotional experiences include celebrating small wins, progressions, and concentrating more on positive social interactions than on cor-

recting menial task errors. Such approaches will undoubtedly enhance the development of self-esteem and lead to positive learning outcomes.

Limitations and Future Studies

There are several limitations of this study. For instance, participants were predominantly Caucasian students from a small, private, independent school and were purposefully selected based on characteristics needed to answer the research questions. Sample size was small, and further exploration requires diverse participant groups (experience, demographics, size, etc.) to further align findings.This study only focused on these dyslexic students participating in sport in one region of the U.S., thus generalizability of their experiences is limited. Further investigation is needed regarding differing age groups and competition levels as well. Furthermore, there are significant gaps in the literature that present the need for further development in the area of study. At the same time, there is a great deal of information gathered from this study that paves the way for more coaches to view sport as an inclusive setting and as opportunity to include some experiences of student athletes with dyslexia into practices. The research can also better inform teacher education programs and other physical activity community programs about the potential impact of the motivational climate and the importance of cultivating a positive emotional experience for student athletes with dyslexia, other hidden disabilities, and the general population. The influence of a coach or a teacher can play an important role in the lives of athletes with dyslexia, especially as it relates to offering specified multidimensional instruction, meeting individual needs, and in prioritizing the person as well as the athlete.

Conclusion

This research suggests that sporting experiences can have tremendous impact on student athletes with dyslexia social, physical, and psychological growth. This research also suggests perceived shame and burdens that students reported feeling as a finding of their dyslexia in their sport. At the same time, this research recognizes that the psychological, emotional, and motivational aspects of dyslexic youth athletes' development can be encouraged through the motivational climate created by coaches. Furthermore, this study

acknowledge that dyslexic youth athletes' emotional experiences are influenced by coaching behaviors (accommodating or otherwise), and their personal development. This included exploring aspects of the environmental, personal, and emotional experiences of youth athletes with dyslexia in hopes of identifying help for coaches who work with these students to integrate psychological skills (leadership, positive aspirations, goal setting, self-awareness, visualization, etc.) into their coaching practice. This research also unveiled that the participant student athletes with dyslexia, generally speaking, did not understand what was going on, and that they would rather not speak up and look incompetent in front of their friends and coaches, instead of asking for help or clarification. Lastly, this study distinguishes the importance of utilizing a humanistic approach to coaching in addition to developing task-mastery climate as an intentional way to influence non-sport-related youth outcomes.

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METHODOLOGY

Perceptions of Physical Education Teachers Toward Warm-Up Activities

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Abstract

This study investigates physical education teachers' perceptions of warm-up activities, focusing on their significance, selection, preparation, implementation times, and perceived student benefits. The study involved physical education teachers from public schools using quantitative and qualitative research approaches. One hundred three volunteer physical education teachers participated, 47 females and 56 males. In the quantitative aspect, descriptive statistics were utilized, while the qualitative part was analyzed using a content analysis approach, focusing on participants' responses to open-ended questions. Results reveal that most participants spend 1-20 minutes planning warm-up activities, allocating 6 minutes or more during a lesson. Teachers commonly prefer activities involving the entire class due to ease of implementation and management, often allowing students to choose warm-up activities to foster creativity, increase class activity, and enhance student interest. The findings underscore physical education teachers' importance

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to warm-up activities, indicating sufficient time allocated for planning and implementation. Additionally, teachers believe warm-up activities contribute to effective lesson engagement and student participation. Recommendations include incorporating new exercises, integrating technology, offering regular training seminars, organizing student-led sessions, and exploring music's role in warm-up activities. innovative teaching tool. Further research should focus on the long-term impact of MyFitnessPal usage on health outcomes.

Introduction

Physical education stands out among other subjects by allowing students to move, learn sports concepts, and engage in activities (Bieniek & Deutsch, 2020). It plays a crucial role in the holistic development of students by encouraging healthy lifestyles, socialization, team spirit, and sports participation while fostering cognitive, psychomotor, and affective growth (Ferraz et al., 2020). These multifaceted benefits are based on the motor activities underlying the course. Motor activities are a key feature of physical education classes, leading to changes in the bodies neuromuscular, cardiovascular, and respiratory systems (Akbar et al., 2022). All students need to warm up before engaging in motor activities to prevent injuries and enhance performance (Merino-Marban et al., 2021; Räisänen et al., 2022; Fernandez-Agullo & Merino-Marban, 2022).

A warm-up is performed before exercise to prepare the body for physical activity (Brukner, 2012). Although allocating time for warming up in physical education classes is critical for preparing students for physical activity and increasing participation, research shows that many physical education teachers often neglect this essential component (Ünlü et al., 2023). In addition, warm-up is a crucial component of physical education, aiding in readying the body for activity and minimizing injury risks. It serves as the initial phase of a physical education session, with warm-up exercises potentially influencing the overall lesson's atmosphere (Barney & Leavitt, 2019). A warm-up aims to mentally and physically prepare the body for exercise (Nevia et al., 2014). An adequately structured warm-up can enhance blood circulation to active muscles, increase body temperature, optimize metabolic responses, and increase joint flexibility (Gil et al., 2019; Kapnia et al., 2023).

There are various effective ways to warm up before engaging in physical activity. Dynamic stretching involves moving muscles through movements to increase blood flow and enhance flexibility (Opplert & Babault, 2018). Another practical approach is a mix of aerobic exercise and static stretching. Aerobic activities like running or jumping can elevate heart rate and blood flow, while static stretching can boost flexibility and reduce muscle tension (Barney & Leavitt, 2019). Silva-Capella et al. (2021) found that two different warm-up types (repetitive exercises and an open, playful approach with quick decision-making stimuli) did not significantly influence physical education students' attention and focus. Incorporating core conditioning exercises and small games into warm-ups is also beneficial (Samodra et al., 2022).

Some studies indicate that school-age children show improved motor skills with warm-up routines (Gómez-Álvarez et al., 2021; Ruiz Garrigós et al., 2020). Additionally, a study suggested that integrating core-conditioning exercises into physical education warm-ups could enhance children's trunk muscle endurance, mobility, and balance. Warm-up routines should be implemented before initiating main activities in physical education classes. Traditionally, several minutes of light-intensity active range-of-motion exercises involving the upper and lower extremities, followed by static stretching, are recommended for young participants (Chang et al., 2020). Gómez-Álvarez et al. (2021) explored the immediate impact of various warm-up types on motor skills, highlighting that warm-ups involving adapted games had a more significant effect. Consequently, utilizing small games as warm-up alternatives could be more enjoyable and engaging for students.

Studies on warm-up activities for school-age students primarily concentrate on the ideal duration, methods, and specific performance outcomes (Ferraz et al., 2020; Merino-Marban et al., 2021; Obetko et al., 2020). Additionally, warm-up activities can have benefits beyond physical performance, such as creating a positive learning environment in physical education classes (Deutsch et al., 2022; Ünlü et al., 2023). Also, Barney and Leavitt (2019) state that using music during warm-up activities can create a positive classroom environment, increasing students' participation.

Warm-up activities in physical education classes seem to play an essential role in preparing the body for physical activity and facilitating the transition to the central part of the lesson (Chang et al., 2020), developing motor skills and improving performance (Pajonková et al., 2024) and preventing injuries (Merino-Marban et al., 2021). These activities can affect students' focus, engagement, and physical readiness. However, there are not enough studies in the literature on physical education teachers' perceptions of warm-up activities, their incorporation into lesson processes, and their planning by teachers. This deficiency makes it difficult to understand physical education teachers' decisions in planning and implementing warm-up activities and how they affect students' experiences in these classes. Physical education teachers' approaches to warm-up activities are thought to be critical to students' motivation and the overall efficiency of the lessons. This study aims to contribute to the existing literature by examining physical education teachers' understanding of warm-up activities and their views on the importance of these activities.

Method

Research Design

This study employed a mixed method to assess physical education teachers' views on warm-up activities. Mixed-methods research is standard in health, social, and behavioral sciences, where the researcher merges quantitative and qualitative data sets to comprehend the research issue and derive conclusions by leveraging the benefits of combining these two sets (Creswell, 2017). The quantitative aspect focused on the time spent by physical education teachers on warm-up activities, student involvement, the efficacy of warm-up activities, and the types of warm-up activities. Meanwhile, the qualitative segment involved responses to open-ended questions regarding physical education teachers' perceptions of warm-up activities.

Participants

The study involved physical education teachers from public schools in Aksaray province during the 2023-2024 academic year. Participants were selected through an open sampling approach (Corbin & Strauss, 2014), a form of convenience sampling. This method allowed individuals who met the inclusion criteria and ex-

pressed interest in the topic to participate. When we examined the participants, it consisted of 103 volunteer physical education teachers, including 47 females (45.6%) and 56 males (54.4%). The participants' age distribution was as follows: 19.4% (*n*=20) were aged 21-30, 39.8% (*n*=41) were aged 31-40, 35% (n=36) were aged 41-50, and 5.8% were aged 51 and over. Regarding professional experience, 22.3% (*n*=23) had 1-5 years of experience, 33% (*n*=34) had 6-10 years, 15.5% (*n*=16) had 11-15 years, 14.6% (*n*=15) had 16-20 years, and 14.6% (*n*=15) had more than 21 years of experience. Additionally, 56 participants (54.4%) worked in middle schools, while 47 (45.6%) worked in high schools. The minimum sample size was calculated using the G*Power 3.1.9 program, with 95% statistical power and a margin of error 0.05. The inclusion criteria required participants to be full-time physical education teachers with at least one year of teaching experience.

The study adhered to ethical standards as outlined in the Declaration of Helsinki. The Aksaray University Human Research Ethics Committee (approval document number 2024-290) granted ethical approval. Before the study, an electronic survey was distributed to willing participants via email, social media groups, and personal accounts. Participants received a consent form that detailed the study's purpose, timeline, inclusion criteria, and their right to withdraw at any time.

Data Collection Tool

The data collection tool used in the study was developed based on the questionnaire used by Barney and Leavitt (2019) to determine physical education teachers' perceptions of warm-up activities. The questionnaire was designed to evaluate teachers' perceptions and practices regarding warm-up activities in lessons. The questionnaire included a demographic information section with four questions to determine the participants' demographics. This section focused on variables such as teachers' gender, age, professional seniority, and level of teaching. In addition, ten questions were gathered under three main categories to evaluate teachers' perceptions and practices regarding warm-up activities. These are given below:

1. Planning warm-up activities, their duration and importance
    - How much time do you spend thinking about and planning your warm-up activities?
    - On average, how long do your warm-up activities last in a lesson?
    - Do you think introductory/warm-up activities are essential to your lessons?
2. Student participation and the effectiveness of warm-up activities
    - Do you make sure that your students participate in warm-up activities?
    - Do you think the warm-up activities are sufficient to keep the heart rate and body warm?
    - Do your students' warm-up activities help them use the rest of the lesson more effectively?
3. Methods used in warm-up activities
    - What kind of warm-up activities do you have your students do?
    - Do you allow your pupils to choose the warm-up activities they participate in? If so, do you think this motivates them more, or do they all join the activity?
    - Do you use music in your warm-up activities, and if so, what do you observe in students' movements while the music is playing?
    - Do you use competitive games in your warm-up activities? If so, do students like to compete in warm-up activities, and does competition affect their level of participation?

The validity of the questionnaire was tested through expert opinion and pilot testing. In this process, it was determined that the questions were understandable and designed for the research. Content validity was ensured by evaluating the scope of the questionnaire in line with the relevant literature and expert opinions. In particular, the content validity and comprehensibility of the structured statements were confirmed by the evaluations made with five experienced physical education teachers.

Data Analysis

The data analysis process started by examining the participant's responses to the data collection tool, and then the necessity of data screening and cleaning processes was evaluated (Tabachnick &

Fidell, 2019). Because of the examination, no blank or incompletely completed questionnaires were in the data set, so no removal was made.

In the quantitative dimension of the study, descriptive statistics were used to evaluate the demographic characteristics of the participants and their practices regarding warm-up activities. Numerical data, such as the time allocated for planning and implementing warm-up activities in lessons, was analyzed alongside responses to categorical variables, including allowing students to choose warm-up activities, the use of music during warm-ups, the inclusion of competition games in warm-up activities, the adequacy of these activities in increasing heart rate and preparing the body, and ensure student participation in these activities. The Statistical Package for the Social Sciences (SPSS) was used to perform all analyses.

A content analysis method was applied to the participants' responses to open-ended questions in the qualitative dimension. This process involved coding the data, identifying themes, organizing the data according to these themes, and interpreting the results. A detailed analysis was conducted on the 12 pages of data derived from responses to the open-ended questions, extracting codable units. 469 encoded units were obtained. Participants contributing to the qualitative dataset were anonymized and labeled "PET1, PET2, PET3..." for analysis. To ensure internal reliability, the agreement between the two researchers was evaluated using the "agreement" and "disagreement" methods recommended by Miles, Huberman, and Saldana (1994). An 85% consensus was achieved regarding the data from the open-ended questions.

Results

The analysis of physical education teachers' responses to the question “How much time do you spend thinking and planning your warm-up activities?” is outlined below.

When examining Table 1, it is evident that 10.67% (n=11) of physical education instructors did not dedicate any time to planning warm-up exercises; 9.71% (n=10) did not have a fixed duration but adjusted it based on the lesson; 38.83% (n=40) allocated 1-10 minutes; 15.53% (n=16) spent 11-20 minutes; 5.84% (n=6) devoted 21-30 minutes; 9.71% (n=10) set aside 1 hour; and 9.71% (n=10) allocated a day or longer. Based on the data, it is apparent that most

Table 1
Time Allocated by Physical Education Teachers for Planning Warm-up Activities

Planning Time	***n***	**%**
Never	11	10,67
No specific time (Changing)	10	9,71
1-10 minutes	40	38,83
11-20 minutes	16	15,53
21-30 minutes	6	5,84
31-60 minutes	10	9,71
1 day and over	10	9,71
Total	103	100

physical education teachers spend between 1 and 30 minutes planning warm-up activities.

The physical education teachers' answers to the question, "How much time do you spend on average for warm-up activities in a lesson?" are presented in the table below.

According to Table 2, 5.8% (*n*=6) of physical education teachers spent 3-5 minutes, 34% (*n*=35) spent 6-7 minutes, and 60.2% (*n*=62) spent 8 minutes or more on warm-up activities during a lesson.

Table 2
Lesson Time Allocated to Warm-Up Activities

Warm-up Time	**n**	**%**
3-5 minutes	6	5,8
6-7 minutes	35	34
8 minutes and over	62	60,2
Total	103	100

The analysis of physical education teachers' responses to the question "Do you think that warm-up activities are an important part of your lessons?" is as follows:

All participating teachers emphasized the significance of warm-up activities in their lessons. They believe that warm-ups help prevent injuries and prepare students for class activities. PET1 mentioned, "I find it crucial as it primes students physically and mentally for the lesson and activities." PET2 expressed, "I view it as highly important for students to engage in general and specific warm-ups relevant to the topic, preparing their bodies for the main tasks." PET3 highlighted, "It is essential to prevent sports injuries and identify activities that prepare for the lesson."

The content analysis of physical education teachers' answers to "What kind of warm-up activities do you have your students do?" is presented below.

When the answers are analyzed, the ones given by physical education teachers to this question on the questionnaire vary. Physical education teachers' most frequently preferred warm-up activities are running, playful, and stretching exercises. In addition, most physical education teachers said they like to use many activities together instead of a single activity. In this regard, PET21 stated, "I have students warm up with low-tempo running activities, stretching exercises, and educational games." PET30 stated, "Low-tempo 5 minutes running followed by stretching exercises." PET42 stated, "I try to use dynamic and static warm-ups to appeal to the muscle groups suitable for the study as much as possible."

The content analysis of the physical education teachers' answers to the question, "Do you think the warm-up activities that your students participate in help them spend the rest of the lesson more effectively?" is presented below.

Most physical education teachers stated that the warm-up activities were beneficial for spending the rest of the lesson effectively. When asked how warm-up activities are valuable, PET7 answered, "Yes, it helps them to adapt to the lesson, prepare their bodies, and prevent injuries"; PET50 answered, "Yes, the lesson is taught more actively"; PET71 answered, "Yes, it enhances flexibility because it creates a joint range of motion"; PET92 answered, "Yes, it is more motivating." Teachers preferred warm-up activities to make students participate more actively in the lesson, motivate them, and prevent injuries. On the other hand, one physical education teacher stated that the students saw the warm-up activities as a waste of time, an-

other noted that they were somewhat practical, and a third teacher said he had no idea. Another stated that the warm-up activities had no effect.

The content analysis of the answers given by the physical education teachers to the question "Do you give your students a chance to choose the warm-up activities in the lesson, and if so, do you think that the students are more motivated or all of them are involved in the activity?" is presented below.

When the answers were analyzed, it was determined that 63 (61.2%) physical education teachers said yes, and 40 (38.8%) said no. PET19 stated, "Yes, the warm-ups at the beginning of the lesson allow students to derive new educational games with their creative ideas and applications after a while." PET62 stated, "When they choose the activity themselves, participation is more active and aware with a sense of responsibility." Their peers also actively participate in the lesson with the ambition to produce a better activity and think, "that I can do better." PET87 said, "Yes, I sometimes believe I ensure they understand their wishes are important to me by letting them play the games they want." Physical education teachers stated that allowing students to choose warm-up activities increases active participation in the lesson and socialization in the classroom, with the emergence of a sense of happiness and competition.

The content analysis of the physical education teachers' answers to the question, "Do you use music during your warm-up activities, and if so, what do you observe in the students' movements while playing music?" is presented below.

Twenty-three physical education teachers (22.3%) said they use music in warm-up activities, while 80 (77.7%) do not. The physical education teachers who answered yes noted that the students performed the movements more rhythmically when accompanied by music, and the participation and enjoyment levels increased. In this regard, PET3 stated, "When I use music, students are more energetic, active, and concentrated, and show a more enthusiastic attitude than during movements without music." PET33 stated, "It makes the movements more fun and rhythmic." In addition, new movement groups emerge more freely with the effect of music, and students' active participation is ensured spontaneously. PET91 stated that '"More rhythmic movements emerge with music."

Content analysis of physical education teachers' answers to the question "Do you use competition games in warm-up activities? If so, do students like to compete in warm-up activities, and do competitions affect their participation levels?" is presented below.

When the responses of the physical education teachers were analyzed, it was determined that 78 (75.7%) of them used competition games in warm-up activities, while 25 (24.3%) did not. Teachers stated that when they used competitive games, students enjoyed them more than other activities and participated more willingly and effectively in the lesson. In this regard, PET88 stated, "The warm-up period becomes more active and fun"; PET94 stated, "I observe that their energy increases and they become more motivated"; PET102 stated, "The competitive approach in schools is erroneous when many academic articles are examined. I agree that the aim of physical education should be for all students, focusing on the development of fundamental movement skills. With the competitive approach, talented students come to the forefront, while others resent the lesson because they cannot succeed and fall behind. I prefer games in which physical and mental development is prioritized in warm-ups. Therefore, physical characteristics alone are not enough to achieve the result." As can be understood from the sample answers, the participants' opinions about using competition games in warm-up activities vary.

In addition, all of the physical education teachers who participated in the study answered yes to the questions "Do you ensure that your students participate in warm-up activities?" and "Do you think that warm-up activities are sufficient to increase heart rate and warm-up the body?"

Discussion and Conclusion

This study aims to determine physical education teachers' perceptions of warm-up activities. The study provides information about the importance of warm-up activities in physical education classes, teachers' choice of warm-up activities, preparation and implementation times, and how they benefit students.

The study found that the physical education teacher spends between 1 and 10 minutes planning warm-up activities. In addition, the majority of physical education teachers stated that the duration of warm-up activities in the lesson was 8 minutes or more. This du-

ration also coincides with the durations reported in Grajciarová's (2023) study, where the average warm-up duration was 6 minutes and 8 seconds in 45-minute classes and 8 minutes and 50 seconds in 90-minute classes. Different studies on the optimal warm-up time suggest that the warm-up should be long enough to increase body temperature and short enough not to decrease physical performance. Jamshidi et al. (2016) stated that significant performance improvements were observed after only 10 minutes of warm-up in their study, while Pardeiro and Yanci (2017) stated that 25 minutes of warm-up caused a decrease in physical performance.

When the views of physical education teachers on the importance of warm-up activities were examined, they stated that warm-up exercises are essential in lessons because they help students prepare for classroom activities and prevent injuries. In parallel with the findings of our study, Barney and Leavitt (2019) also stated that physical education teachers see warm-up exercises as an essential part of lessons. In addition, most of the physical education teachers who participated in our study said that warm-up activities benefit spending the rest of the lesson effectively. Likewise, Pangrazi & Beighle (2016) emphasize that warm-up exercises help children become physiologically ready for physical activity.

It is seen that the most preferred warm-up activities of physical education teachers are running, playful activities, and stretching exercises, respectively. Barney and Leavitt (2019) also stated in their study that physical education teachers often prefer activities involving the whole class, such as dynamic stretching, static stretching, running, and games in warm-up activities. Grajciarová's (2023) study stated that the most common focal points in the warm-up process were dynamic exercises and static stretching movements. Effective warm-ups can include dynamic stretches and sport-specific drills, essential for injury prevention and performance enhancement (Li et al., 2023; Opplert & Babault, 2018).

In the study, physical education teachers stated that the warm-up activities were beneficial for spending the rest of the lesson effectively. In the study, physical education teachers reported that warm-up activities were helpful for effectively conducting the rest of the lesson. It has been suggested that warm-up routines are critical for maximizing performance by increasing readiness and providing significant benefits (McCrary et al., 2015; Neiva et al., 2014). Similarly,

McGowan et al. (2015) emphasized that a well-structured active warm-up improves performance in various sports. At the same time, such routines can potentially prepare students physically and mentally for activities in physical education classes. These findings suggest that integrating structured warm-up routines into physical education classes can increase students' overall engagement and performance and thus optimize the educational outcomes of these classes.

It was found that most physical education teachers allowed their students to choose warm-up activities and observed various positive outcomes related to this approach. Teachers reported that when students were allowed to choose activities, their engagement, motivation, and sense of responsibility increased. These views align with the literature suggesting that participatory approaches in physical education promote active engagement and social interaction among students (Munk & Agergaard, 2018). Teachers can create a more inclusive and socially connected environment by involving students in learning through activity selection and valuing their interests and aspirations. Applying this approach to warm-up activities promotes physical engagement and allows students to prepare both physically and psychologically.

According to another study finding, most physical education teachers do not utilize music in warm-up activities. However, when Karow et al. (2020) examined how warm-up music affects exercise performance, they found that individuals who listened to it performed significantly better than those who did not. They concluded that warm-up exercises, including music selection, could increase motivation and psychological readiness for physical activity. Furthermore, Barney et al. (2016) and Barney and Prusak (2015) state that music is an effective tool to keep students active during introductory and warm-up activities. Although physical education teachers do not prefer music in warm-ups, they actively use games in their lessons, according to our study. Teachers think that games increase students' participation in the lesson, facilitate motivation, and make warm-ups more fun. These results are consistent with the studies' findings (Gunawan et al., 2023).

The results obtained from this study show that physical education teachers consider introductory and warm-up activities as an essential part of the lesson and spend sufficient time preparing and

implementing warm-up activities. Our findings align with many studies in the literature (Barney & Leavitt, 2019; Pangrazi & Beighle, 2016).

Although it is stated in the literature that the use of music helps to create a positive atmosphere for students' participation in introductory/warm-up activities (Barney &Leavitt, 2019; Barney & Prusak, 2015), our study shows that very few physical education teachers prefer music. In this regard, it is important to encourage physical education teachers to use music in their lessons, especially in the warm-up section, and to increase their awareness of this issue in future studies.

Conclusion

This study emphasized the critical role of warm-up activities in physical education classes and their perceived benefits by physical education teachers. Teachers believe warm-up exercises are necessary to prepare students for the lesson and prevent injuries. Most of the teachers stated that 8-10 minutes of warm-up time is sufficient in lessons, which aligns with the existing literature. It was observed that the study's most commonly used warm-up activities were running, fun activities, and stretching, which were in line with the methods recommended in the literature to encourage student engagement and optimize performance. It was also found that allowing students to choose their warm-up activities positively affected engagement and motivation, and this participatory approach created a more inclusive and socially interactive learning environment.

In general, using music is not common in warm-up activities, but previous studies have shown that music positively affects motivation and psychological readiness. In this context, it was suggested that including music in warm-up exercises might provide additional benefits. The study's findings emphasize the importance of well-structured warm-up routines and the need for physical education teachers to consider motivational enhancers such as student participation, activity selection, and music. These elements can provide a more effective and engaging learning experience. Future studies could examine the effects of music use on warm-up activities and how physical education teachers can integrate more innovative strategies into their classroom practice.

Limitations

Physical education teachers working in public schools in Turkey participated in this study. In addition, this is the second study to examine physical education teachers' perceptions of warm-up activities. Therefore, the ability to interpret and compare the study's findings with previous studies was limited. Due to the scarcity of studies on this topic, this study contributes to the literature.

Recommendations

In line with the findings obtained from this study, it is recommended that different activities such as yoga and Pilates should be included in addition to activities such as running, game-based activities, and stretching, which are preferred mainly by teachers for warming up. This may contribute to diversifying students' motor skills. Furthermore, integrating technology into warm-up activities allows students' performance and participation to be monitored through interactive applications and wearable devices. Warm-ups can be student-led to increase students' participation in warm-up activities and develop their leadership skills. Considering the critical importance of warm-up exercises in injury prevention, regular training programs should be organized for teachers to keep their knowledge and skills up-to-date on injury prevention warm-up techniques and activity diversity. Finally, the study reported that music was not used in the warm-up activities; however, it is thought that music has the potential to increase students' motivation and raise their energy levels. In this context, it is recommended that studies be conducted to evaluate the positive effects of music on warm-up activities.

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PHYSICAL FITNESS

Effectiveness of MyFitnessPal Application Among Senior High School Students

Billy Jeen M. Martin

Abstract

This study aimed to test the effectiveness of a six-week intervention using a smartphone application to promote overall wellness among the participants. The study utilized a Quantitative Pre-experimental One Group Pre-test Post-test Research Design among the senior high school students of Western Mindanao State University (n=51) who were officially enrolled during the academic year 2022-2023. The findings of this study contributed to the growing literature on the use of technology in health promotion interventions and provide insights into the effectiveness of using smartphone applications to promote fitness lifestyle. The data showed that all individuals, regardless of demographics, had improved their cardiovascular and muscular endurance significantly. Notably, weight changes varied by sex, with men having gained weight and females having maintained their weight. Based on these findings, the author advocated adding a muscular endurance category to the MyFitnessPal program, as well as offering flexibility training for free alongside cardio and strength activities. Additionally, physical educators and gym instructors were encouraged to use MyFitnessPal as an innovative teaching tool. Further research should focus on the long-term impact of MyFitnessPal usage on health outcomes.

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Introduction

The rising ubiquity of sluggish habits and accompanying health issues requires creative measures to enhance a healthy lifestyle. Digital health solutions, such as fitness apps, provide a potential path for boosting health-related fitness of individuals. Statistics on students' fitness levels have indicated a troubling trend. Syamsuramel (2020) discovered that the majority of physical education students were in low physical condition, with no students falling into the good or exceptional categories. Similarly, Anggita (2019) reported that, although the average fitness level of sports science students was high, a significant proportion of them lacked fitness. Nurhasan (2020) backs this viewpoint, stating that male students' musculoskeletal fitness and female students' cardiorespiratory fitness both had room to improve. Shakhyan (2022) noted that high school students had a propensity to overestimate their physical fitness, suggesting a probable lack of understanding of their true fitness levels. According to the World Health Organization's physical activity report card covering 15 Asian jurisdictions, the Philippines need to increase physical activity levels among children and adolescents. The government should develop a national plan or strategy aimed at encouraging physical activity among youth (Huang 2022). Furthermore, a study was conducted which indicated that despite government regulations linked to dequantity of physical exercise for health, implementation remains limited and physical inactivity continues to be a major concern. The report card underlines the need to strengthen efforts in converting current regulations into quantifiable programs, establishing better physical activity possibilities for young people, and building national physical activity monitoring methods. Also, it offers a baseline for tracking changes in physical activity among children and adolescents in the Philippines (Cagas 2022). Experts advise creating a thorough national strategy that supports many types of physical activity, lowers sedentary behavior, and uses a whole-of-systems approach to inspire active healthy lives among young Filipinos (Palad, 2023). Collectively, these studies emphasize the necessity for programs to improve students' fitness levels. By developing interventions that address these challenges, we can help students become healthier and more active.

The study aimed to determine the effectiveness of the MyFitnessPal application among senior high school students at Western Mindanao State University. Specifically, the study intended to answer the following questions:

1. What is the respondent's profile in terms of:
   1.1 Age
   1.2 Sex
   1.3 Height
   1.4 Weight
   1.5 Weight Profile Program
2. What is the fitness level among Senior High School Students before and after intervention of MyFitnessPal application in terms of
   2.1 Cardio
   2.2 Muscular Endurance
3. Is there a significant difference on the fitness level of senior high school students before and after intervention when grouped according to profile?
4. Is there a significant relationship on the fitness level of senior high school students after intervention when categorized according to:
   4.1 Age
   4.2 Sex
   4.3 Height
   4.4 Weight

Review of Related Literature

Noncommunicable Diseases (NCDs) in the Philippines

With a large share of deaths (Belarga 2022), noncommunicative disorders (NCDs) pose a major health threat to the Philippines. Affecting millions of Filipinos, common NCDs include hypertension, diabetes, and chronic obstructive pulmonary disease (Belarga 2022). Poor nutrition, physical inactivity, tobacco smoke exposure, and environmental contaminants also include NCD risk factors (Belarga 2022; Santiago, 2015). To handle the NCD load, the Philippine government has instituted regulatory rules and preventive plans (Belarga 2022). Particularly in poor and moderate-income nations, the co-occurrence of health costs in populations experiencing transition presents major economic difficulties (Belarga 2022).

Smartphone Usage and Health Apps

With research suggesting that 61%–83% of individuals use smartphones (Ernsting 2017; Paradis 2021), smartphone use and health applications have increased in usage in recent years. Mostly focused on wellness, prevention, exercise, and medication management, health applications also address chronic disease management, symptom tracking, and health education. Health applications are more frequently used by younger people, social media users, urbanites, and younger people (Paradis 2021). These programs provide chances for health behavior modification, self-monitoring, and patient empowerment, as well as for improving healthcare delivery and strengthening communication between patients and healthcare providers (Kratzke & Cox, 2012; Seçkin & Kahana, 2015). App use varies depending on age, socioeconomic level, and health literacy (Ernsting, 2017). Common health applications include planning, reminders, motivation, and information providing (Ernsting, 2017). More study is required to grasp their efficacy and possible influence on healthcare delivery as smartphone health apps show promise for improving health outcomes and supporting treatments (Kratzke & Cox, 2012; Seçkin & Kahana, 2015).

mHealth Concepts and Applications

Leveraging mobile technology for healthcare delivery and monitoring, mobile health—mHealth—represents the progression of telemedicine and eHealth (Raskovic 2008). It includes blood glucose tracking, vital sign monitoring, and smartphone-based sensor systems among other uses (Baig, 2014). In resource-constrained environments, mHealth has several advantages, including better service delivery, more patient-doctor interaction, and preventive behavior promotion (Paglialonga 2019). Driven by interactions and synergies between many stakeholders, the mHealth industry is changing (Adibi, 2014).

Gamification in mHealth

In mHealth apps, gamification has showed potential for enhancing management of chronic diseases and encouraging long-term health practices. Particularly among healthier and younger people, studies have demonstrated that adding game components such points, badges, challenges, and social interaction might raise user

motivation and intention to use mHealth applications (Lee et al., 2017; Miller et al., 2016). By improving perceived behavioral control and intrinsic motivation, gamification has shown promise in helping attempts at smoking cessation (Sherwani et al., 2016). Effective gamification implementation depends critically on functional usefulness, user alignment, and goal. But as gamification in mHealth calls for analyzing personal health and usage data, its incorporation poses privacy issues as well (Schmidt & Schiering, 2021). Notwithstanding these difficulties, gamification in mHealth apps presents chances to augment conventional behavioral support elements in healthcare treatments and promote regular app use, thus perhaps improving the health results (Miller et al., 2016; Sherwani et al., 2016).

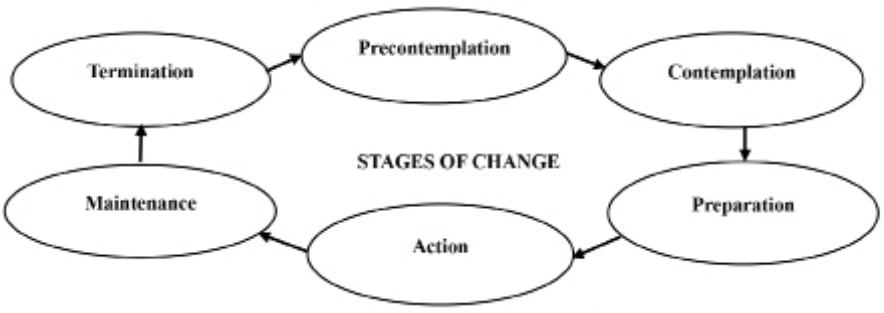
MyFitnessPal Application

Popular smartphone software MyFitnessPal (MFP) helps with weight control objectives by monitoring nutritional consumption (Evans, 2016). mHealth applications can help encourage healthy lives and perhaps even prevent noncommunicable diseases.

Theoretical Framework

This study was guided by Health Behavior Theory, which is essential for analyzing and predicting people's health-related actions. Among the different theories, the Transtheoretical Model (TTM), see Figure 1) often known as the Stages of Change model, was created in the late 1970s by psychologists James O. Prochaska and Carlo C. DiClemente. It is a well-known concept in the field of health behavior change. According to this theoretical paradigm, individuals go through several stages while adopting new behaviors, such as starting to use a fitness app. Researchers can use the pre-test post-test de-

Figure 1
The Transtheoretical Model



sign to analyze changes in participants' stage of change, self-efficacy, attitudes, or other relevant domains to evaluate the influence of the fitness application on behavior change.

The Transtheoretical Model (TTM) is a health psychology paradigm that categorizes behavior change into six stages: precontemplation, contemplation, preparation, action, maintenance, and termination. It seeks to comprehend elements such as decisional balance and self-efficacy in the context of behavior change, such as the adoption of new habits. According to the approach, in order to effectively modify their health habits, people need a variety of intervention options suited to each stage.

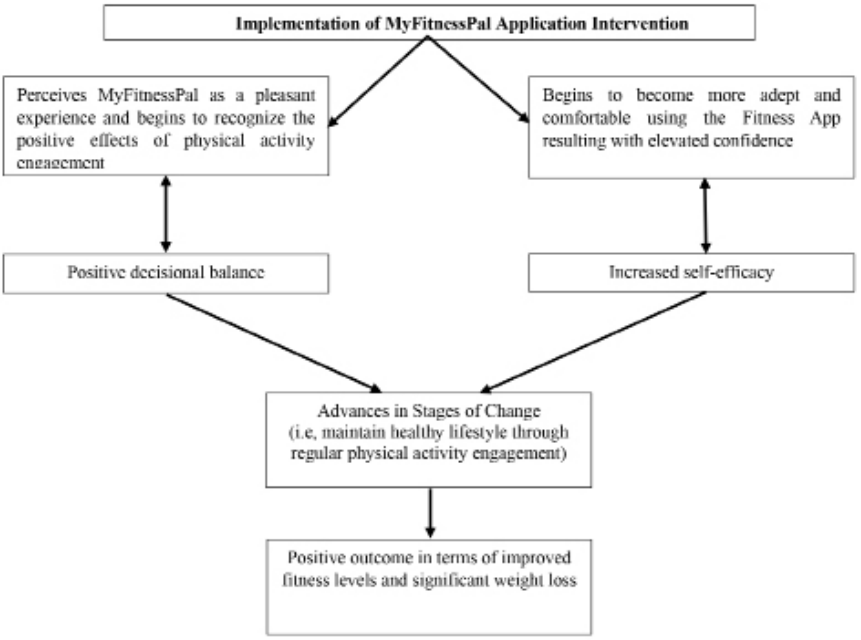
- **Precontemplation:** Learn about the advantages and get motivated with instructional information and positive words.
- **Contemplation:** To overcome uncertainties, make educated judgments by creating objectives, evaluating progress, and reviewing success stories.
- **Preparation:** Prepare for action with training regimens, exercise demonstrations, and food recommendations.
- **Action:** Maintain engagement with individualized exercises, reminders, and performance feedback.
- **Maintenance:** Use habit monitoring, social support elements, challenges, and incentives to stay motivated.
- **Termination:** Make exercise a habit with regular coaching to sustain the beneficial transformation.

Figure 2 illustrates the hypothesized effect of using the MyFitnessPal application on the participants' behavioral change process and fitness outcomes, based on the Transtheoretical Model (Stages of Change).

It shows that as students engage with the application, they may progress through the stages of change (from awareness to action and maintenance), leading to increased self-efficacy, improved decisional balance, and a more positive attitude toward physical activity.

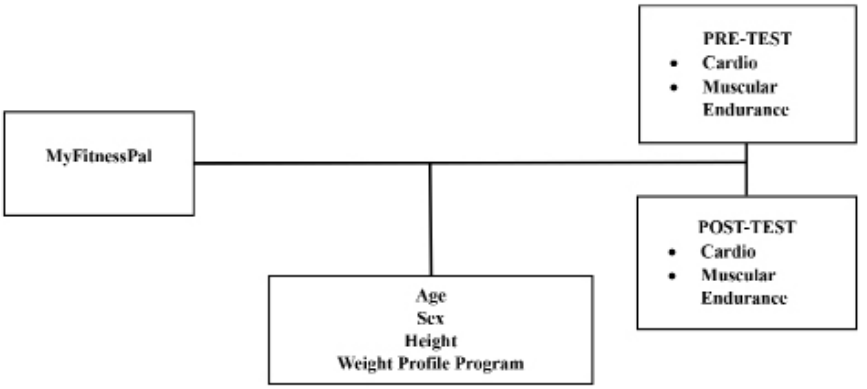
Ultimately, this behavioral improvement is expected to result in better cardiovascular fitness, improved muscular endurance, and possible weight improvement after the intervention.

Figure 2
Hypothesized Effect of MyFitnessPal Application Intervention on Stages of Change and Fitness Levels



The conceptual paradigm showed the interrelationships of the different variables of the study. The first box referred to the independent variable in the study, MyFitnessPal. This was the intervention being examined to see how the intervention affected the students' cardio and muscular endurance. The second box represented the study's dependent variable, Cardio and Muscular Endurance. These outcomes were examined to see if MyFitnessPal would increase the students' cardio and muscular endurance. The last box held the respondents' age, gender, height, weight profile program, which served as the moderating variables for the study. These factors established the significant differences and relationship on the effectiveness of MyFitnessPal application in improving cardio and muscular endurance in relation to senior high students' health-related fitness.

Figure 3
Conceptual Framework of the Study



Material and Methods

Research Design

This study employed a quantitative research design, specifically adopting the pre-experimental one group Pre-Test Post-Test. This quantitative methodology was selected because it enabled the researcher to track and evaluate changes in a variable over time using statistical methods. The quantitative approach involves scrutinizing a concept by establishing specific assumptions and gathering evidence to either validate or challenge those assumptions (Creswell, 2014). In the realm of quantitative research, data collection revolves around measuring attitudes and subsequently analyzing the gathered information through statistical methods and assumption testing.

Research Locale

The study setting was carefully selected at a public university in Zamboanga City. Because of the researcher's university connection, this choice made the study simpler to conduct, making it easier for participants to participate and perhaps enhancing the quality of responses from school heads. Additionally, the site complements the research's emphasis on Region IX senior high school students, enabling the researcher's community to directly benefit from the results.

Research Respondents

The study's target population was WMSU Grade 12 HUMSS Senior High Students for the academic year 2022–2023. Fifty-one students from grade 12-Garganera were selected as participants using Purposive Sampling, out of 94 HUMSS students in total. To guarantee a feasible research design, the study only used one portion. Ages 17 to 20, official WMSU registration, voluntary signing of the informed consent form (ICF), and participation in the physical education and health courses were the inclusion criteria. This procedure guaranteed that the chosen participants closely matched the goals of the study and could provide insightful opinions on the designated topic.

Research Instrument

For both pre-test and post-test data collection, the researcher used a self-structured questionnaire that corresponded to the MyFitnessPal Application Initial Profile Goals and Health-Related Fitness Components. An expert committee assessed the instruments' content validity to assure their dependability and relevance. The questionnaire included two primary sections:

Part I: Respondent's Profile, which collects demographic information such as age, gender, height, weight, and the weight profile program.

Part II: Fitness Assessment is broken into three sections:

(a) Pre-test criteria result without the intervention, with an emphasis on cardio and muscular endurance.

(b) Treatment is examined to verify changes in criterion findings following the intervention.

(c) Post-test findings for the criteria with the intervention, measuring the effect of MyFitnessPal on cardio and muscular endurance.

Data-Gathering Procedure

The data-collecting procedure followed strict ethical requirements. Participants were recruited after receiving consent from the school administration and obtaining ethical clearance from the Philippine Normal University, Educational Policy Research and Development Center (PNU EPRDC) office, ensuring that ethical

considerations were addressed. Inclusion requirements guaranteed that Grade 12 HUMSS students fell within a certain age range and were enrolled in appropriate courses. To improve data collection, participants received a virtual orientation that explained the project and answered any questions they had. We got informed consent forms, with minors requiring parental approval. Baseline data was collected using a self-administered pre-test questionnaire created using Google Forms. The data gathering technique was conducted with strict respect to health regulations. After a 6-week intervention phase in which individuals used the MyFitnessPal app, a post-test replicated the pre-test methods. This resulted in consistent data collecting for comparative analysis. The researcher gathered and kept all participant data securely.

Statistical Tools

The data were analyzed using the following statistical tools:

The researcher utilized frequency count and percentage to determine the demographic profile of the respondents to answer and solve research question number one (1).

To answer and solve research question number two (2), the researcher utilized the mean to determine what the fitness level of senior high school students before and after intervention of MyFitnessPal Application in terms of cardio and muscular endurance.

To answer research question number three (3), T-test was used to determine if there was a significant difference in the fitness level of senior high school students before and after intervention when grouped according to sex. Meanwhile, ANOVA test was used for variables age, height, and weight.

To answer research question number four (4), regression analysis test was used to determine if there was a significant relationship in the fitness level of the senior high school students after intervention when grouped according to profile.

Ethical Considerations

In the study, the researcher considered and gave priority to ethical and moral issues and addressed the study protocol in conducting research. The study protocol was submitted to the Philippine Normal University Technical Review Board for review and approval. The proposed study was implemented after its approval from the

Technical as well as Ethics Review Boards. All information derived from this study was treated confidentially. An informed assent was secured from the respondents. Results of the study were readily available for those interested in the outcome of the study.

Conflict of Interest

The proponent's workplace was included in the research site. To reduce or avoid conflicts that could have occurred as a result of this, the researcher closely adhered to the set procedures throughout the course of the investigation. Also, the researcher is the teacher of the class.

Voluntary Participation

This study ensured that participation of the participants was entirely voluntary. Before the interview, participants were informed that their participation would be of their willingness, and they were not obliged to answer questions that they felt objectionable or uncomfortable. At any point during the study, if participants wanted to withdraw from participating, they were also allowed to do so without any consequences or penalties. Furthermore, there was no monetary or material remuneration in exchange for their individual cooperation to the benefit of the researcher.

Privacy and Confidentiality

All data gathered, including the participant's identifying data, were treated with utmost privacy and confidentiality. To ensure privacy, each interview was held at an undisclosed site. To ensure confidentiality, pseudonyms were used in the data and were not disclosed to anyone. The data from the survey questionnaire and the proceedings from the interview were utilized for research purposes only. All information provided remained confidential and was reported with no identifying information.

Vulnerability

Special consideration was given to vulnerable participants, considering their comfort level during research participation. They were guaranteed the safeguarding of their rights and were not subjected to coercion, exploitation, or manipulation to express their ideas and beliefs. Additionally, those who chose not to engage were free to do so without any negative consequences.

Risks and Benefits

The research participants were notified that there may have been a foreseeable risk associated with their involvement in this research project, such as discomfort or annoyance while disclosing information about their institution's accreditation status. If this occurred, they would not have been coerced or compelled to do so. They were cautioned, however, that their identity would be kept private. If participants chose to withdraw from the study at any time throughout the study, they could have done so without any consequences or sanctions.

Informed Consent/Assent Process

The researcher disclosed the entire purpose, the process of the research study, as well as the potential benefits to the respondents and the institution. To guarantee voluntary and informed involvement, the researcher also sought informed consent from all survey takers and interview participants. To do this, the researcher first informed and explained to the participants the goal of the Informed Consent/Assent Form, as well as its advantages and impact. Throughout this procedure, participants were allowed to seek explanations and raise concerns about the study. The Informed Consent/Assent Form had to be completed before participants could answer survey and interview questions.

Results and Discussion

Table 2.1
Cardio

a. Male

Before	Descriptor	After	Descriptor
106.54	Below Average	88.85	Good

The table shows the cardio-heart rate test before and after intervention for the male senior high school students. Before intervention, the average cardio heart rate was 106.54 with an equivalent descriptor of "below average," and after intervention, it was 88.85 with an equivalent descriptor of "good."

b. Female

Before	Descriptor	After	Descriptor
116.24	Average	98.6	Good

The table shows the cardio-heart rate test before and after intervention for the female senior high school students. Before intervention, the average cardio heart rate was 116.24 with an equivalent descriptor of "average," and after intervention, it was 98.6 with an equivalent descriptor of "good."

Table 2.2
Muscular Endurance

a. Male

Before	Descriptor	After	Descriptor
16.58	Below Average	27.77	Average

As can be seen in the table, before the intervention, the average muscular endurance test was 16.58 with a corresponding description of "below average," while after the intervention, the muscular endurance test was 27.77 with a corresponding description of "average."

b. Female

Before	Descriptor	After	Descriptor
7.28	Average	12.88	Above Average

As can be seen in the table, before the intervention, the average muscular endurance test was 7.28 with a corresponding description of "average," while after the intervention, the average muscular endurance test was 12.88 with a corresponding description of "above average."

Table 3.1
a Age

Age	N	*P*-value	Interpretation	Decision
17 years old	21			
18 years old	20			
19 years old	2	0.060	Not Significant	Accept Ho
20 years old	8			

*Significant @ ∝ = 0.05

When grouped according to age, The ANOVA test result showed a significant value of 0.060, which was greater than the alpha level of 0.05, so the null hypothesis was accepted.

Table 3.1
b Sex

Sex	N	*P*-value	Interpretation	Decision
Male	26	0.587	Not Significant	Accept Ho
Female	25			

*Significant @ ∝ = 0.05

When categorized according to sex, the T-Test test result shows a significant value of 0.587, which was greater than the 0.05 level of significance, so the null hypothesis was accepted.

Table 3.1
c Height

Height	N	*P*-value	Interpretation	Decision
150-160 cm	22			
161-170 cm	18			
171-180 cm	10	0.912	Not Significant	Accept Ho
181-190 cm	1			

*Significant @ ∝ = 0.05

When grouped according to height, the ANOVA test result shows a significant value of 0.912, which is greater than the 0.05 alpha level, so the null hypothesis is accepted.

Table 3.1
d Weight

Weight	N	*P*-value	Interpretation	Decision
40-50 kgs	15			
51-60 kgs	20			
61-70 kgs	13	0.937	Not Significant	Accept Ho
71 kgs above	3			

*Significant @ ∝ = 0.05

The ANOVA test result shows a significant value of 0.937, which is greater than the alpha level of 0.05, so the null hypothesis is accepted.

Table 3.2
b Sex

Sex	N	*P*-value	Interpretation	Decision
Male	26			
Female	25	0.000	Significant	Reject Ho

*Significant @ ∝ = 0.05

When grouped according to sex, The ANOVA test result showed a significant value of 0.000 which was less than the 0.05 level of significance, so the null hypothesis is rejected.

Table 3.2
c Height

Height	N	*P*-value	Interpretation	Decision
150-160 cm	22			
161-170 cm	18			
171-180 cm	10	0.039	Significant	Reject Ho
181-190 cm	1			

*Significant @ ∝ = 0.05

When grouped according to height, The ANOVA test result showed a significant value of 0.039 which was less than the 0.05 level of significance, so the null hypothesis is rejected.

Table 3.2
d Weight

Weight	N	*P*-value	Interpretation	Decision
40-50 kgs	15			
51-60 kgs	20			
61-70 kgs	13	0.130	Not Significant	Accept Ho
71 kgs above	3			

*Significant @ $\propto = 0.05$

When grouped according to weight, The ANOVA test result showed a significant value of 0.130 which was greater than the 0.05 level of significance, so the null hypothesis is accepted.

Table 4.1
Age

Variable	Correlation Value (*R*-value)	Sig. Value (*P*-value)	Interpretation	Decision
Fitness Level *Age	0.337	0.127	Not Significant	Accept Ho

*Significant @ $\propto = 0.05$

The regression analysis result showed a significant value of 0.127, which is greater than the alpha level of 0.05, and, thus, there was no statistically significant relationship between the fitness level and the age of the respondents.

Table 4.2
Sex

Variable	Correlation Value (*R*-value)	Sig. Value (*P*-value)	Interpretation	Decision
Fitness Level *Sex	0.187	0.190	Not Significant	Accept Ho

*Significant @ ∝= 0.05

The regression analysis result showed the significant value of 0.190, which was greater than the alpha level of 0.05, and, thus, there was no statistically significant relationship between the fitness level and the gender of the respondents.

Table 4.3
Height

Variable	Correlation Value (*R*-value)	Sig. Value (*P*-value)	Interpretation	Decision
Fitness Level *Height	0.348	0.106	Not Significant	Accept Ho

*Significant @ ∝= 0.05

The regression analysis result showed the significant value of 0.106, which was greater than the alpha level of 0.05, and, thus, there was no statistically significant relationship between the fitness level and the height of the respondents.

Table 4.4
Weight

Variable	Correlation Value (*R*-value)	Sig. Value (*P*-value)	Interpretation	Decision
Fitness Level *Weight	0.513	0.002	Significant	Reject Ho

*Significant @ ∝ = 0.05

The regression analysis result showed the significant value of 0.513, which was greater than the alpha level of 0.002, indicating that there was a statistically significant relationship between the respondent's fitness level and weight.

Conclusions

Based on the findings of the study, it can be concluded that in general, the effect of a six-week smartphone application intervention on the fitness level of the senior high school students had showed greater performance with regards to the Cardio (3-minute step test) and muscular endurance test respectively (push-ups), which is very encouraging and significant. In addition, it also showed promising impacts on the body weight of participants; whether the target was to gain weight or lose weight, they were able to achieve a consequential amount of the ideal weight goal. Thus, it can be evidently concluded that the intervention of the fitness application MyFitnessPal to the cardio and muscular endurance of senior high school students was effective.

Recommendations

The following recommendations were formulated. MyFitnessPal Application should create a separate muscular endurance listing in the choices of exercise since some of the exercises were mixed in the muscular strength category. The MyFitnessPal app should offer flexibility as one of the free choices in the exercise dashboard together with cardio and strength. User experience should be evaluated by examining factors such as overall design, user satisfaction, acces-

sibility, personalization, functionality, social features, gamification, and many more if it affects the usage duration of an Individual. Physical education teachers and gym instructors are invited to use the MyFitnessPal app, integrating it into their teaching method as means of innovative strategy. Future researchers should consider anticipating the intent of respondents' fitness program with the most appropriate tests.

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PHYSICAL ACTIVITY

Morning or Afternoon Physical Activity Classes?: What Time of the Day Works Best for College Students

David C. Barney and Kamora Johnson

Abstract

College students' lives are busy with everything from schoolwork to jobs and other extracurricular activities. One aspect of their lives is being physically active, or in some cases not being physically active. Colleges and universities offer physical activity (PA) classes throughout the week on certain days and throughout the day. The purpose of this study was to better understand why and what time of the day college students enroll and participate in college PA classes. For this study, college students that enrolled and participated in morning (8am to noon) and afternoon (1pm to 5pm) were surveyed to better understand why they enroll and participate in PA classes in the morning or afternoon. It was generally found that college student enrolled and participated in PA classes during certain times of the day because of class and work schedules and that college students weren't morning people or wanted to end their day on a positive note. These results can be helpful for those that administer PA classes at their colleges and universities.

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Introduction

The literature has established that regular physical activity (PA) can serve to combat various diseases, such as cardiovascular disease, diabetes, and high blood pressure (Kim & Cardinal, 2017). Yet, with the mentioned benefits of PA, life can be busy pulling a person in many different directions and taking up the time throughout the day with PA taking a back seat to other activities. Research has been conducted, studying typically physical activity in the morning, afternoon, or evening. Many different populations and variables have been studied. For example, Silva et al. (2015) examined youth PA in free-time periods during high school days and their contribution to their daily PA. The free time periods investigated during the school day were 7:30 am to 8:30 am, 10 am to 10:30 am, 12:30 pm to 2 pm, 4 pm to 4:30 pm and 6:30 pm to 8 pm. It was reported that the female students had higher rates of PA during the day that were heavily participated in were because it gave the students a break from their studies and were free from the constraints of school and family responsibilities at home. A second study in the K-12 educational setting investigated the effects of classroom activity breaks at different times of the day on on-task behavior and PA levels in children (Broad, et al., 2023). For this study, first through third grade students participated in the study. The researcher used four different time sessions, they were: 1) morning (AM), 2) afternoon (PM), 3) both morning and afternoon, and 4) no activity breaks. Each session lasted 30 minutes in length. It was found that performing two classroom activity breaks—one in the morning and one in the afternoon—were found to have a positive influence on important PA measures such as Moderate to Vigorous Physical Activity (MVPA) and number of steps taken. The researchers also concluded that if two classroom activity breaks were not possible, one classroom activity break would be better than not having students participate in no activities.

Another variable that literature has touched upon dealing with the time of the day PA is participated in and the effects of PA on diabetes. Ma and colleagues (2022) investigated the association of MVPA and time of day with all-cause mortality among patients with type 2 diabetes. For this study, 904 participants were assigned into either a morning workout group or evening in workout group. Participants for this study had type 2 diabetes. It was concluded from

this study that the time of day a person is physically active does not affect their type 2 diabetes. Another study focusing on time-of-day PA effect on type 2 diabetes investigated two different times (morning & evening) of PA effect on males' blood glucose levels in males. For this study, 11 males participated in a low-volume high-intensity interval training (HIIT). The researchers concluded that afternoon HIIT was more effective in improving blood glucose levels. One other study relating with morning and evening PA, investigated sleep preferences of young females, 11 to 17 years of age, trajectories of morning or evening PA (Beal et al., 2016). A couple variables the investigators focused on were the chronological or gynecological ages of the female participants. The researchers concluded that the PA trajectories for the females in this study were affected by gynecological changes that their PA took place in the evenings. These studies have differing conclusions, thus leaving more research to solidify when PA can benefit those with type 2 diabetes.

One population that hasn't been studied regarding time-of-day participation in PA is college students. A college student's life is busy. They have schoolwork, which includes assignments, papers to write, research projects, and exams (Barney et al., 2014), family (Aherne, 2001), romantic relationships (Darling et al., 2007), peers, (Allan & Lawless, 2003), expectations of self and others (Deutsch & Schmertz, 2011), lack of time (Gonzalez et al., 2010), sleep deprivation (Gold & Friedman, 2000), and in some cases going to school in a different country (Pitts, 2009). Because of college students' busy lives, they have opportunities to be physically active while attending college. In some cases, this can be when students enroll in physical activity classes at their college or university. Typically, PA classes are offered two days during the week (Monday/Wednesday or Tuesday/Thursday) with Friday-only offerings. College PA classes are offered throughout the day. Thus, the purpose of this study was to better understand why and what time of the day college students enroll and participate in college PA classes.

Methods

Participants

For this study, 203 (108 morning participants and 95 afternoon participants) college students from a private university located in the

Intermountain west of the United States participated in this study. The university Institutional Review Board (IRB) granted approval to conduct this study. The age of the student's ranged from 18 to 28 years of age. The university PA coordinator along with the class instructors gave approval to conduct the study. Student consent was also secured. The participants were enrolled in beginning bowling, beginning and intermediate volleyball, beginning tennis, intermediate basketball and beginning pickleball. The structure of the class consisted of a brief warm-up, brief instruction and approximately 40 minutes of game play.

Instrumentation

An instrument specific to addressing when college students enroll and participate in PA classes (Larson, 2006) was identified and modified through a review of literature. For this study, the technique of critical incidence was used to collect students' descriptions (See Figure 1). Critical incidence presents the ability to focus on actual experiences as opposed to general impressions (Larson, 2006). This allows for a larger qualitative participant sample and fosters a substantial amount of data about experiences and behaviors considered important (Helion, 1991). Because of the nature of this study, there was two separate surveys given. For the morning PA classes, the following questions were given; (1) Please describe why you decided to take a PA class in the morning (8am to noon), and (2) Please describe benefits you receive by taking the PA class in the morning (8am to noon). The survey questions for the afternoon classes were (1) Please describe why you decided to take this PA class in the afternoon (1pm to 5pm) and (2) please describe benefits you receive by taking this PA class in the afternoon (1pm to 5pm). The critical incidence tool allows researcher the flexibility to tailor the instrument to their specific study. Administering the critical incidence methodology helped draw out of the student's specifics of why college students enrolled in either morning or afternoon PA classes.

Procedures

Upon receiving IRB and the coordinator of the college PA classes approval, convenience sampling was employed for data collection for this study. Prior to data collection the lead researcher talked with the instructors and explained the study and what the college students

would be asked to do. The researchers attended the PA classes asking for the college student's participation in the study. The researcher explained the study and survey they would be taking. For this study, the researchers created a QR code the college students could access and respond to the survey question. When the survey was completed the students would click the 'submit' button. The researchers were able to retrieve the student's comments from this survey at a later time.

Data Analysis

For this study, the data analysis consisted of the thematic content analysis. Data were analyzed using the Check and Schutt (2011) method of analyzing qualitative data, to correlate and review participants open-ended critical incidence responses to generate preliminary coding categories. Framework analysis incorporated four stages: (1) familiarization, (2) thematic, (3) identification, and (4) charting and interpretation (Rabiee, 2004). After the researchers read through the data, they discussed the themes they drew from the survey data. Concluding on four themes for eth morning and afternoon PA classes.

Results

The researchers read and re-read the Critical Incidence data to identify themes from the data. Because of the nature of the study there are benefits for taking morning and evening PA classes. Then within each of these themes are more specific themes. The following are the themes the researchers agreed upon. The themes of the benefits of taking morning PA classes are, (1) Increased Energy, Mood and Productivity, (2) Time Management and Scheduling, (3) Healthy Habits, and (4) Social Interaction. The themes for the reasons for taking morning PA classes were, (1) Schedule Fit, (2) Starting the Day Right, (3) Energy and Focus for the Students Classes, and (4) Friend and Social Reasons. The themes for the benefits of taking an afternoon PA class, (1) Relaxation and break from schoolwork, (2) Exercise and Health Benefits. The themes for the reasons for taking afternoon classes were, (1) Avoiding Early Mornings, (2) Balancing Academics and Work Commitments, (3) End of the Day Relaxation, and (4) Taking Class with Friends.

The following are the responses from the interview data for the benefits of taking a morning PA class.

Increased Energy, Mood and Productivity

"I feel like I have more energy during my other lectures, so I pay more attention," "I find I'm more productive throughout the day and have more energy," and "Great start for me! More focused in my classes afterwards, with a good mood boost."

Fits Schedule

"It helps me be motivated to get an early start to my day and fit exercise into my busy schedule", "Get it done first—good way to get up and moving", and "Gets you prepared for the rest of the day and you can get it over with."

Healthy Habits

"I'm better at waking up in the morning, which is healthier," "I have motivation to wake up and go to bed on time," and "It stops me from sleeping in super late," and "I've met some fun people."

Social Aspects

"I start my morning off by exercising in a team sport and socialize early," "I have a lot of fun and look forward to most mornings," and "Get to have sanctioned fights with my sister, lol."

The following are the responses from the interview data for the reasons of taking a morning PA class.

Schedule Fit

"Only time pickleball was offered, but also because I have to stack all of my classes in the morning," "I have clinicals all afternoon for my master's program," and "To be honest, it was the only time that worked in my school class schedule."

Starting the Day Right/Morning Person

"It helps me to start my day off right and ensure I get to campus on time," "I like to start my morning with some physical activity to help kickstart the day," and "I'm a morning person, so doing a PA class in the morning is the best for me."

Energy and Focus

"I've found that moving my body first thing in the morning wakes me up both physically and mentally," "It energizes me in the morning, gets me excited for the day," and "I actually find that when I exercise in the morning and get my blood pumping, I am able to focus in my classes better."

Friends/Social Reasons

"I have a friend in this class," "This was the time that worked with my sister so we could take it together," and "It's when my brother was free, and we wanted to take it together."

The following are the responses from the interview data for the benefits of taking an afternoon PA class.

Relaxation and Break from Schoolwork

"It's a nice way to decompress after a long day," "PA classes help me to relax and get off some steam after a stressful day," "End my day on a high note, a nice break from homework and school," and "It has provided a nice time between classes for homework, improved my overall happiness, and given me something to look forward to consistently."

Fits Schedule

"I can take morning classes, work, and then have something fun at the end of my day," "I usually do homework in the morning, so I don't need to change my schedule to do that," and "It gives me more flexibility for classes I need to take earlier in the day."

Exercise and Health Benefits

"Exercise later in the day so I can eat a lot for dinner," "I get to exercise later in the day and play a sport that I love at the same time," and "Easy and fun way to fit exercise later in the day that holds me accountable."

Social Aspects

"I have met a bunch of fun new people, and I have enjoyed the class more," "Meeting so many new people/making new friends," and "Building social connections as I play basketball."

The following are the responses from the interview data for the reasons for taking an afternoon PA class.

Avoid Early Mornings

"I'm definitely not a morning person, and I took this PA class in the afternoon to have fun," "The reason I took this PA class in the afternoon is because I didn't want to wake up super early," and "I'm not a morning person, I stay up late, and I find it hard to wake up early."

Balancing with Academics and Work Commitments

"I like to take my academic classes in the middle of day (10 am to 2pm) and prefer my PA class later in the day," "I had other classes and work in the morning," and "My academic classes are all in the morning, I don't have time for PA class in the morning."

End of Day Enjoyment

"Good way to end my day," "I'd rather do something fun after a long day of hard work, so I have something to look forward to," and "I enjoy having the last part of my day doing something I love. Really helps me."

Discussion

The purpose of this study was to better understand why and what time of the day college students enroll and participate in college PA classes. The college students in this study discussed many reasons and benefits for enrolling and participating in morning and afternoon PA classes. The themes of benefits for taking a PA class in either the morning or afternoon had similar response. Those responses were the PA classes fit the students' class schedule and the social aspects of the PA class. From the literature it has pointed out that college students are busy, and they have many responsibilities. For example, college students have papers to write, exams to study for and take, and a number of other school responsibilities (Barney et al., 2014). There are romantic relationships (Darling et al., 2009), spending time with peers (Allan & Lawless, 2003) and many other things vying for their time. Trying to fit PA into a college student schedule, doesn't happen as it should be. From this study one student stated, "I can take morning classes, work, and then have something fun to do at the end of the day." A second student expressed, "I usu-

ally do homework in the afternoon and evenings, so I don't need to change my schedule to do that." One last student stated, "I can actually take them [PA classes] because they have plenty of classes, and it fits my schedule." The two common responses that came from both the morning and afternoon groups show that the social aspect can be manifested through interacting with their classmates as students are being physically active, leading to receiving the benefits of both.

A second theme from the benefits of taking a morning or afternoon PA class was the social aspects. The literature has pointed out that the social aspects are valuable for the fact that it helps relieve stress in a person's life. Barney et al. (2014) studied college students' perceptions of their participation in PA classes on stress in their lives. The college students from this study generally found their participation in PA classes helped them manage the stress they experienced while attending college. Yet, a secondary finding from this study was that the college students were talking and socializing during their PA class, which resulted in lowering stress in their lives. The following statements from the college students in this study were, "Building social connections, fun break between school before I do homework," "spending time with friends after a day full of class and class work," and "I get to have a sanctioned fight with my sister, lol." With these benefits coming from both morning and afternoon PA class participation, these themes can allow college students enrollment in PA classes helpful with their college studies. The results from this study point out both morning and afternoon PA classes provide a wonderful opportunity for college students to socialize while in class. College students generally are social amongst their peers. This socializing among the students has the potential to help students talk through situations, classes and other matters taking place in their life (Barney et al., 2014).

The themes for the reasons for taking either morning or afternoon class were the students were either morning people, or they avoided taking morning classes. A second reason for taking morning or afternoon PA class was a good way to start the students' day, and when taking afternoon class, it was a good/positive way to end the students' day in a positive way. From this study student comments regarding taking classes in the morning were the following, "It helps me to start my day off right and ensures I get to campus on time," "I

like to start my mornings with some physical activity to help kick-start the day," and "I prefer morning physical activity." The student comments regarding afternoon classes were, "I'm definitely not a morning person, and I took this class to end my day with something fun," "I'm not a morning person, I stay up late, and I find it hard to wake up early," and "The reason I took this PA class in the afternoon is because I didn't want to wake up super early." For both the morning and afternoon students, their comments highlighted how PA at their designated time of the day has had a positive impact on their day. The college students PA can serve as a mechanism in assisting in their studies. With both morning and afternoon participation in PA class and it being a positive way to start and end a students' day, there is a greater possibility of lifelong PA.

Implications

The results of this study should once again reinforce the importance of PA in a person's life, and more specifically for college students. College students expressed taking PA classes during the morning or afternoon and how it benefitted them. Both time periods of the day (morning or afternoon) presented college students with options for them to be physically active. A second implication of this study is that as college students participate in either morning or afternoon classes, they will come to learn what time of the day they like/enjoy being physically active or what time of the day works best for them. A final implication to this study is to better inform those at colleges and universities that oversee PA programs and scheduling that they offer throughout the day many PA offerings, so that college students have many options to work around their schedules, so they can be physically active during their college experience.

Limitations

Three limitations to this study are recognized. First, the participants came from one university. Second, students not enrolled in PA classes did not participate in this study, thus not allowing comparisons between the groups. Third, the research study was conducted at a private university. Thus, the participants may not be representative of participants from other colleges or universities or geographic regions which may limit the generalizability of the findings. Thus, the conclusions and implications are limited and perhaps mostly ap-

pliable to those participants' demographics. Further research with a wider demographic would provide a richer data set to ascertain the generalizability of the conclusions and implications in further studies.

Figure 1
Morning/Afternoon PA Class Survey

Morning Survey

1. Please describe why you decided to take a PA class in the morning (8am to noon) instead of the afternoon.
2. Please describe benefits you receive by taking this PA class in the morning (8am to noon).

Afternoon Survey

1. Please describe why you decided to take this PA class in the afternoon (1pm to 5pm) instead of a morning PA class.
2. Please describe benefits you receive by taking this PA class in the afternoon (1pm to 5pm).

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KINESIOLOGY

Undergraduate Student Perspectives of Somatic Learning in Kinesiology: The Mind-Body Connection

Emily Noton and Kristi Skebo

Abstract

In Physical Education and Kinesiology faculties in North America, undergraduate students study theoretical knowledge from various sub-disciplines (e.g., physiology, psychology, biomechanics and motor learning) and practice applied knowledge (coaching, playing sports and dance, program design, etc.). However, theory and practice are rarely combined in a single course where students are able to generate somatic knowledge. Subsequently, our faculty and the authors recently re-designed and taught several undergraduate "activity core" courses that combine anatomy, biomechanics and mind-body integration (use of breath, imagery and proprioception) through a somatic learning approach based on somatic practice. The purpose of this study is to understand if/how this somatic approach to learning enabled students to understand more fully the overlap between theory and practice in kinesiology. Likert scale questionnaires were sent to two cohorts of students having completed the first year course, KIN 156 (Introduction to Movement Fundamentals in Fitness). Forty-one of forty-three respondents indicated that the somatic learning approach of the course enabled them to better retain and apply knowledge. Our results indicate strongly that this somatic approach to kinesiology learning, the "doing" of mind-body components while executing movement fundamentals, was of significant value for undergraduate students.

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Introduction

As kinesiology researcher-instructors, we intrinsically know the value that applied and somatic knowledges have in real-life settings for our students, many of whom go on to become physiotherapists, massage therapists, personal trainers, and coaches (Kluijtmans et al., 2017). Yet, the bifurcation of theoretical and applied knowledge has become common in kinesiology faculties across North America, with quantitative research and theoretical learning often dominating the landscape (Anderson, 2020; Andrews, 2008; Kretchmar, 2008 & 2014; Newell, 2007; Vertinsky, 2009). Rather than prioritizing one type of learning/knowledge over the other, or embracing popular dichotomies in kinesiology (theoretical vs. applied, quantitative vs. qualitative) we have chosen to consider how these dualisms can be challenged by approaching teaching with the integration of various types of knowledge.

In our faculty (Kinesiology, Sport and Recreation), a new set of physical activity-based courses was recently designed, marrying quantitative sub-disciplines (anatomy and biomechanics) with qualitative, practical components (mind-body integration driven by breath, imagery and proprioception) through a somatic learning approach (the "doing" of the former components). The learning outcomes of these undergraduate courses include having students generate a holistic and comprehensive understanding of the moving body by experiencing and connecting to the feeling of their own moving bodies. Experienced movement practitioners may recognize that this description has strong ties to somatic practices, which are studied and used more extensively in dance training and research than in the subdisciplines of kinesiology. In the spirit of complementarity, as described by Kretchmar (2014), we taught a redesigned undergraduate kinesiology course with a somatic approach that draws from the first author's experience as a dancer. We noted that theory and practice were rarely combined in a single undergraduate course where students are able to generate somatic knowledge, and hence this paper's purpose is to explore student perspectives of somatic learning.

In this course, the first author was the primary instructor and the second author was a teaching assistant; both authors fully participated in movement labs by demonstrating exercises and mov-

ing with the students. While teaching this course, we were privy to overwhelmingly positive feedback from the undergraduate students during class discussions and individual conversations after class. Notable comments included "feeling the movement of the femur helps me understand the hip joint," "the double-s curve of the spine makes more sense now that I can feel it," "I actually understand where my iliac crests are," and "I had never been taught how to breathe properly." We also noted that our approach in the lab seemed to be enjoyable for the students. As we were unable to find any literature directly addressing this aspect of (somatic) movement learning in kinesiology, we began to realize that our approach was unique. Based on student feedback and our experiences in the labs, we sensed that this approach might be a "missing piece" for kinesiology students, enabling them to operationalize sub-disciplinary theoretical knowledge (such as anatomy and biomechanics). Therefore, our primary aim in this study was to dig deeper into the students' perspectives of this somatic learning approach and understand if/how this helped students bridge the gap between theory and practice. Understanding students' perspectives could have wide reaching implications for the structure of our course in the future, kinesiology curriculum/degree requirements, advising practices, and overall student success (e.g., enhancing the skills of our graduates). To do this, we used a 5-point likert scale questionnaire with questions that align with our study objectives:

a) To understand which topics in the course content were novel.
b) To understand whether the somatic learning approach was effective in helping students understand, retain, and apply knowledge.
c) To determine whether the course created overall value for students.

In the next section we briefly review the literature about somatic practice and learning, and student perspectives in kinesiology faculties.

Literature Review

At its core, this study is about demonstrating the effectiveness of a somatic pedagogical approach in undergraduate kinesiology by examining student perspectives of our approach to somatic learning.

Although common in dance settings, integrating first-person somatic learning is not typically done in kinesiology (Bennett, 2020); thus, we feel it's important to spend some time defining somatic practice/learning and its origins. In addition, we briefly discuss the literature about student perspectives of learning in kinesiology. Threaded throughout this section are differences between somatic practices used in a physical education context (dance, movement learning, sport) and those explored by scholars from a socio-cultural perspective (used, for example, in an emancipatory way). Our aim in doing so is to clarify and contextualize the physical education somatic approach we adopted for teaching the kinesiology course highlighted in this study. Rather than using the term somatic pedagogy in this paper, we use somatic learning as we focus primarily on student perspectives. These terms can be interchangeable and simply refer to the perspective being considered: that of the teacher or that of the learner.

Somatic Practice and Learning

Somatic practice and learning is the study of the soma (the living body) as experienced through the inner first-person perspective, rather than the body as an objective entity observed from a third-person viewpoint (Bresler, 2004; George, 2020; Green, 2003; Evans et al., 2009; Hanna, 1988). An early pioneer and teacher of somatic practice in the 1970s, Thomas Hanna (1988) explained that somatics was a matter of looking at oneself from the "inside out," where one is aware of feelings, movements, and intentions rather than looking objectively from the outside in (Fortin, 2017; George, 2020). Early in the development of his practice, Hanna (1983:1) defined somatics as "the art and science of the interrelational process between awareness, biological function and environment, all three factors understood as a synergistic whole." This type of training allows the mover to access essential truths of the body directly, rather than relying on authoritative feedback and judgment from an instructor (Fortin, 2017; George, 2020; Green, 1999). Thus, somatic learning entails engagement with subject matter via the body's senses, as described by Stuckey (2009). Other descriptions from Franklin (2012) and Hackney (2002) include the internal physical perceptions that the mover experiences, the body as perceived and physically felt by the

mover, and the simple act of being aware of what we are feeling and sensing while we move.

Historically, somatics, as an (American) approach to movement training, developed as a part of modern dance training practices (Eddy, 2009; Fortin et al., 2002; George, 2020) rather than from a pure sports science (for example, motor skill learning) perspective, which perhaps explains its absence from kinesiology departments despite being well integrated with movement learning in dance. In the second half of the 20th century, notable originators such as F.M. Alexander, Thomas Hanna, Margaret H'Doubler, and Mabel Elsworth Todd spread the practice via their teachings as dancers (George, 2020). Accordingly, dancers, teachers, and choreographers believed in the effectiveness of somatic practice for training the body in a fundamental way; somatic practice was believed to uncover a "natural" way of moving that did not conform to aesthetic ideals, but rather promoted natural anatomical functioning (George, 2020). In a more artistic sense, it was also popularized as an effective approach for generating original and novel movement by helping dancers derive "new" movement patterns directly from their own first-person bodily experiences, thus, in some contexts, somatic practice became a choreographic tool. As a result of its effectiveness in both scenarios (movement training/learning and movement generation) the use of somatic practices, such as body awareness and imagery, have permeated dance training, conservatories and professional companies (Eddy, 2009; Fortin et al, 2002; Green, 1999, 2002; Kirk, 2014). Although this development is seen as originating in America, hubs of somatic training also developed in Australia, Canada, England, Holland, Germany, and elsewhere throughout Europe (George, 2020). Today, the use of somatic practice is ubiquitous in many forms of dance, both in and beyond university dance settings, while still remaining underused in kinesiology (Bennett, 2020).

Returning to Hanna's seminal (1983/1988) work, there is a distinctly American perspective articulated that connects somatic practice/learning to freedom. We include this perspective because it relates to pedagogical approaches, which can either tilt toward authoritarian and teacher-led or dialogic and student-centred methods (Rimmer-Piekaryczyck, 2018). Hanna's (1988) opinion was that one cannot truly be free if you don't have the ability to sense and affect

your own physiology (we note that this matches well with the discipline of kinesiology). It follows naturally that somatic training resists "outdated" authoritarian ways of teaching/learning, resulting in a more personally authentic experience for the mover, who is transferred some responsibility for their learning (Fortin, 2017; George, 2020; Green, 1999; Rimmer-Piekarczyk, 2018). Fortin (2017) has likewise discussed how somatic practice can be undertaken as a way to empower and generate individual agency for a learner/mover. Teaching from a somatic perspective, by focusing on inner sensory awareness and proprioceptive sensing, can bring students into the learning process, allowing them to experience how they can generate knowledge about and through their own bodies. This approach aligns directly with the learning outcomes in our kinesiology course as well as activities done in movement labs. We often encouraged students to make their own decisions about modifying movements according to physical sensations they may experience on any given day, giving them the freedom to guide their own bodies. For example, if they sense stiffness in their hip flexors during femoral flexion (see Calais-Germain, 2004, p. 140) they may choose to alter the squatting position we use in labs, thus incorporating the feedback they receive from their bodies. In researching the proprioceptive sensing aspect of our somatic approach, we saw significant overlap in the literature between descriptions of somatic learning and proprioceptive learning. For example, Tsakiris et al's (2006) study describes proprioceptive learning as the conscious experience of the location of a targeted body part in space, for example, an arm moving over the head in a lateral side stretch. Rather than using visual feedback from a mirror, we typically encourage students to become aware of proprioceptive sensing, such as the position of the feet aligning with (or not) the knees on a jump landing (see Calais-Germain, 2004, p. 190).

Empowering students to learn using their own bodies is a prevailing theme in several scholars' somatic research. Green's (1999) influential study explaining how power relations in the dance studio can produce "docile" bodies draws on the writings of earlier somatic theorists such as Don Johnson (1992) and Elizabeth Behnke (1990). These three scholars have addressed the deficit of bodily authority that can be common in dance and high-performance movement training contexts commonly studied in kinesiology. These scholars

have further demonstrated how our bodies are shaped by the cultures in which we live, and they at times situate their explanations of somatic learning in a socio-cultural milieu. Our approach is situated in a physical education context dominated by movement learning rather than considerations of cultural influence; however, it is relevant to our study to consider how somatic approaches can foster a sense of bodily authority and freedom in making decisions about one's bodily practices. For example, in our movement labs, we have students do an exercise to sense the alignment of the spine while holding a plank position; they are instructed to decide for themselves when to stop the exercise due to muscle fatigue.

Fortin's (2017) work outlines five pathways taken by somatic practitioners: social, ecological, spiritual, health and well-being, and educational. In our (kinesiology) setting, we have adopted somatic learning in a physical education context, as the outcomes of our course were to develop the mind-body connection through practicing optimal movement fundamentals. Thus, in our course, we do not prioritize a critical pedagogical, spiritual, or sociological approach to the moving body. Our approach aligns with what Fortin (2017) describes as educational, and health and well-being; for example, instead of relying on an app to tell us information about our bodies, we can teach students to develop their own bodily wisdom through their mind-body connection.

The opposite, a body-mind split, is addressed further in Johnson's (1992) and Green's (1999) work as they argue that Western cultures typically perpetuate the split of the body from the mind, subsequently separating us from our sensory selves. In addition to the body-mind split, Rimmer-Piekaryczyck (2018) adds that our cultural tendency is to value external authority rather than internal, first-person knowledge.

Many somatic scholars, notably Clark (2008) and Shapiro (2007, 2011) reject the separability of mind and body, arguing that for a human mind to exist, it must inhabit a human body, which moves in order to receive information and, thus, psychological processes are incomplete without the body's information. As we have encouraged our students along the pathway to internal authority and mind-body integration, we have compared this somatic practice to the develop-

ment of a kinesthetic sense (generally meaning a sense of movement occurring in the body).

We feel strongly that the body offers something more than isolated physical capabilities, as the physical self can also act as a repository of knowledge. We find the specificity of Freiler's (2008) description of somatic learning particularly applicable, as it indicates learning directly experienced through bodily awareness and sensation, during intentionally bodily-centered movement practices (such as Alexander Technique, Bartenieff fundamentals, Pilates and tai chi, described by Bennett, 2020). Therefore, in our movement labs, we have included many Bartenieff and Pilates-based exercises (see Black, 2022; Calais-Germain, 2004; Franklin, 2012; Hackney, 2002). In summarizing our approach, we can say the following: it reinforces a commitment to understanding foundational aspects of the natural body (precluding sport-specific movement as well as aesthetic and cultural implications) by learning that is experienced through bodily awareness, proprioceptive sensing, imagery and bodily-centered movement practices.

Ultimately, this practice grows an individual's kinesthetic awareness, which is directly tied to our learning outcomes. This approach also broadens the understanding of the body beyond definitions provided by the natural sciences where mind/body dualism dominates (Aartun et al., 2022; Bennett, 2020; Bresler, 2004; Evans et al, 2009). Rather, we hope that students will generate a somatic practice of their own, facilitating the application of movement fundamentals to any sporting, dance, or fitness setting. Next, we provide a brief review of student perspectives and the assessment of learning in kinesiology.

Assessing Student Perspectives of Learning

Several studies seeking student perspectives on kinesiology curricula focus on experiential learning (Coetzee et al., 2011; Coker & Porter, 2015; Coker et al., 2017; de Groot et al., 2015; Schultz et al., 2022) as they target community service learning in health promotion. In this literature, experiential learning is described as enabling students to bridge their learned skills and their professional lives after university (Kolb, 1984; Schenck & Cruickshank, 2015). While our course is also classified as an experiential learning course in our university system (typically divided into classroom or experiential

learning methods), for specificity, we use and refer exclusively to somatic learning (which is a category of experiential learning). Other experiential learning studies conducted in kinesiology departments, such as Rabattu et al. (2022), assessed the efficacy of embodied learning (movement-based anatomy learning) although it was done through official assessments (early, mid, and late semester examinations) rather than by collecting student perspectives. Although different from ours, these studies indicate that an approach combining movement-based anatomy learning with classroom learning was effective in raising test scores, and suggest it should be considered in kinesiology curricula.

These are the only other studies published about the effectiveness of non-classroom embodied and somatic learning in kinesiology, which we find somewhat peculiar given that kinesiology learning is defined by the study of the moving body. However, student perspectives have been collected for somatic learning in dance classes; Berg (2017) observed 18 hours of ballet training classes where the teacher used a somatic style rich with imagery. One of the comments she recorded from a student interview was that they were able to go "deeper" into their work, as well as noting through observations and other interviews that students had an increased ability to self-correct, had better internal authority and were working towards autonomy in their training practice.

We reiterate that our study differs from experiential/embodied learning studies in kinesiology and somatic learning studies in ballet in that we are seeking student perspectives of somatic learning in kinesiology. Furthermore, we used a large movement studio setting in our course, as opposed to community service learning or functional anatomy learning in the classroom.

In this study, we focus on student perspectives of somatic learning in one of our first-year courses: KIN 156, Introduction to Movement Fundamentals and the Mind-Body Connection (described in Noton, 2023). Although a few studies discuss an embodied approach to learning in kinesiology (Cherdieu et al., 2017; Dickson & Stephens, 2017; Yohannan et al., 2022), the approaches in the courses they investigate are limited to the use of short-duration hand gestures in classrooms or controlled laboratory settings. We, in contrast, are interested in the effectiveness of full body, somatic movement prac-

tices in studio/gym settings. Alone among these studies, Rabattu et al. (2022) did test the effectiveness of using full-body movements, albeit for a relatively short duration in a classroom setting, with their results supporting the use of movement in kinesiology learning. We further note that these studies investigated courses tasked primarily with learning functional anatomy, while our course's approach takes students through fundamental movements as a vehicle for understanding the mind-body connection (components of which were breath, imagery and proprioception). Although one result of our approach is an increased understanding of functional anatomy and biomechanics, this is not our primary learning outcome. Thus, our study is novel from others in two ways: the use of long duration full-body movements (via a somatic approach) and the use of a non-classroom environment (a large studio setting).

Study Design

Participants and Educational Context

Questionnaires were sent to 96 students who completed the course in either Fall (September-December) 2022 or Fall 2023, with 43 students responding. Although demographic data was not collected, all students were full-time undergraduate students at the time of the questionnaire; in Canada this population is typically between the ages of 18-25. All students were enrolled in a bachelor's degree of kinesiology program, where students can select from different minors corresponding with the subdisciplines of kinesiology.

In our first-year course, students participated in one 50-minute classroom lecture and two 50-minute movement labs in a studio setting per week, for 14 weeks (over one semester of study). There were 40-60 students in each movement lab with ample space for full-body locomotive movements in our large studio with floor-to- ceiling windows, barres, and sprung floors. Both authors instructed and moved with the students during movement labs, with the first author being the primary instructor. Although our course is coded as a 100-level (first year course), it is not restricted to first-year students, thus students at all levels of their bachelor's degree were enrolled. Over the semester, students were taught a repertoire of movement fundamentals, which included exercises to develop balance and postural alignment, target strengthening, stretching, proprioceptive aware-

ness, plyometrics, and breath (see Black, 2022; Calais-Germain, 2004; Franklin, 2012; Hackney, 2002). Imagery and visualization were used throughout all exercises as appropriate to the movement (see Franklin, 2012). Furthermore, all exercises incorporated biomechanically accurate movement patterns and anatomically accurate descriptions. Students were instructed with the goal of achieving an optimal physical quality of movement in each exercise, while simultaneously integrating breath, proprioceptive awareness and imagery-visualization to develop students' mind-body connection. During labs we typically played music at a low volume so that tempo could be easily followed for certain exercises and, thus, students could choose to work on flowing movement patterns where possible. While students learned movement practices as a group, they executed the majority of the movement practice on an individual basis. Although the movement experience level of our undergraduate students was mixed, all students were taught the same exercises but given options for modifying the movement according to their needs.

Methods

Previous studies (Cherdieu et al., 2017; Dickson & Stephens, 2015; Rabattu et al., 2022; Yohannan et al., 2022) had participant students complete formal examinations to test the effectiveness of embodied learning approaches; however, we felt this was not the best fit for our goal of investigating student perspectives. Our course did not use written examinations as a primary method of assessment that the students would be accustomed to, instead combining a significant participation component with short quizzes (15 min) and a final summative assignment. Additionally, we were not interested in the efficacy of somatic learning for the pure retention of anatomical and biomechanical knowledge. Thus, the way students were assessed in the course partially informed our choice of methods in this study for investigating student perspectives of somatic learning (straightforward likert-scale agree/disagree questions).

Questionnaires, using a 5-point Likert scale, were sent to two cohorts of students who had completed the course in either the Fall 2022 or Fall 2023 semesters. We created a questionnaire with an agree/disagree likert scale as we recognized that our students experience significant constraints on their free time, potentially impacting participation in our study (our questionnaire took 5-10 minutes to

complete). We designed our questions in accordance with methodological guidelines in Lee et al. (2002), Joshi et al. (2015), Jebb et al. (2021) and Croasmun and Ostrom (2011). Students were sent an email containing study information, a consent letter, and a link to the study, which could be completed online via our university's encrypted network and a web-based application. Students in the Fall 2022 cohort were, thus, contacted over one year after completing the course, whereas students in the Fall 2023 cohort were contacted weeks after finishing the course. Our hypotheses were that:

- In KIN 156, participants were exposed to novel topics that were not covered elsewhere in the kinesiology undergraduate curriculum.
- In KIN 156, participants were exposed to a new approach to learning about movement theory and practice not covered elsewhere in the kinesiology undergraduate curriculum.
- Participants valued their experience in KIN 156

Data Collection and Analysis

Questionnaire data was kept anonymized and no personal identifiers were collected when students submitted their responses. The questionnaire data was treated as a continuous data set, combining individual question scores to create a composite score. We used measures of central tendency and dispersion (mean + standard deviation) as well as an analysis of variation (ANOVA) to test among multiple questionnaire means and to determine which components, if any, significantly differed (Harpe, 2015).

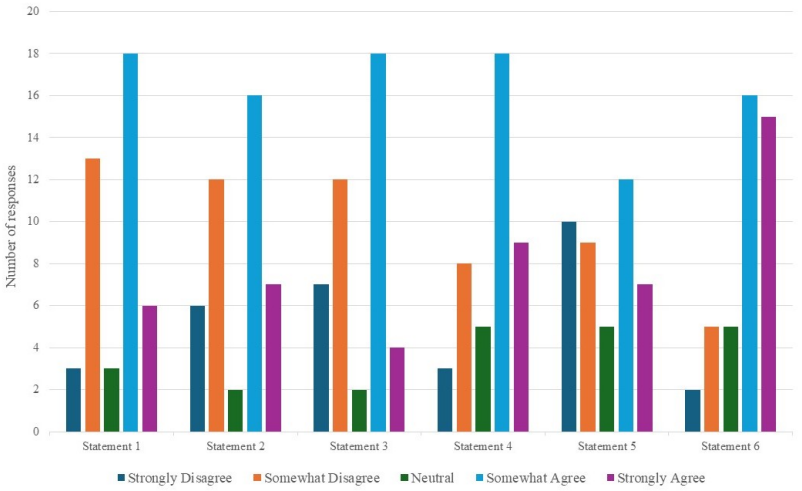
Results

We plotted the frequency distribution of responses to each category of questions: course content, course approach and perceived value of the course (Figures 1, 2, 3) as an initial attempt to describe our data (Delacre et al., 2019). As is evident from Figure 1, the distribution of answers to the first three statements about the uniqueness of the course content appear to be bimodal. While 56% disagreed with Statement 1 ("Before KIN 156, I had no familiarity with mind-body components") indicating many respondents were familiar with mind-body components prior to taking the course, 42% felt they had never been taught how to use the component of breathing during physical activity (Statement 2: "Before taking KIN 156, I had never

been taught how to use the component of breath when doing physical activity"). Forty-four percent agreed that they were not previously taught how to incorporate imagery-visualization during physical activity (Statement 3). However, responses to the final three statements on "course content" appeared to have slightly different distributions. Almost 63% of respondents felt that before taking KIN 156 they had not been taught how to use proprioception during physical activity (Statement 4). While students' responses to Statement 5 (Before taking KIN 156, I had never been taught how to stretch properly) showed an even distribution between those who agreed (44%) and those who disagreed (44%), responses to Statement 6 (Before taking KIN 156, I did not know what movement fundamentals were) elicited more somewhat (37%) and strongly agree (35%) responses than any other statements regarding course content.

Figure 1

Frequency Distribution of Answers to "Course Content" Statements

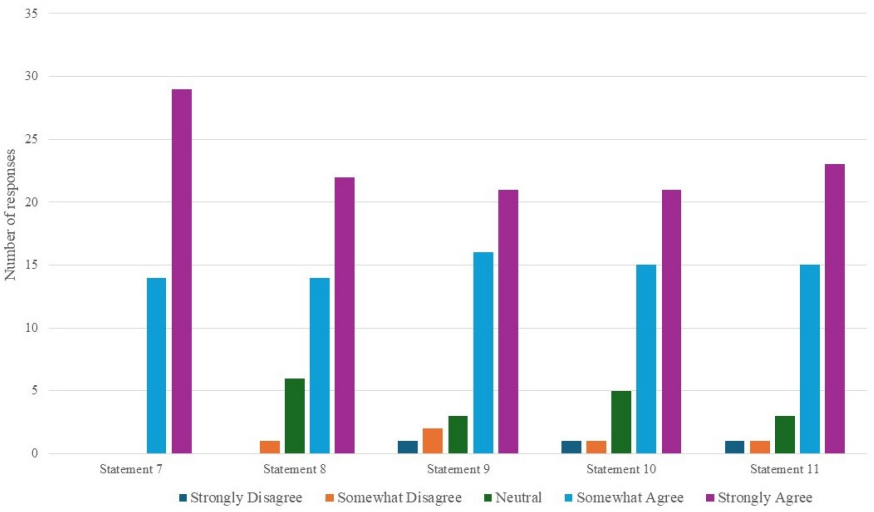


In Figure 2, we illustrated the distribution of responses regarding the uniqueness of the course approach (somatic learning). Unlike Figure 1, the responses to all questionnaire statements are heavily skewed toward somewhat and strongly agree, ranging from 84% (Statement 10: During KIN 156 movement labs I was better able to retain / remember biomechanical/anatomical knowledge through doing exercises in my own body) to 100% for Statement 7 (During

KIN 156, I felt better physically on days where we had movement labs). Eighty-four percent of respondents also noted that they felt psychologically better (Statement 8) on days with movement labs. Our somatic approach enhanced 86% of the respondents' understanding of biomechanical/anatomical knowledge through doing exercises in their own bodies (Statement 9) and enhanced the ability of 88% of respondents to apply mind-body connection concepts in their everyday lives (Statement 11).

Figure 2

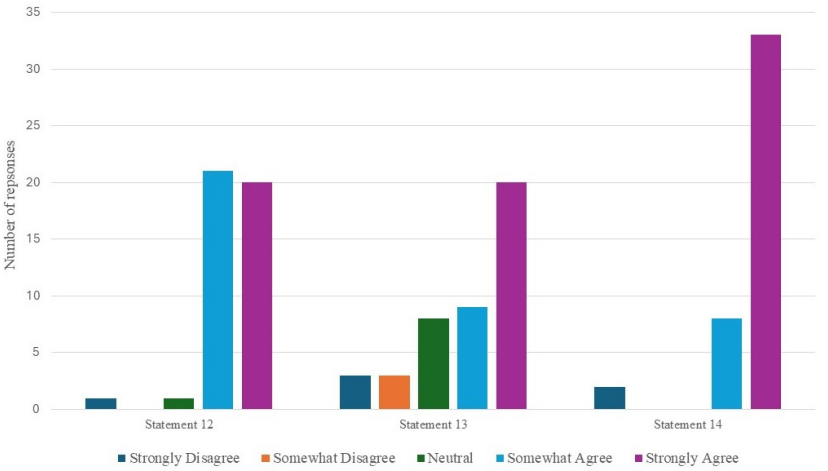
Frequency Distribution of Answers to "Course Approach" Statements (Somatic Learning)



Similar to Figure 2, Figure 3 showed distributions of responses skewed towards somewhat and strongly agree for all statements. While 67% of respondents agreed that the course should be mandatory for all students (Statement 13), overall, a clear majority (95%) felt that the experiential and somatic approach in KIN 156 was valuable as it enhanced their understanding of what the mind-body connection is (Statement 12) and how to retain and apply their learning (Statement 14).

Figure 3

Frequency Distribution of Answers to "Course Value" Statements



Because the responses were treated as a continuous data set, we chose to assess the variation among the responses. Given the skewed distribution of responses illustrated in the above figures, we used a Levene's test of normality of distribution and homogeneity of variance prior to statistical analysis (Gastwirth et al., 2009). This allowed us to determine if we should employ a one-way ANOVA or a Welch's ANOVA (Gastwirth et al., 2009). The Levene test showed that our data violated the assumptions of normal distribution and homogeneity of variance ($F = 49.7$, $p < 0.001$), therefore, we chose to employ a Welch's ANOVA to determine if significant differences existed among the three groups of responses (Delacre et al., 2019).

Table 1 summarized the average level of responses for each group of statements further illustrating the differences among the three groups. Welch's ANOVA showed a significant difference among the three groups of statements $F(2,332) = 62.72$, $p < 0.001$, thus, we used a post-hoc Games-Howell test, for use on parametric data sets with unequal '*n*' and variance, to determine if significant differences existed among the responses to different groups of questions (Shingala & Rajyaguru, 2015).The Games-Howell test showed significant differences existed between 'course content' and 'course approach' ($M = 1.089$, $SD = 0.1$) $p < 0.001$ and between 'course content' and 'perceived value of the course' ($M = 1.027$, $SD = 0.123$) $p < 0.001$.

No significant difference between "course approach" and "perceived value of the course" was found ($M = 0.062$, $SD = 0.107$), $p = 0.832$.

Table 1
Summary of General Statistics of Responses to Groups of Statements on KIN 156 Course Content, Approach, and Value. AVG = average Likert response per group. STD Deviation = measure of dispersion of Likert response per group.

Group of Statements	Sample Size (n)	AVG	STD Deviation
Content	258	3.28	1.33
Approach	215	4.37	0.84
Value	129	4.31	1.03

Discussion

In this study, our overall aim was to examine students' experiences of a somatic approach to learning in an undergraduate, first year kinesiology course. Interestingly, the distribution of responses with respect to course content significantly differed from course approach and course value, suggesting that course content was relatively familiar to the respondents. While not providing completely unique content, the impact of KIN 156 can be clearly seen through its pedagogical approach and perceived value. In this section, we start by outlining the effectiveness of using mind-body connection components as a way to combine theory with practice. Then, we consider how our somatic learning approach provided a 'missing link', teaching students how to understand, practice and apply concepts using their own bodies. Finally, we examine the value of somatic learning in the students' experience with KIN 156 and how it could be considered a 'missing piece' in kinesiology undergraduate curricula.

Course Content: Integrating Theory with Practice

In KIN 156, the instructor (first author) used mind-body components such as breathing, imagery-visualization and propriocep-

tion, while executing full-body movements, to practice functional anatomy and biomechanics. As is evident in Figure 1, course content was not experienced equally by all participants. As instructors, we were aware that students from all years of undergraduate study (first to fifth year) participated in the course. Although we did not collect personal data on what year each respondent was in when they took the course, it is possible that the bimodal distributions of statements 1-3 in Figure 1 may reflect the wide variety of kinesiology theory and concepts learned in different stages of students' degrees. While other researchers have begun to address this theory-practise gap using 3D interactive digital tools (Bauer et al., 2017; Hoang et al., 2017; Jain et al., 2017; Weyhe et al., 2018), such as projecting an augmented reality of a user's movement on a screen, these tools are ubiquitously expensive and require training to operate, thus, making them inaccessible to many students and faculties.

We know from conversations with the students during the movement labs that some of the participants had done dance and/or aesthetic sports as youth. Although we did not ask the respondents to share their movement background, given that many skills in dance and aesthetic sports require significant amounts of flexibility (e.g., Desfors, 2003), it was unsurprising that there was a distinct separation between those familiar with proper stretching techniques and those who were not.

While a lack of detailed demographic information may have limited our ability to parse possible relations between course content and age/level of education, movement experience and gender, we chose to retain student anonymity in an effort to maximize participation. Despite a lower than hoped for number of participants (50% of possible respondents), our main focus in this study was to examine the efficacy of our pedagogical approach in this new course. Thus, we now turn our attention to respondents' experiences of a somatic learning approach.

Course Approach: The Advantage of Somatic Learning

Understanding the students' experiences and perspectives, in addition to our own experiences as researcher-instructors, is a necessity as we continue to adjust course content and approach to meet the learning outcomes of these new activity courses. Most kinesiology students had some previous movement experience in dance,

sport, or various fitness modalities where bodily knowledge (e.g., body awareness, mind-body connection) was different from cognitive knowledge. Clearly, for the majority of respondents, the somatic approach furthered their conceptual understanding, retention and application of motor learning, biomechanics, anatomy, and qualitative movement analysis (see Figure 2, statements 9, 10, 11 and Figure 3, statement 12). Somatic learning, as a pedagogical approach, was an act of knowledge construction where awareness and action of the physical, social and cognitive self are incorporated (Fortin, 2017; George, 2020; Tsakiris et al., 2006). Therefore, our aim in employing somatic learning was to teach students how to understand, practice and apply kinesiology theory and concepts using their own bodies. While researchers such as Cherdieu et al. (2017) described executing forearm movements while watching a video about forearm anatomy as more effective than passive learning, our study incorporated larger, full body movements (e.g., locomotive and plyometric movements). Rabattu et al. (2022) described full-body movements (albeit for short duration in a classroom setting) as multiple segments or regions of the body moving in relation to each other. They suggested full-body movements were effective as these enabled students to recall spatial information between anatomical structures by feeling them move. This may be especially relevant for upper level (third and fourth year) students in applying and analyzing anatomy/ biomechanics. We underscored the value of full-body movement through the use of exercises designed to enhance students' cognitive and physical understanding of proprioception (e.g., sensing the position of the head relative to the spine in a balance exercise, or sensing the alignment of the chain of the leg on a jump landing).

Cherdieu et al.'s and Rabattu et al.'s studies also differ from ours in that they focused primarily on learning in a single kinesiology discipline (anatomy) whereas we employed a plethora of physiological and psychological theories to enhance anatomical and biomechanical understanding by using mind-body connection components (breath, imagery/visualization and proprioception/sensing).Furthermore, Rabattu et al.'s study took place in a classroom setting, as opposed to a studio or gym, thus restricting students' opportunities for learning through full-body movements. Because users tended to respond differently to each unique digital technology tool, Rabattu et al. (2022)

expressed doubt about the overall effectiveness of these digital technologies. By contrast, our results (Figure 2) showed that enabling kinesiology students of all levels to move their own bodies fully helped connect movement to theoretical knowledge. Our somatic approach in kinesiology is also supported by Dewey's (1997/1938) theory of sensorimotor learning, which notes that physical spaces offer the opportunity to reconnect the mind and body, potentially overcoming the limitations of traditional pedagogy, which support a body/mind split (Green, 2003; Nguyen & Larson, 2015).

Repetition and planning of somatic learning on a weekly basis was consequential in enhancing learning outcomes (understanding and application) compared to the use of sporadic and incidental inclusion of movements in a classroom setting (see Cherdieu et al, 2017; Rabattu et al, 2022). Perhaps our relatively frequent bouts of movement learning (twice a week over 14 weeks) impacted respondents' long-term retention. Previous studies have shown that theoretical and short-duration stationary anatomical learning were retained only for short periods (Cook et al, 2008; Masumoto et al, 2006). Considering that our respondents reflected on experiences that ranged from a few months or over a year in the past, clearly, our somatic learning approach had a significant impact. Somatic learning also provided much needed affective contexts, likely increasing students' engagement (Figure 2, statements 7 and 8) with the content and enabling them to realize more fully their potential as learners. From a teaching perspective, as the course progressed, students required fewer anatomical and biomechanical corrections as they became more aware of their own alignment, breathing, proprioception and ability to use imagery alongside movement. Evidently, our results illustrate that somatic learning can provide a 'missing link' to connect theory and practice in kinesiology. In short, learning through movement was perceived as a highly valuable component of the course.

Course Value: Somatic Learning as the "Missing Piece" in Undergraduate Kinesiology Curricula

As learning functional anatomy and biomechanics is a cornerstone of kinesiology learning, we recognized that it is important to address the learning tools currently in use. As instructors in kinesi-

ology, we found it highly concerning that, prior to taking KIN 156, 72% of the students, ranging from first to fifth (final) year, lacked knowledge of movement fundamentals (Figure 1, statement 6). This is essential to understanding not just anatomy and biomechanics, but how to apply the concepts these knowledges produce. For example, future kinesiologists, coaches, and physiologists may be required to use this type of knowledge through demonstration and explanation of functional exercises that they prescribe to their clients, athletes, and students (Kuklick & Mills, 2023). This suggests that traditional learning approaches in kinesiology may be failing undergraduate students in preparing them to use their knowledge of fundamental movement to correct postural misalignments and develop optimal functioning of clients and athletes' bodies in professional disciplines.

Of primary importance was the enhancement of respondents' retention, understanding and application of anatomy and biomechanics using mind-body practices. The emphasis the respondents placed on the value of their learning experience reinforced the efficacy of our pedagogical shift, where bodies can become sites of knowledge production (understanding, retention) and conduits for positive physical and psychological feelings (Bennett, 2020; Fortin, 2017; George, 2020; Green, 1999). Simply put, moving bodies became better thinking bodies. Our study reinforces the need to retain in-person learning opportunities in a post-COVID world, where sedentary practices and the associated diminishment in mental health continue to be prevalent as a way of cutting costs for underfunded kinesiology departments (Thomas, 2014). We, therefore, suggest that there is a strong need for courses like KIN 156 to employ somatic learning approaches that bridge the connection between theory and practice.

Conclusion

Through our study of student perspectives of somatic learning, we have an improved understanding of how we can combine theoretical knowledge from quantitative fields in kinesiology with real-life movement practice scenarios. We discovered that the course content was not entirely unique to a majority of students, instead, the impact of this course was seen through the students' positive

perspectives of our somatic approach. We were pleased that this type of approach functioned well, operationalizing theory and drawing together currently siloed streams of research in our faculty. Thus, by examining undergraduate student perspectives of learning, we have demonstrated the value of somatic knowledge and learning in the field of kinesiology, contributing to the integration of these two fields as suggested by Bennett (2020). Based on students' responses, it is clear that our somatic approach offered value for both students, us as instructors (better achievement of learning outcomes) and the field of kinesiology (enabling our graduates to combine theory and practice).

Although it wasn't the primary focus of our questionnaire topics, we also highlighted that 100% of students responded that they felt better physically on days where they had movement labs. A further 84% of respondents indicated that they also felt better psychologically on movement lab days. As universities grapple with how they can best support students during a time of increased mental health challenges, having data of students' perspectives is particularly meaningful and could be of use to policymakers.

As we consider future research of student perspectives in a similar third-year course, we underscore the results of two of our course approach statements: 86% of students indicated that our somatic approach enhanced their understanding of biomechanical/anatomical knowledge through doing exercises in their own bodies, and 88% indicated that it gave them the ability to immediately apply the mind-body connection components to their everyday lives. Clearly this approach is working for students and, thus, we suggest further research using qualitative methods to explore student perspectives of somatic learning.

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YOU AND THE LAW

Review of Key Golf Cart Cases 1980-99

Part 2[1]

Thomas H. Sawyer, Ed.D.

Introduction

Golf carts today are a necessity for golf courses. The days of walking the course have almost vanished. With the declining rounds played, golf course operators/owners need more and more of the revenue generated by golf carts. Golf carts come with liability, as will be seen in the review of the cases below. These cases are those that have been appealed, which is about 10% of all cases brought to lower courts for a resolution. The following are case summaries of court records of key golf cart cases related to golf course incidents, 1980-1999:[2]

[1]This is the second of a three-part series reviewing key golf cart cases between 1960 and 2016.

[2]The following articles and book were used as resources to gather the case summaries in this manuscript: Robert D. Lang, A Good Ride Spoiled: Legal Liability and Golf Carts, 23, *Marquette Sports Law Review*, 393; Michael Flynn, Cart 54, Where are you? The Liability of Golf Course Operators for Golf Cart Injuries, 14 *University of Miami Entertainment & Sports Law Review, 127* (1997); and Thomas H. Sawyer (2005), *Golf and The Law: A Practitioner's Guide to the Law and Golf Management,* Carolina Academic Press.

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Utz v. Powell, 288 S.E. 2d 601 (GA. Court of Appeals 1982)

While engaged in a golf game, appellant was struck by a motorized cart that was being operated by appellee. While engaged in a golf game, appellant was struck by a motorized cart that was being operated by appellee. Appellant subsequently caused to be filed an "Employer's First Report of Injury or Occupational Disease" with his employer's workers' compensation carrier. In describing in this report the general circumstances surrounding the incident for which compensation was being sought, appellant wrote: "On Savannah Inn golf course playing golf work related, with Employers factory representative." The workers' compensation carrier denied coverage, apparently on the basis that appellant's injury was not work-related.

Ryan v. Mill River Country Club, 510 A.2d 462 (Conn. App. Ct 1986)

The plaintiff, in this case, was injured when the golf cart she was driving went out of control as she traveled downhill on the cart path. The plaintiff presented evidence that the golf course owner knew the slope of the golf cart path in this particular area had caused previous accidents, but the owner did not take any action to correct the problem or to post any warning signs. In ruling for the plaintiff, the jury did not reduce the golf course owner's liability despite the plaintiff's testimony that she had played golf at the defendant's course for several years prior to the accident and knew of the severe slope of this portion of the cart path. The Court ruled in favor of the defendant.

Shaffner v. City of Riverview, 397 N.W.2d 835, 836 (Mich. Ct. App. 1986)

The plaintiff was a member of a foursome playing golf on the course owned by the City of Riverview. After they finished at the first hole, the foursome, in two golf carts, drove to the second tee. One golfer parked his cart about five feet behind the plaintiff's cart. While the plaintiff was standing behind his cart, the first golfer saw his cart start to roll forward towards the plaintiff. He entered the cart, applied what he believed to be the brake. Unfortunately, he actually hit the accelerator and the cart lunged forward, striking the plaintiff's cart and pinning the plaintiff between the two bumpers. This collision resulted in serious injuries to the plaintiffs. The jury

found both negligence and a breach of implied warranties on the part of the city and awarded damages totaling $163,200. The trial court found no indemnity as a matter of law. The court credited the city with the $46,000 settlement and awarded judgment in the amount of $117,200.

Fears v. McNamara, 574 So.2d 729 (Ala., 1990)

The plaintiff was struck by his own golf cart after the defendant moved the cart. The plaintiff parked the cart with its wheels turned to the right. When the defendant released the brake, the cart swung in the direction the wheels were turned and hit the plaintiff as he was approaching the cart. The evidence indicated that the plaintiff asked the defendant to move the cart, knowing he had left the cart with the wheels turned. The court ruled the defendant not liable for plaintiff's injuries.

Timm v. Indian Springs Recreation Assoc., 589 N.E.2d 988 (Ill. App. Ct. 1992)

The plaintiff was injured when she fell out of a golf cart that was missing its protective handrails. Plaintiff sued the golf course as the owner of the golf cart for failing to warn the plaintiff of the missing hand rail. The court instructed the jury that the golf cart owner did not have a duty to warn of the missing handrail unless the golf cart owner knew or should have known that a golfer might be injured if not warned of the missing handrail. The jury found for the defendant golf cart owner.

Gruhin v. City of Overland Park, 836 P.2d 1222, 1223 (Kan. Ct. App. 1992)

The plaintiff was injured while playing golf at a municipal golf course when the cart in which he was riding drove into a hole several feet deep. Golf club personnel knew that one other person had been injured at the same location several weeks before the plaintiff's accident and had marked the area around the hole with chalk lines. The golf course took no other steps to protect golfers from this dangerous condition on the course. The plaintiff presented evidence that the chalk lines around the hole were nearly imperceptible at the time he was injured. Although the municipality was exempt by statute for claims of ordinary negligence, which in this case were dismissed

at the trial level, the court held on appeal that the plaintiff's gross negligence claim would be submitted to the jury. Specifically, the court pointed out that the hole in question was located in the rough instead of on the fairways of the golf course and that it should not have been unforeseeable to golf club employees that golfers would be in the vicinity of this hazard. The evidence presented to the district court suggested that reasonable minds could differ as to whether the City employees displayed reckless disregard for a known danger.

Montes v. Hyland Hills Park, 849 P.2d. 852 (Colorado Court of Appeals, Div.1 1992)

\Plaintiff is injured while using a golf cart. Plaintiff alleged that he was injured on August 19, 1989, at a public golf course owned and operated by the district when the steering mechanism of a rented golf cart he was driving malfunctioned, causing the cart to veer into a ditch. Plaintiff further alleged that the malfunction resulted from the district's negligent failure to inspect, maintain, and repair the cart. Here, the alleged injury arose not from a dangerous condition of the surface of the golf course itself but from the alleged negligent maintenance of a golf cart. Thus, we conclude that the cart was not a "facility" within the meaning of § 24-10-106(1)(e) and that sovereign immunity was not waived for an injury caused by the negligent maintenance of a golf cart at a public golf course. Accordingly, the District was immune from liability, and the judgment entered upon the jury verdict cannot stand.

Zurowski v. Parker, Nos. 64907, 65321, 1994 WL 173658 (Ohio Ct. App. 1994)

The defendant was driving a golf cart that left the cart path and hit a tree. The court found that the defendant was using excessive speed while driving downhill and was not applying the brakes in a timely manner. The court held that such conduct was foreseeable and created an unreasonable risk of physical harm to the plaintiff passenger. The plaintiff successfully argued that the presumption of assuming the risk of participating in sports activities does not apply to golf cart accidents. Finally, the plaintiff successfully argued that since the defendant golf cart driver was acting within the scope of his employment (the purpose of the golf game was for the defendant and plaintiff to discuss a business deal between their respective

companies), the plaintiff was permitted to impute the defendant's liability to the defendant's employer under the doctrine of respondeat superior.

Montammy Golf Club v. Bruedan Corp., 620 N.Y.S.2d 153, 153 (App. Div. 1994)

Dorothy Koch was riding in a golf cart at Montammy Golf Club in Alpine, New Jersey, when her cart flipped over, injuring her. Koch and her husband sued Montammy and Bruedan Corporation, the company from which Montammy leased golf carts. The carrier for Bruedan disclaimed coverage, requiring the carrier for Montammy to defend. Following the settlement of the personal injury lawsuit, Montammy brought an action seeking indemnification from Bruedan and its carrier for the amounts Montammy paid in settlement and the cost of defense.

Holst v. Countryside Enterprises, Inc., 14 F.3d. 1319 (Tex. Court of Appeals, 5th 1994)

A golfer filed a negligence claim against a golf course for injuries sustained when a golf cart fell on him from an upper level of the club house. The Court determined that the golf cart was an instrumentality that caused the injury and not the entire clubhouse premises. Furthermore, the Court felt that the plaintiff failed to identify the golf cart and thus failed to establish that the operator of the clubhouse had exclusive control and management of the golf cart.

Monroe v. Grider, 884 S.W.2d 811(Tex. App.1994)

Monroe played in a golf scramble at McKinney Country Club. After the scramble was over, Monroe continued to play golf with several friends and Neal. Monroe rode with Neal in Grider's golf cart. At the fourth hole, Neal ran into Monroe as she stepped in front of the golf cart. Monroe fell and fractured her wrist. She also suffered a groin injury. The jury found Neal and Monroe were each 50% negligent in the accident. Monroe testified she relied on Neal's previous collision with Scotty Griffin in Grider's golf cart to support her negligent entrustment claim. Monroe admitted she had no personal knowledge that Neal was an incompetent driver. Pam Simmons testified Neal told her "he wrecked it [Grider's golf cart] or he hit something. I don't remember what he said. He said he rolled it or hit

it or something." Grider testified Neal told him that Neal intentionally bumped Scotty Griffin's golf cart to prevent it from tipping over. Grider testified Neal has driven Grider's golf cart on many occasions without incident. All witnesses testified they had never seen Neal drive a golf cart incompetently. The jury found Monroe and Neal each fifty-percent liable for Monroe's injuries. The trial court entered judgment against Neal on the jury's verdict

McDonald v. Grasso, 632 N.Y.S.2d 240, 240–41 (App. Div. 1995)

The plaintiff was playing golf at River Golf Club when she was hit by a golf cart. The plaintiff was standing behind her cart when a second golf cart stopped on an incline a few feet behind her. The driver of the second golf cart claimed that she brought the cart she was driving to a complete stop, pushed on the pedals to set the hill brake and got off the cart. After 20 seconds, the golf cart "suddenly rolled forward and pinned [the] plaintiff's legs between the two carts. The plaintiff argued that the second golfer was responsible for the accident due to her negligence in failing to properly set the hill brake. The plaintiff also sued the company that owned the golf cart and the golf club based upon the alleged failure of the hill brake to keep the cart from rolling on the incline. Court awarded a summary judgement to defendants.

Am. Golf. Corp. v. Manley, 473 S.E.2d 161, 163 (Ga. Ct. App. 1996)

The plaintiff and his brother were playing golf at the defendant's golf course for the first time. The 15th hole was particularly steep, and its cart path combined the particularly steep grade with a 180 degree hairpin turn. Due to heavy foliage and another curve, the hairpin turn was not visible to a cart driver starting down the hill. The plaintiff's golf cart crashed and tipped over at the hairpin turn. The manager of the golf course testified that management had considered putting in speed bumps to make the path on the [15th] hole less dangerous and had even thought about stationing a ranger there to lead drivers down the hill. However, course management decided not to do so, with the court noting that although the manager did not directly say so, the jury could have inferred from his testimony that the defendant did not want to spend the money because it had

decided to discontinue its operation of the course after its lease ran out. The trial court granted defendant's motion for directed verdict with respect to punitive damages, but allowed plaintiffs' claims for actual damages to go to trial.

DiMura v. City of Albany, 657 N.Y.S.2d 844, 845 (App. Div. 1997)

The plaintiff, after hitting his ball on the fairway at the fifth hole, the plaintiff returned to his golf cart, which was parked on the cart path, in order to drive to his playing partner's ball in the fairway. The golf course that day had a 90-degree rule in effect, which required the golf cart operator to minimize driving on the fairway by remaining on the path adjacent to the fairway until the cart reached a point ninety degrees from the ball, thereby protecting the golf course conditions. He, therefore, turned the steering wheel all the way to the right and accelerated. As he did so, he claimed the golf cart moved with a momentum that surprised him, causing him to lose his balance, fall off the golf cart, and sustain personal injuries. The plaintiff thereafter sued the E-Z-Go Division of Textron, Inc., the golf cart manufacturer, and other parties, alleging negligence, breach of warranty, and strict products liability. Supreme Court dismissed the cause of action alleging breach of warranty and that portion of the products liability claim alleging a manufacturing defect. The court denied the motion with respect to plaintiff's allegations of negligence, as well as design defect and failure to warn as they relate to products liability.

Donnelly v. Club Car, Inc., 724 So. 2d 25, 27 (Ala. Civ. App. 1998)

Donnelly was a passenger in a golf cart manufactured by Club Car. The upper half of the cart's plexiglass windshield was folded down. Apparently as the result of a gust of wind and a failure to secure the clips designed to hold the windshield folded in place, the upper half of the windshield flew up and struck the frame of the golf cart. The contact with the frame shattered the windshield, and a piece of the plexiglass struck Donnelly above the right eye. Expert witnesses for Club Car and Glen Lakes Country Club testified that plexiglass was an appropriate material for the windshield and that the accident would not have occurred had the 'hold down' clips been properly

secured. Blue Dot and Club Car filed motions for a summary judgment on August 23, 1995, and September 19, 1995, respectively. The trial court granted both motions on March 28, 1996, by entry on the case action summary sheet.

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