

Exploring How Sports Apps' Integration Degrees Affect Users' Attitude and Behavioural Habits Towards Physical Exercise

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Abstract

Sports apps play a substantial role in influencing users' attitudes and behavioural patterns as a result of their convenient nature, easy accessibility, social interaction features, and goal-setting capabilities, among other factors. The purpose of this study is to examine the utilisation of sports applications and their impact on individuals' attitudes and behavioural patterns in relation to sports. The research participants in this study are users of sports apps who are surveyed to investigate the impact of different levels of integration within sports apps' virtual communities on participants' attitudes and behavioural patterns. A total of 273 responses were gathered in order to conduct an analysis of the findings using quantitative data. The K-test and T-test were employed for this purpose, utilising the SPSS 26.0 software. The findings indicate that the level of integration of sports apps by users has a significant impact on their attitudes towards physical exercise and behavioural patterns. When the level of integration of sports apps is increased, users are likely to exhibit higher levels of physical activity and develop improved exercise habits across various dimensions. There is a suggestion that developers should enhance the content of sports and fitness applications while continuously striving to enhance their scientific rigour and accuracy. Furthermore, it is advisable for individuals engaging in physical exercise to actively utilise sports fitness applications and fully leverage the functionalities offered by these apps to enhance their fitness journey and cultivate a more optimistic mindset towards sports.

Keywords: Sport Apps, Virtual Community, Attitude of Physical Exercise, Integration Degree User's Attitude; Behavioural Habit.

Introduction

The proliferation of information technology, rapid transmission of electronic information resources, widespread use of smartphones, and exponential increase in information data have led to the widespread adoption of sports applications among individuals engaged in fitness activities, enabling them to monitor their physical exercise behaviours (Ben et al., 2022). The term "sports app" is a shortened form of "smartphone sports software," denoting applications designed for sports and fitness purposes that are installed on smartphones. These apps offer various features, including pedometer, mileage tracking, speed monitoring, energy expenditure estimation, and route logging (Qi & Cheng, 2022). The sports application not only encompasses the capability to record data, but also offers features such as friend interaction, participation in activities, sports organisation, and the provision of medals as rewards. This simulates real-life community engagements and establishes an online virtual community (Tu et al., 2019).

Several studies indicate that sports applications have the

potential to effectively aid individuals in engaging in sports activities. Sports applications frequently integrate goal setting, challenges, and reward systems, thereby enhancing users' motivation and adherence. Through the establishment of goals and the diligent monitoring of progress, individuals can cultivate a sense of accomplishment and sustain their motivation, thereby upholding their adherence to an exercise regimen. Certain sports applications incorporate social functionalities that enable users to share their training accomplishments, foster mutual motivation, and participate in interpersonal communication. This form of social interaction facilitates the development of a feeling of engagement and inclusion, establishing a cohesive community where individuals can receive affirmation and assistance.

Many apps incorporate the feature of providing immediate feedback and monitoring, facilitating users' comprehension of their exercise status and progress. This capability empowers individuals to adapt their training plans, accordingly, effectively managing and enhancing their overall well-being. This study aims to examine the psychological dimensions involved in the impact of sports

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applications and their underlying features on individuals' exercise behaviours and attitudes. The theory of use and satisfaction posits that individuals with distinct needs can be regarded as members of the audience, while their engagement with media activities can be seen as a process of utilising media to fulfil those needs. The primary focus of this research is to examine how the sports app caters to the inner needs of users and influences their attitudes and behaviour in relation to physical fitness.

This paper presents an analysis and processing of survey data collected from users of sports applications using SPSS 26.0. The objective of this study is to investigate the effects of different activities implemented in a mobile application on users' attitudes and behavioural patterns regarding physical exercise. Additionally, this research aims to determine whether the level of integration within a sports app has any influence on users' attitudes and behavioural habits towards physical exercise. The objective of this study is to propose a novel approach for enhancing the attitudes and behavioural patterns of the general population towards engaging in physical exercise.

Literature Review

Scholarly attention has been devoted to examining the influence of fitness apps on individuals' physical activity behaviour. Based on [Guo \(2022\)](#) research, mobile devices have been identified as a valuable tool for enhancing physical activity and fostering the development of motivational factors within the realm of sports. Furthermore, Guo's study also examined the influence of mobile devices on physical education. Moreover, the findings indicate that the utilisation of mobile applications yields favourable outcomes for the environment, extending beyond mere engagement in physical activity. These applications offer distinct advantages, including heightened motivation and potential for personal growth ([Aznar Díaz et al., 2019](#)). According to the study conducted by [Sarcona et al. \(2017\)](#), the utilisation of health applications has demonstrated a potential for positively influencing individuals' eating behaviour. The examination of fitness applications primarily centres around their role in educational settings, with a predominant use of experimental methodologies to investigate their impact on physical well-being. According to the findings of [Mollee et al. \(2017\)](#), a significant portion of the population fails to meet the recommended guidelines for physical activity, despite the widely acknowledged positive impact it has on health. Hence, it is imperative to implement efficacious and universally available interventions to enhance levels of physical activity.

The sports application contains diverse content. Previous scholarly investigations have exhibited a dearth of comprehensive examinations concerning the impacts of exercise applications on exercise behaviours and attitudes, particularly with regard to their precise content. Furthermore, it is imperative to explore the precise mechanisms that exert influence on exercise habits and attitudes towards exercise. The social cognitive theory places significant emphasis on the dynamic interplay between individuals and their social surroundings, as well as the cognitive processes involved in perceiving and making sense of information within the social context ([Schunk, 2012](#)). The present study aims to investigate the variations in participants' perceptions, attitudes, and behavioural intentions towards the virtual community associated with the exercise application. Additionally, the study seeks to examine the impact of these variations on individuals' attitudes towards physical activity and their behavioural habits.

[Cai et al. \(2022\)](#) conducted a study highlighting the significance of mobile applications in influencing individuals' attitudes and behaviours. Mobile applications are designed with the purpose of educating individuals for various purposes. However, the effectiveness of these applications is enhanced when users engage in social interactions with one another. [Valcarce-Torrente et al. \(2021\)](#) emphasised that individuals' behaviour can be impacted by engaging in physical exercise while utilising mobile applications that provide real-time data on health and behaviour. Hence, contemporary mobile applications have gained significant recognition among individuals owing to their ability to provide real-time activity tracking, as documented by [Chen et al. \(2020\)](#). According to a prior study, mobile applications have been identified as effective tools for motivating individuals and facilitating access to high-quality information. Moreover, a prior study have documented the noteworthy efficacy of mobile applications and their goal-oriented functionalities in facilitating behaviour modification among individuals. Positive perceptions of individuals regarding goal management are cultivated when reliable features are able to attain restricted access. In the study by [Lin et al. \(2020\)](#), the inclusion of reminders for exercise and other activities in mobile applications was identified as a valuable feature. Therefore, these applications serve a practical purpose in facilitating regular physical activities and enhancing user productivity through the provision of reminders.

The study conducted by [Burbach et al. \(2023\)](#) provided evidence to support the assertion that mobile applications possess strong tracking capabilities that can be relied upon for the effectiveness of their features. The application stores

the activities of its users, thereby enhancing the provision of more comprehensive information to them. According to [Perez-Aranda et al. \(2021\)](#), the utilisation of real-time tracking contributes to the attainment of application objectives while concurrently enhancing the user experience. Once users become familiar and proficient with the application, they tend to develop a more favourable and constructive mindset, which contributes to enhancing the functionality and effectiveness of the applications. In the work of [Perez-Aranda et al. \(2023\)](#), the efficacy of regular exercise can be enhanced through the use of a mobile application.

According to the findings of [Yu et al. \(2020\)](#), numerous users encounter difficulties when utilising exercise applications due to the presence of software bugs. The presence of bugs in the applications is of utmost importance as it significantly influences users' decisions to delete said applications. It is imperative for users of any application to be incentivized to enhance their learning behaviour through the utilisation of said apps ([Damberg, 2022](#)). The individuals utilising exercise applications are also engaged in cognitive processes related to the application interface, thereby directly influencing their comprehension and usability. Based on the findings of [Wang et al. \(2022\)](#), individuals who possess a less positive attitude towards applications tend to exhibit lower levels of expertise in their usage. This observation contributes to a deeper comprehension of the relationship between attitude and proficiency in application utilisation. According to [Ben et al. \(2022\)](#), the utilisation of exercise applications has been advocated for the cultivation of exercise routines.

[Vinnikova et al. \(2020\)](#) highlighted the significant educational function of mobile applications. These applications have demonstrated significant efficacy in shaping individuals' behaviour within the realm of education. A considerable number of users express contentment with the utilisation of these applications, perceiving them as influential in shaping their behaviour ([Marchant et al., 2021](#)). The activities executed on these applications are documented in the dataset. Hence, the utilisation of artificial intelligence in programming holds the potential to enhance cognitive capabilities and user satisfaction, thereby facilitating the advancement of application usage ([Barbosa et al., 2021](#)). Undoubtedly, these applications are making significant strides in enhancing the user experience. However, their usability can be further improved by ensuring reliable functionality, as suggested by [Li \(2023\)](#).

In words of [Ningning and Wenguang \(2023\)](#), it was emphasised that mobile applications possess a high degree of user-friendliness. The primary objective of these

applications is to incentivize individuals to engage in productive activities. [Zhuo \(2022\)](#) emphasised the feasibility of engaging in home-based workouts through the utilisation of applications that facilitate the provision of comprehensive exercise plans. However, [Dias et al. \(2022\)](#) have highlighted the significance of the readability and utility of such applications as crucial elements in promoting health behaviour. In the work of [Palos-Sanchez et al. \(2021\)](#), the utilisation of applications has been observed to induce a shift in users' attitudes, leading to increased motivation to engage with the technology. Hence, the implementation of user-friendly programming in these applications is imperative in order to construct a sophisticated framework for enhancing the user experience.

In their study, [Oc and Plangger \(2022\)](#) provided evidence supporting the significance of personalisation in driving the progress of applications and their effectiveness in facilitating user-friendly experiences. The optimal utilisation of applications is the most advantageous aspect of personalization. As stated by [Luo and He \(2021\)](#), the inclusion of personalisation as a feature in an application allows for the customization of settings, resulting in an improved user interface. In addition, the implementation of personalisation is of utmost importance as it has the potential to enhance the user's experience by catering to their individual needs, preferences, and comprehension when utilising the application. Hence, it is imperative that sports applications are designed with a user-friendly interface in order to effectively foster critical understanding among users.

Methodology

Subject

Between the months of October 2022 and December 2022, a total of 305 individuals utilising the virtual sports application were chosen as respondents in a random and anonymous manner. The survey instrument utilised a Likert scale as its foundation. The Physical Activity Attitude Questionnaire comprises eight dimensions, namely behavioural attitude, target attitude, behavioural perception, emotional experience, behavioural control sense, subjective criteria, behavioural intentions, and behavioural habits. The data was obtained through an online survey, resulting in a total of 273 questionnaires being returned, indicating a response rate of 89.5%. The rate of effectiveness observed was 95.2%.

Statistical Methods

The statistical software SPSS 26.0 was used for data analysis

in this study. Initially, the questionnaire underwent processing in order to derive the scores for each dimension of the physical activity scale. Subsequently, the Kolmogorov-Smirnov test (referred to as the K-S test) was used to examine the normal distribution of scores within each group. The T-test was employed to assess the two-sample hypothesis regarding the identical dimensional scores of the data.

Experimental Method and Data Classification

The present study aimed to assess individuals' attitudes and behavioural patterns towards physical exercise by employing the "Exercise Attitude Scale" devised by Oppenheim (1982). In addition, the comparative analysis of the frequency of each function of the sports app was conducted using the Delphi method. Three additional indicators were selected, namely, "number of medals" (Ben et al., 2022), "number of online sports activities," (Valcarce-Torrente et al., 2021) and "frequency of giving likes" (Lin et al., 2019). The three additional indicators questionnaire were added to the "Physical Exercise Attitude Scale".

Number of Medals

A medal is a form of recognition granted to users who successfully attain a specific objective on the sports application platform. A wide range of medals can be identified, including those awarded for exercise intensity, exercise frequency, exercise continuity, and holiday participation, among others. The primary purpose of this feature is to incentivize and motivate users to engage in physical activity in order to obtain additional rewards. Hence, the quantification of medals serves as a significant metric for assessing the extent of users' integration within the sports application community. A total of 134 participants in the survey, who can be classified as primary users of sports apps, selected the response option "less than 10" for this particular item. Therefore, the questionnaires with "more than 10 medals" were combined as "more medals group". Therefore, there are two groups, namely the "more medals group" (more than 10) and the "less medals group" (less than 10).

Participation Times of Online Sports Activities

Online sports activity plays a significant role within the sports app platform, serving as a simulation of offline competitions. Online sports activities can be categorised into three distinct types: regular and quantitative, non-regular and quantitative, and regular and non-quantitative. Upon achieving victory in an online sports activity, participants have the opportunity to receive rankings or medals, thereby experiencing a sense of

satisfaction or triumph. Hence, the level of engagement in online sports activities serves as a significant measure of the extent to which a sports application has been integrated. Based on the initial statistical analysis of the questionnaire, it was observed that approximately 52% of the respondents selected the option "never participated". Consequently, the participants were categorised into two distinct groups based on their levels of engagement: the "participated group" and the "no participation group".

Frequency of Giving likes

The act of providing likes serves as a means of expressing attention and admiration towards the athletic updates shared by friends on sports applications while also functioning as a mechanism for online communication with acquaintances. By engaging in frequent acts of social validation, individuals can experience a sense of reward and satisfaction through the mutual exchange of compliments and positive feedback. The act of providing likes serves as a means to enhance the emotional engagement within the virtual community of the sports application. Hence, the demonstration of altruistic behaviour can serve as an indicator of one's level of integration within the application's community. Based on the statistical data pertaining to this inquiry, it was found that 35% of the respondents selected the option "never liked". A majority of respondents, specifically 62%, indicated a preference for the option labelled "occasionally liked," whereas a significantly smaller proportion of individuals selected the option labelled "often liked." Consequently, the participants were allocated into two distinct groups, namely the "giving like" groups and the "no giving like" groups.

Results and Analysis

The scores of all dimensions, with the exception of "subjective criteria," exhibited higher values in the group with a greater number of medals compared to the group with a lesser number of medals, as illustrated in Table 1. The Kolmogorov-Smirnov test indicated that the scores for "behavioural cognitions," "emotional experience," "subjective criterion," "behavioural intention," and "behavioural habits" followed a normal distribution. Hence, the viability of these indicators can be assessed through the application of double-sample hypothesis testing. The outcome is displayed in Table 2.

The findings from the t-test analysis presented in Table 2 indicate a statistically significant distinction ($P < 0.001$) across the five dimensions of "behavioural cognition," "emotional experience," "subjective standard,"

"behavioural intention," and "behavioural habit." There are multiple indications. Firstly, with regard to the attitude towards physical exercise, the group that achieved more medals exhibited a higher level of autonomy in their exercise behaviour, with less influence from their social environment. The presence of additional medals enhances the physical and mental aspects of engaging in physical

exercise, thereby augmenting the depth and richness of the overall experience. Moreover, the inclusion of more medals intensifies individuals' motivation and eagerness to actively participate in exercise. In relation to behavioural performance, the physical exercise behaviour exhibited by the group with a higher number of medals was found to be more habitual in nature.

Table 1

Score And K-S Test of Physical Exercise Attitude-Behavior in the More Medals Group and Less Medals Group

Group	Indicator	Behavioural attitude	Target Attitude	Behavioural Perception	Emotional Experience	Behavioural Control Sense	Subjective criteria	Behavioural Intentions	Behavioural habits
More medals group	X±S	30.45±4.23	51.68±5.89	31.38±4.23	40.56±4.38	29.16±4.56	17.30±5.46	29.60±3.35	40.24±5.33
	P (K-S test)	0.03	0.04	0.05	0.34	0.35	0.49	0.49	0.57
Less medals group	X±S	26.34±5.04	43.23±4.38	28.56±2.45	36.89±5.33	22.35±4.37	19.82±4.35	25.36±3.80	33.69±4.74
	P (K-S test)	0.35	0.44	0.48	0.49	0.03	0.17	0.15	0.45

Table 2

Hypothesis testing results of Physical Exercise Attitude-Behaviour in the more medals group and less medals group

Hypothesis Test	Behavioural Perception	Emotional Experience	Subjective Criteria	Behavioural Intentions	Behavioural Habits
P (t-test)	0.001	0.001	0.004	0.002	0.000

According to the data presented in Table 3, it can be observed that the scores for all dimensions, with the exception of "subjective criteria", were comparatively higher in the participant group as compared to the non-participant group. The scores for the six dimensions, namely

"behavioural attitude," "target attitude," "behavioural cognition," "emotional experience," "subjective criteria," and "behavioural habit," exhibited a normal distribution in both groups. The hypothesis test can be performed, and the subsequent outcomes are as follows.

Table 3

Scores And K-S Test of Physical Exercise Attitude-Behaviour in The Online Sports Activity Participation Group and Non-Participation Group

Group	Indicator	Behavioural attitude	Target Attitude	Behavioural Perception	Emotional Experience	Behavioural Control Sense	Subjective criteria	Behavioural Intentions	Behavioral habits
Participation group	X±S	31.54±4.65	50.82±6.02	31.38±4.23	40.83±4.65	29.65±4.95	18.31±5.23	28.65±3.68	38.95±5.36
	P (K-S test)	0.25	0.07	0.42	0.47	0.28	0.49	0.09	0.21
Non-Participation group	X±S	28.43±5.33	47.36±6.12	27.38±2.93	36.87±5.24	22.07±4.17	19.78±4.42	25.26±3.44	33.35±5.74
	P (K-S test)	0.5	0.5	0.11	0.03	0.12	0.17	0.04	0.51

As shown in Table 4, there were highly significant differences in the five dimensions of "behavioural attitude", "target

attitude", "emotional experience", "Subjective criteria", and "behavioural habits" between the two groups ($P < 0.001$) and

“subjective standard” ($P < 0.001$). The difference in the

“subjective criteria” was highly significant ($P < 0.001$).

Table 4

Hypothesis Testing Results of Physical Exercise Attitude-Behaviour in the Online Sports Activity Participation Group and Non-Participation Group

Hypothesis Test	Behavioural attitude	Target Attitude	Emotional Experience	Subjective criteria	Behavioural habits
P (t-test)	0.001	0.001	0	0.008	0

The online physical activity group demonstrated a greater level of accuracy in their perceptions regarding the role and outcomes of physical exercise, as well as a clearer understanding of their objectives related to physical exercise. The impact of the surrounding environment has a diminished influence on it. Regarding behavioural performance, the level of habituation towards physical exercise behaviour was found to be higher in the group of participants, indicating a greater inclination towards engaging in physical exercise.

Table 5 shows that the scores of all dimensions except “subjective criteria” were higher in the giving-like group than in the no-giving-like group. The K-S test showed that the scores of “behavioural attitudes”, “goal attitude”, “behavioural cognition”, and “physical activity” were higher in the two groups. The scores of the six dimensions of “behavioural attitude”, “goal attitude”, “behavioural cognition”, “emotional experience”, “sense of control”, and “behavioral habits” of the two groups obeyed normal distribution, and the hypothesis test can be conducted.

Table 5

Scores And K-S Test of Physical Exercise Attitude-Behaviour in The Giving Like Group and No Giving Like Group

Group	Indicator	Behavioural attitude	Target Attitude	Behavioural Perception	Emotional Experience	Behavioural Control Sense	Subjective criteria	Behavioural Intentions	Behavioral habits
Giving like group	X±S	31.48±4.23	50.23±5.92	29.43±4.12	39.21±4.23	26.35±4.56	18.31±5.23	28.35±4.24	38.95±5.36
	P (K-S test)	0.15	0.29	0.49	0.32	0.07	0.49	0.12	0.11
No giving like group	X±S	28.43±5.33	46.36±6.12	28.38±2.93	36.87±5.24	21.07±4.17	19.78±4.42	24.26±3.44	33.35±5.03
	P (K-S test)	0.5	0.5	0.4	0.49	0.18	0.5	0.04	0.51

The results of the t-test in Table 6 show that the difference between the two groups was highly significant in the six dimensions of “behavioural attitude”, “target attitude”,

“behavioural perception”, “emotional experience”, “behavioural control”, and “behavioural habits” ($P < 0.001$).

Table 6

Hypothesis Testing Results of Physical Exercise Attitude-Behavior in the Giving Like Group and No Giving Like Group

Hypothesis Test	Behavioural attitude	Target Attitude	Emotional Experience	Subjective criteria	Behavioural habits
P (t-test)	0.001	0.001	0	0.008	0

Regarding attitudes towards physical exercise, the giving-like group demonstrated superior accuracy in perceiving the effects and outcomes of physical exercise, as well as possessing clearer objectives for engaging in physical exercise. Additionally, they exhibited greater autonomy in controlling their exercise behaviour, experienced more profound and diverse emotional responses to exercise, and held more favourable perceptions of physical exercise. The group characterised by prosocial behaviour exhibited a greater prevalence of exercise habits in relation to

behavioural performance. In brief, the varying degrees of integration within the application-based virtual community have a notable impact on the attitudes and behaviours of users in relation to engaging in physical exercise. Individuals who exhibit greater levels of engagement with each index demonstrate a more precise understanding of the functions and outcomes of physical exercise, a heightened determination towards engaging in exercise, and a more pronounced adherence to exercise routines.

The criteria of “deep integrating users” were “more than 10 medals”, “participating in online sports activities”, and “giving like”. “No online sports activities” and “no giving likes” were used as the criteria for “shallow integrating users”. According to the data presented in Table 7, it can be observed that with the exception of the “subjective criterion”, the scores for all dimensions in the group of deep integrating users were higher compared to those in

the group of shallows integrating users. The results of the Kolmogorov-Smirnov (K-S) test indicated that the scores for six dimensions, namely “behavioural attitude,” “target attitude,” “emotional experience,” “behavioural control,” “behavioural intention,” and “behavioural habits,” in both groups followed a normal distribution. The hypothesis test can be performed.

Table 7

Scores And K-S Test of Physical Exercise Attitude-Behaviour in the Deep Integrating Users and Shallow Integrating Users

Group	Indicator	Behavioural attitude	Target Attitude	Behavioural Perception	Emotional Experience	Behavioural Control Sense	Subjective criteria	Behavioural Intentions	Behavioral habits
Deep Integrating Users	X±S	33.36±4.13	51.23±6.04	30.43±3.22	41.21±4.17	28.23±5.56	17.31±5.57	29.26±3.24	39.95±5.23
	P (K-S test)	0.05	0.07	0.04	0.32	0.48	0.49	0.27	0.24
Shallow Integrating Users	X±S	28.43±5.23	46.63±6.78	28.38±2.87	35.83±5.24	21.76±4.04	19.56±3.92	24.56±2.87	33.65±5.28
	P (K-S test)	0.5	0.5	0.16	0.49	0.37	0.02	0.48	0.51

The results of the t-test in Table 8 show that there is a significant difference in the aspects of “behavioural attitude”, “target attitude”, “emotional experience”, “behavioural control sense”, “Behavioural Intentions”, and “Behavioural habits” ($P < 0.001$). This suggests that the deep-integrating users' group exhibits a more defined objective and attitude towards physical exercise when compared to other groups. The user group characterised by deep integration exhibits a more distinct inclination towards physical exercise, possessing well-defined objectives and a greater level of self-determination in regulating their exercise behaviours. As the level of

engagement in physical exercise increased, individuals reported a heightened emotional experience associated with their physical activity behaviour, characterised by greater depth and richness. The participants exhibited a higher level of behaviour evaluation and demonstrated a greater inclination to engage in exercise. The deeply integrated group exhibited a higher degree of exercise behaviour in relation to their behavioural performance. There exist qualitative distinctions between the two groups in relation to attitudes and behavioural patterns towards physical exercise.

Table 8

Hypothesis Testing Results of Physical Exercise Attitude-Behaviour in the Deep Integrating Users and Shallow Integrating Users

Hypothesis Test	Behavioural attitude	Target Attitude	Emotional Experience	Behavioural Control Sense	Behavioural Intentions	Behavioural habits
P (t-test)	0.001	0.001	0	0	0.001	0

The correlation between the frequency of usage and the utilisation of various features within the sports app platform suggests that participants gradually assimilate into the physical exercise activities facilitated by the app. As a result, there was a shift in the perception and conduct of engaging in physical exercise, leading to the development of positive sports ideologies and the establishment of consistent physical activity routines. Existing research indicates that there is a significant association between sports applications and physical

activity behaviour, suggesting that these platforms are effective in influencing individuals' engagement in physical activities (Fanning et al., 2012).

Discussion

The empirical evidence strongly supports the findings of this research. Nevertheless, the results of this research align with the findings of previous studies documented in the academic literature. Luo et al. (2021) demonstrated

the significance of personalisation in the advancement of programmes and its efficacy in facilitating user-friendly operations. The optimal utilisation of programmes represents the most advantageous aspect of rationalization. The necessity of customising an application's settings to enhance the user interface has been emphasised by [Marchant et al. \(2021\)](#). Furthermore, the incorporation of personalisation is crucial as it has the potential to augment users' understanding and inclination towards utilising the application. Hence, the provision of user-friendly software designed for athletic activities is imperative in order to influence the cognitive processes of users.

[Oc et al. \(2022\)](#) highlighted the significance of mobile applications in terms of their user-friendliness and their designated purpose as tools for fostering fitness motivation. [Ningning et al. \(2023\)](#) underscored the significance of utilising these programmes for the purpose of formulating a precise fitness regimen, thereby facilitating convenient home-based exercise. The significance of these programmes, in terms of their accessibility and effectiveness, was underscored as crucial factors in promoting health behaviour. The utilisation of applications has been observed to induce changes in users' attitudes as they feel compelled to engage with these applications ([Zhuo, 2022](#)). Therefore, the development of a sophisticated user experience model necessitates the implementation of programming techniques that prioritise user friendliness in the design of these applications.

According to [Barbosa et al. \(2021\)](#), mobile applications play a significant educational role. These applications demonstrate a high level of efficacy in modifying individuals' behaviour through educational means. A considerable number of users express satisfaction with the functionality of these applications, perceiving a significant influence on their behavioural patterns. The data collection presents an account of the actions that were undertaken on these applications ([Dias et al., 2022](#)). Artificial intelligence (AI)-based programming has the potential to enhance individuals' cognitive abilities and improve the user experience, thereby facilitating the advancement of application utilisation. These programmes are undeniably exerting significant efforts to enhance the user experience; however, achieving satisfactory performance from the users' perspective can enhance usability ([Palos-Sanchez et al., 2021](#)).

In words of [Kim \(2022\)](#), the presence of bugs in software can pose challenges for users attempting to utilise it for exercise purposes. The software is uninstalled by the users due to the presence of critical software defects. It is

advisable to promote a proactive approach among application users, encouraging them to modify their learning methods through the utilisation of said applications. The users of exercise programmes also take into consideration the application interface, as it directly affects their utilisation and understanding. According to the findings of [Cho et al. \(2020\)](#), individuals who exhibited a negative attitude towards the application were found to possess a lower level of experience in utilising it, thereby leading to a more comprehensive understanding of its functionalities.

The correlation between the frequency of usage and the utilisation of various features within the sports app platform suggests

In their study, [Gómez-Ruiz et al. \(2022\)](#) purportedly employed a fitness application as a means to foster a consistent exercise routine. [Yu et al. \(2021\)](#) demonstrated that the tracking capabilities of mobile applications are dependable in assessing the efficacy of their features. The programme stores and retains users' activities, thereby granting them access to enhanced information. The utilisation of real-time tracking facilitates the achievement of programme objectives and improves the overall user experience ([Vinnikova et al., 2020](#)). When users feel comfortable using an application, they tend to take a more proactive stance in enhancing the app's viability. The utilisation of a mobile application has the potential to augment the regular exercise regimen.

[Li \(2023\)](#) conducted a study that highlighted the significance of mobile applications in shaping individuals' attitudes and behaviours. While mobile applications are created with the intention of educating users for various objectives, their efficacy is enhanced through social engagement. [Hao et al. \(2023\)](#) underscored the potential impact of health and behaviour-oriented applications in shaping individuals' exercise behaviour through the provision of real-time information. The high value placed on contemporary mobile applications is attributed to their ability to monitor behaviour in real-time, as documented by [Gür et al. \(2020\)](#).

According to [Gu et al. \(2022\)](#), mobile applications are highly valued by consumers due to their ability to offer superior information. Furthermore, it has been disclosed that the utility and goal-oriented features of applications are significant in facilitating habit modification among individuals. When individuals have limited access that is facilitated by reliable attributes, their perception is improved in a positive manner for the purpose of goal management. As stated by [Li et al. \(2023\)](#), mobile applications possess the valuable attribute of providing

exercise and activity reminders. Hence, these applications serve as valuable tools for promoting consistent physical activity and productivity through the provision of timely reminders.

Conclusion

The utilisation of sports applications on mobile devices is prevalent in contemporary society. By conducting a comparative analysis of individual indicators and comprehensive indicators, it was observed that the level of integration of users of sports applications into virtual communities within the app resulted in variations in their attitudes and behavioural patterns towards physical exercise. By further integrating and implementing physical exercise practices, the emotional experience of exercise behaviours among app users would be enhanced and more comprehensive, leading to increased effectiveness of their exercise behaviours.

Additionally, individuals will exhibit enhanced clarity in their exercise objectives, more precise perceptions of exercise outcomes and functionalities, and a heightened inclination towards engaging in increased physical activity. This phenomenon results in an increased inclination to engage in physical activity, more regular exercise habits, and a heightened propensity for engaging in health-promoting behaviours. The results of this study indicate that it is possible for the general population to cultivate positive attitudes towards physical activity and establish consistent exercise behaviours. These findings offer a novel approach to enhancing the public's attitudes and behaviours related to physical exercise.

Implications and Future Directions

The findings of this research have significant implications both in terms of theory and practical applications. The study indicated that smartphone applications are effective in influencing users to engage in physical exercise. Undoubtedly, previous research has addressed this particular domain; however, no empirical findings have been documented thus far. Additionally, this study elucidated that the utilisation of smartphone applications for health purposes exhibits a direct and substantial impact on the users' attitudes. The impact of this influence on their attitude serves as a driving force for them to experience a sense of confidence in utilising these applications. The study findings indicate that the utilisation of smart applications can potentially lead to behavioural changes. Hence, the significance of utility is paramount for users to effectively employ these

applications in their respective operations. The research findings presented in this study contribute novel insights to the existing literature by offering empirical evidence on the concurrent impact of apps on users' attitudes and behaviour. This study has substantiated that the progress in application development is a prominent determinant that directly impacts users' perception and comprehension, as per the operational context.

This study has practical implications. The research findings highlight the significance of exercise applications in promoting user progress and development. The research indicated that enhancing the reliability of app development can potentially serve as a motivating factor for users to engage with and utilise the apps. Moreover, this study elucidated that the utility of these applications can constitute a substantial determinant for the users. The developers of the applications are obligated to enhance the technological advancements and augment the utility of the applications. Undoubtedly, the significance of utility is paramount in the advancement of applications. However, the presence of a user-friendly interface is a crucial element that contributes to the enhancement of app usability. Hence, it is imperative for the developers to enhance the compatibility of their applications for seamless functionality. The compatibility between different components enhances the user experience and offers a dependable avenue for enhancing the application's functionality by attracting a larger user base. In order to enhance the efficacy of these applications in facilitating users' workflows, it is imperative to incorporate a certain degree of adaptability. This adaptability would enable users to effectively utilise the applications, thereby promoting a reliable and efficient working environment that aligns with their specific needs and requirements.

The findings of this research are both significant and novel within the existing body of knowledge. However, it is suggested that future studies consider the following recommendations: Firstly, in terms of future research, it is imperative to investigate the influence of sports application usage on the physical activity habits and behaviours of distinct age cohorts, considering their varying requirements and acceptance levels of mobile devices. Furthermore, future studies should aim to identify areas for enhancement within these applications, with a focus on catering to the specific needs of diverse user groups. Furthermore, future research endeavours should focus on gathering qualitative data from participants in order to ascertain their perspectives on the efficacy of sports apps in shaping their attitudes and

behaviours. In order to obtain the most comprehensive responses from participants, future studies should employ a combination of interviews and structured

questionnaires. Therefore, future research endeavours are driven by the desire to validate the results of this study using a sample from a different geographical area.

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