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Article

BehaviourCoach: Exploring the Use of a Web-Based Serious Game in Health Promotion

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Abstract

Using a multidisciplinary approach, the current study examined the roles of psychological factors and serious games in the promotion of physical activity and wellbeing. The aim was to investigate the use and evaluation of a Web-based application named BehaviourCoach through the following research questions: How do users experience and evaluate this web-application for health promotion? How do elements of serious games and participants' health status relate to intention to use this web-application? Participants (N = 55) engaged with BehaviourCoach for a duration of 45 minutes. Physical activity, psychological wellbeing, user experience, evaluation and intention to use a digital tool for health as well as demographic information were self-reported. On average, participants were sufficiently active as a group to meet the guidelines of 150 minutes per week of activity. They also reported moderate psychological wellbeing. The evaluation of the web application was positive, with participants expressing enjoyment, reporting that they found the game to support social interaction, and that the web application interface's navigation was user-friendly. These factors were found to be positively related to intention to use the digital tool for health promotion in the future. In addition, participants' levels of overall health and subjective wellbeing were predictive of intention to use the web-application for quick results. The study's implications for e-health interventions are discussed, as well as future directions.

1. Introduction

The Covid-19 pandemic has propelled the United Nations Sustainable Development Goal (SDG 3): "Good health and wellbeing" to the forefront of most countries' agendas, emphasising the need to promote healthy lives and overall wellbeing worldwide [1]. It highlights the importance of considering and addressing both physical and mental health in our increasingly interconnected and digitalised world. Traditional health promotion strategies include individual and group face-to-face counseling, educational campaigns, public health sensitisation, and interventions. However, in light of major changes in society, such as the Covid-19 pandemic and rapid globalization, innovative approaches for health promotion are warranted. There is a need to research how digital applications and serious games can be used for the promotion of health and wellness.

The current research adopts a multidisciplinary approach encompassing areas of psychology, health promotion and digital technologies to further understand how serious games are perceived and used. The current research focuses on a) how users experience and evaluate a web-application for health promotion and b) how elements of serious games and participants' health status relate to intention to use a web-application in the short-term. In order to do so, a web-application named "BehaviourCoach" was developed and tailored to the research context for further testing. The next sections cover health promotion from psychological and digital technology perspectives, offering insights into the challenges and opportunities for improving public health and wellbeing. The web-application "BehaviourCoach" is also fully described.

2. Psychological Perspective on Health Promotion

The field of Health Psychology has generated a wealth of empirical knowledge to promote health, leveraging models such as the Health Belief Model [3], Theories of Reasoned Action/ Planned Behaviour [4], Social Cognitive Theory (Self-efficacy, [5]), and the Transtheoretical or Stages of Change Model [6]. These Health Behaviour theories predominantly focus on the person as individual entities. They postulate that various psychological factors including self-efficacy, attitudes, preparedness, and enjoyment, influence the adoption and maintenance of health-promoting behaviours [7].

It is also important to consider the role of social factors in health promotion, specifically how groups of individuals can influence other people to adopt behaviours for the betterment of health outcomes. Indeed, social groups play an important role in predicting behaviours [8] and this logic can be applied to a wide range of health domains. For example, people are more likely to give blood if donating blood is congruent with the way they identify [9], to engage in healthy eating and to adopt and continue an exercise program [10] if this health behaviour is an important part of one's sense of self. According to Social Identity Theory [11], individuals derive a sense of who they are from memberships in social groups and categories. Groups provide information on one's self concept and enable a better understanding of how one should think, feel, and behave through social norms, a set of rules that are socially agreed upon [12]. Accordingly, people are more likely to engage in health behaviours that are concurrent with one's group memberships, particularly if this group is an important and central part of one's identity [13]. Previous research [14] has shown that identifying with a beneficial social group correlates with self-confidence, stress coping abilities, adaptive coping strategies, and hence, better overall health. Social groups thus serve as vital psychological resources that can support people in maintaining good health.

More recent definitions of health emphasise its holistic nature, encompassing psychological wellbeing, low levels of distress, a combination of good physical and mental health, and subjective quality of life [15]. There is strong evidence that physical activity is associated with numerous health benefits such as the prevention of cardiovascular diseases, type II diabetes, cancer, hypertension, and obesity [16]. Moreover, the positive relationship between physical activity and mental health is well established. For example, physical activity is related to mental wellbeing and can be a preventive factor for depression [17]- [18]. Despite the evidence, a considerable portion of the population fails to engage in adequate physical activity to reap these health benefits.

3. Digital technologies perspective on Health Promotion

The Covid-19 pandemic has indisputably brought attention to the importance of good health and digital health solutions. The emergence of new technologies in the area of Information, Communication and Technology (ICT) has revolutionised the landscape of health interventions. For example, the use of smart devices in health behaviour change are often referred to as Digital Behaviour Change Interventions.

Smart devices, wearable trackers like Fitbit or Apple Watch, and accompanying applications have given rise to Digital Behaviour Change Interventions (DBCIs) [19] designed to promote healthy lifestyles [20]. To complement DBCIs, innovative strategies have merged health recommendations with gamification elements to further sustain motivation and maintain health of individuals [21]. Gamification, is defined as the use of "game design elements in non-game contexts" [22], such as physical activity promotion, prevention of mental illness and depression, and support for healthy lifestyles. In gamification, elements like points, badges, leaderboards, and rewards are integrated into non-game settings to make health-related activities more engaging and enjoyable. The effectiveness and benefits of gamification rely on the premise that it provides "a positive and meaningful game-based experience" to its users, which consequently leads to long-term engagement [23]. For example, some exergames are physically active video games that require players to engage in body movements or take actions in order to progress in the game. These have been effective in maintaining or increasing levels of physical activity. They also have been considered and applied for mental health interventions [24]. Moreover, web-based interventions are becoming increasingly popular as they have numerous benefits. They allow individuals to improve their health from the comfort of their homes, with or without the physical presence of a health care professional. Web-based interventions can also reduce the economic costs of providing health services while increasing access to care for large groups of individuals which might otherwise be unreachable due to physical or psychological barriers. Additionally, they are perceived as very convenient by people seeking healthcare services, offering flexibility in terms of time, physical environment and social environment, as well as anonymity, which can enhance support for treatment [25]-[26].

4. BehaviourCoach

The current study explores the development and deployment of serious games in promoting wellbeing. Serious games take the principles of gamification further by offering purpose-driven gaming experiences in non-entertainment contexts [27]. To create a digital tool that was culturally relevant and encouraged holistic health, a web-based application was developed for the purpose of this study, known as 'BehaviourCoach'. This application draws inspiration from the popular board-game, Monopoly® and was initially presented as a prototype in the year 2020

[28]. Since the application is not intended for public release or commercial use, we stand guided by the principles of fair practice under the Copyright Act 2014 of the Republic of Mauritius and no licence is necessary for scientific research purposes. BehaviourCoach's primary goal was to motivate participants to engage in physical activity and adopt healthy nutrition practices. BehaviourCoach comprised of a series of slots, each directing intervention participants to undertake specific activities linked to either a physical exercise or nutrition. The updated version of BehaviourCoach (2023) included a broader definition of wellbeing encompassing cardiovascular exercises, breathing techniques, stretching routines, relaxation exercises, and psychological wellness strategies.

As aforementioned, BehaviourCoach's digital board consists of a number of slots representing properties/places of interest (such as gyms, mountain tracks and trails, spas and wellness centers, nature parks) with names tailored to the local context. The board layout includes the "start" grid, two "education" corners, and a "bonus" corner, creating a familiar and engaging gaming experience as shown in Figure 1.

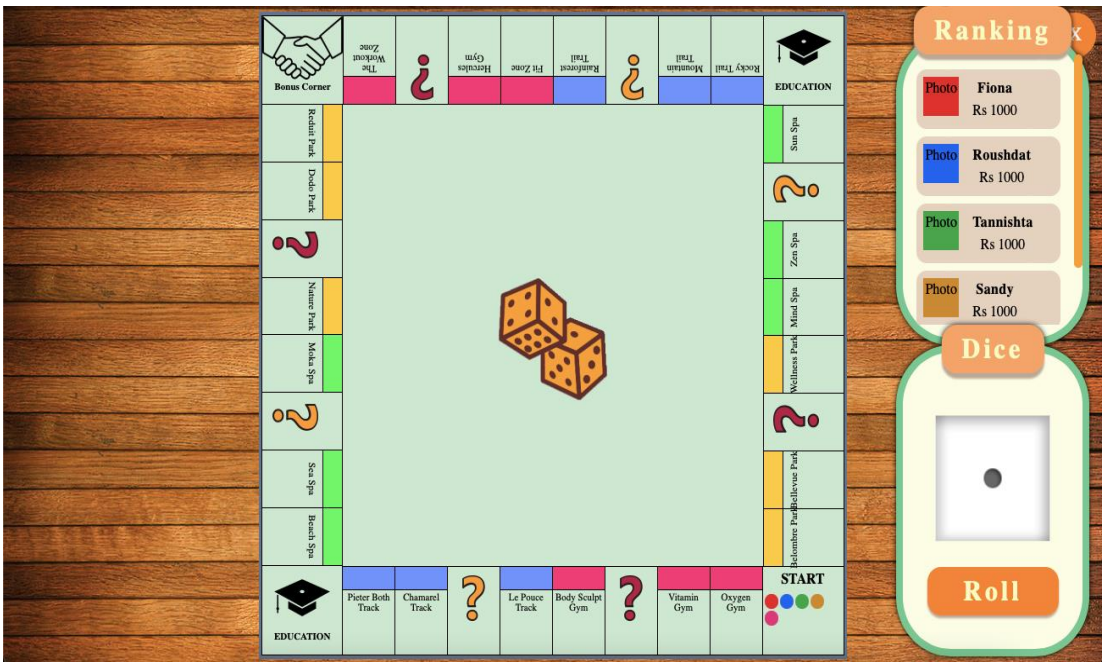

Figure 1. The "BehaviourCoach" Interface

Participants take turns rolling a digital dice and move accordingly to a slot on the digital board. Upon landing on a slot, a wellbeing activity is randomly presented to the participant. The list of wellbeing activities for the web application were developed to align with the cultural context of the country, last less than 3 minutes, and require no special equipment. There are 55 wellbeing activities categorized into four groups: 1. "Heart fit", involving cardiovascular exercises (e.g., jumping jacks, shuttle run); 2. "Breathing fit", focusing on breathing, stretching, and relaxation techniques (e.g., child pause, deep breathing); 3. "Mental fit", aimed at promoting psychological wellness (e.g., sending a caring message, trying something new); and 4. "Creative fit", encouraging participants to develop their creativity (e.g., writing a three-word story, drawing something that brings joy). Each activity is described by clear instructions and pictograms when necessary.

Upon successful completion of an activity, each participant earns fitness points which they can redeem to acquire/purchase properties (slots). Additionally, the application features "education" corners, providing valuable informative facts and knowledge on health and wellbeing. Gamification elements have been incorporated such as a leaderboard to track fitness

points earned through wellness activities, animations to showcase social interactions and progress, sound cues for indicating successful completion and progress, as well as pictorial representations of wellness activities (as shown in Figure 2). The BehaviourCoach application is accessible online at: https://behaviour-coach.onrender.com/

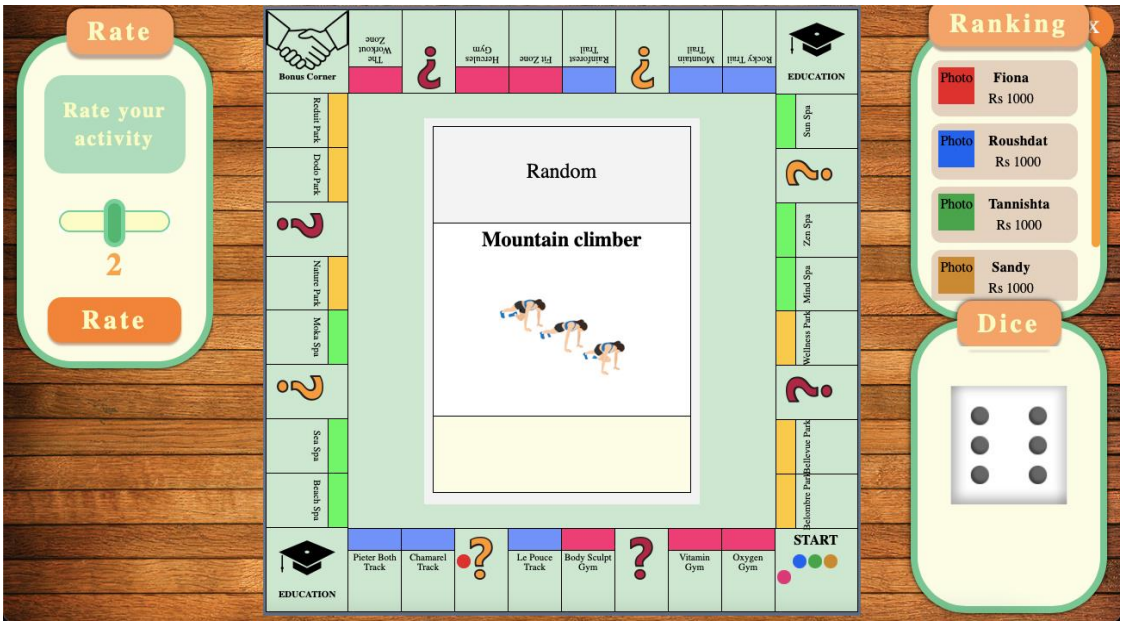

Figure 2: Web application and activities displayed in game

In sum, past research has shown that serious games present a number of advantages in the promotion of health, especially when they take into consideration psychological factors such as enjoyment, social connections, convenience, self-efficacy, engagement, and relatability to the social context. Little is known about the use of serious games for health promotion in developing countries. There is thus a need to develop web-applications that are tailored to the local context and, subsequently, identify factors related to intentions to use serious games for physical and mental health. The current research addressed this gap by asking: How do users experience and evaluate a web-application for health promotion? How do elements of serious games and participants' health status relate to intention to use a web-application?

5. Methods and Material

The current research adopted a collaborative and multidisciplinary approach to investigate the psychological and technological factors that promote health. This study examined a) the current state of physical and psychological wellbeing in the sample, b) user experience, evaluation, and intention to use a digital tool (BehaviourCoach) for health, and c) the interrelationships among key variables.

5.1 Participants

A total of fifty-five *(N=55)* adult participants were recruited through the following channels: email, publications on social media pages, and in-person interactions, to participate in the study. In terms of gender, 41.8% of the participants responded as male and 49.1% as female (9.1% of the participants preferred not to answer). The age range of participants spanned from 18 to 58 years, with a mean age of 24.90 years (*SD* = 9.58). Participants predominantly resided in rural areas (60%) as compared to urban areas (32.7%), with a minority opting not to specify

(7.3%). In terms of professional status, the majority identified as students (70.9%), followed by those who were employed (18.2%), unemployed (3.6%), and a few who chose not to disclose (7.3%). In terms of gym or fitness center membership, 52.7% reported not being members, 41.8% were members, and 5.5% selected "other".

5.2 Procedure

Participants were informed that the study was designed to explore their feelings toward wellbeing and entailed testing a web-based application named “BehaviourCoach”. They were assured of confidentiality and anonymity, and informed of their right to withdraw at any time. Once participants provided informed consent, they completed a brief pre-test questionnaire assessing: a) overall health, b) physical activity, c) barriers and motivation for physical activity. Following which, participants engaged with the web-application and played in groups of 4 to 8 players for a duration of 45 minutes. Following this interaction, participants completed a post-test questionnaire to report: a) user satisfaction, b) subjective wellbeing, c) evaluation and intention to use the web application. Demographic variables were also measured. This intervention was conducted either on campuses or gym centers with the active supervision of a research assistant who facilitated the use of the web application, answered questions, and ensured that the interaction with “BehaviourCoach” lasted 45 minutes. Once participants completed the survey, they were fully debriefed and thanked for their participation.

This research project was granted ethical clearance from the University of Mauritius - Research Ethics Committee, ensuring the protection of human participants (UoMREC52). Taking into account ethical considerations, participants provided written informed consent, were informed of their rights as participants (no harm, anonymous and confidential participation, the right to withdraw from the study), as well as receive a complete debriefing describing the study’s aims and objectives.

5.3 Measures

5.3.1 Pre-Test Measures

Overall Health. Three questions assessed participants’ self-reported health. The first question used a 7-point Likert scale and asked “How is your health in general?”, followed by the question “What is your overall wellness level?” (1 *very bad*, 7 *very good*). And thirdly, the question “Do you consider yourself as someone living with mental health issues, cancer, cardiovascular disease, chronic respiratory disease, none of the above, would rather not say?”. Participants were invited to tick conditions that applied. These questions were extracted from the Inner Wellbeing Questionnaire [29].

Physical Activity Behaviour. Two questions assessed participants’ usual weekly physical activity. Participants answered “how many days per week” and “how many minutes each time” of physical activity they usually engage in. The self-reported frequency of PA was multiplied by the duration in minutes resulting in the final measure of total number of minutes per week of PA. These questions were adapted from the Godin Leisure-time Exercise questionnaire [30].

Barriers and Motivation for Physical Activity. Two open-ended questions were used: “What are some of the reasons you do not participate in physical activity?” and “What are some of the reasons/things that would motivate you to participate in physical activity?” These items were derived from the Perceptions of Barriers and Motivators to Physical Activity Participation Questionnaire [31].

5.3.2 Post-Test Measures

User Experience. Ten items measured user experience and engagement using a 7-point Likert scale (*1 Strongly Disagree, 7 Strongly Agree*). Sample items are: "I find the game's interface to be easy to navigate", "I like to play this game with other players", "I can recommend this application to others". This questionnaire has been used in previous research and has been adapted from the Game User Experience Satisfaction Scale (GUESS) [32]. Each item is viewed individually.

Subjective Wellbeing. Participants reported their subjective wellbeing by answering 5 questions (α = .783) from the Subjective Wellbeing Assessment Scale [33]. Sample items are "All things considered, I feel reasonably happy", "I feel optimistic about the future", "I feel relaxed" (1 *strongly disagree*, 7 *strongly agree*). A mean subjective wellbeing score was computed.

Intention to Use Technology for Wellness. Two items derived from the mHealth Satisfaction Questionnaire [34] were used to assess intention to use the web application "BehaviourCoach" for wellness. The questions are "Using BehaviourCoach will enable me to take action related to my health more quickly", "I would be willing to use BehaviourCoach for my health and wellness" (1 *strongly disagree*, 7 *strongly agree*).

Demographic information, including gender, age, education level, residence, professional status, gym membership, height and weight, was also collected.

6. Results

6.1 Overall health and wellbeing

On average, participants reported their overall health to be good (M = 5.25, SD = 1.09). Indeed, 81.4% of participants reported that their overall health was moderate to good, whereas 19.6% of participants felt that they were in poor health. Among those, 7.3% revealed a chronic respiratory disease; 12.7% of participants disclosed mental health challenges; 7.3% of participants did not want to reveal their ailments; and 72.7% mentioned that the illnesses above did not correspond to their condition.

Participants reported a moderate level of wellbeing (M = 4.86, SD = 1.09), meaning that participants were not totally satisfied with their life, nor fully optimistic about the future.

6.2 Physical activity and Body Mass Index

On average, participants reported being physically active (PA) for 169.96 (SD = 158.39) minutes per week, thus being sufficiently active as a group to meet the World Health Organization (2023) guidelines of 150 minutes per week of activity. With a closer look, the minimum PA was zero minute per week and the maximum PA was 720 minutes per week. It is also important to note that 59.6% of participants reported exercising less than 150 minutes per week, thus living a somewhat sedentary lifestyle.

Forty-two participants shared their weight and height, thus allowing for the computation of the Body Mass Index (BMI). The BMI is "a person's weight in kilograms divided by the square of height in meters. BMI screens for weight categories that may lead to health problems, but it does not diagnose the body fatness or health of an individual" [35]. Among the 42 valid responses, participants were categorised as seen in Table 1.

Table 1. Body Mass Index of Participants

Body Mass Index	Weight category	Percent of participants
< 18.5	Underweight range	16.7%
18.5 to <25	Healthy Weight range	66.5%
25 to <30	Overweight range	14.4%
>30	Obesity range	2.4%

6.3 Barriers and Motivators for Physical Activity and Wellbeing

Participants described the barriers and motivators to engage in activities promoting their health. Answers were transcribed and grouped in themes. Participants reported a number of barriers for physical activity and wellbeing (see Figure 3): lack of motivation and self-discipline, injury and illness, lack of time, conflict with other activities (such as work and studies), lack of mental health, and lack of facilities. The motivators for physical activity and wellbeing were (see Figure 4): good health and physical appearance, a social support (such as friends and coach), affordable and available equipment, fun, enjoyable and recreational activities, and free time. Taken together, these findings point to the importance of motivational, social, and technical factors in the promotion of health. Some of these barriers and motivators for health are addressed in serious games such as "BehaviourCoach". Indeed, engaging with "BehaviourCoach" can be done in different facilities, with short amounts of free time. It is designed to allow for multiple players to interact, thus fostering social support. The activities are fun and enjoyable, and do not require special equipment.

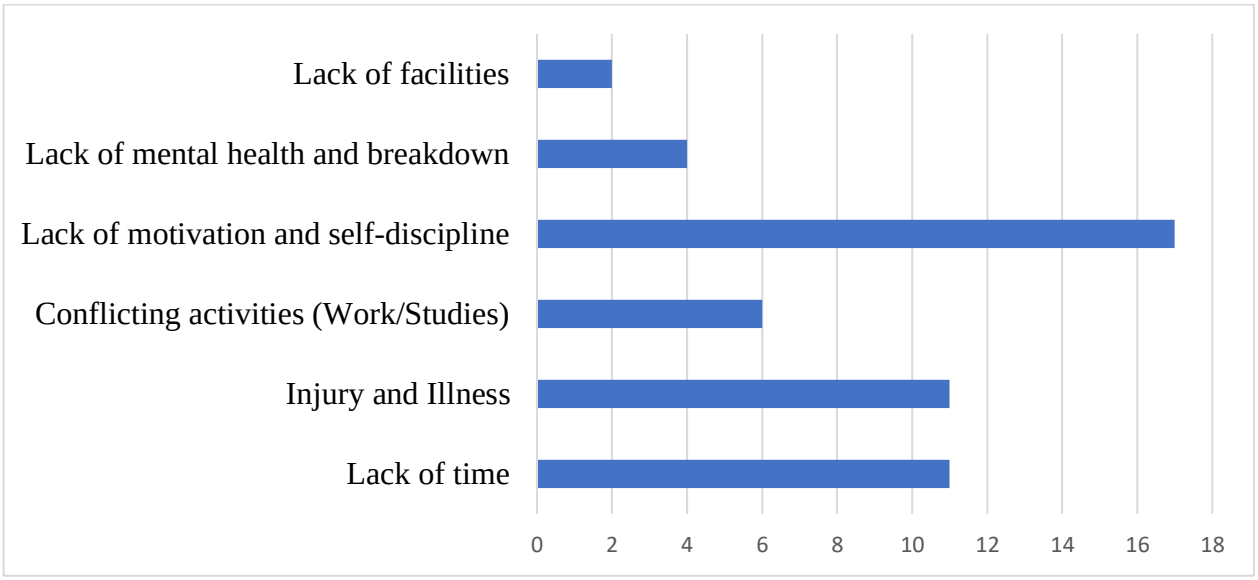

Figure 3. Barriers for physical activity and wellbeing

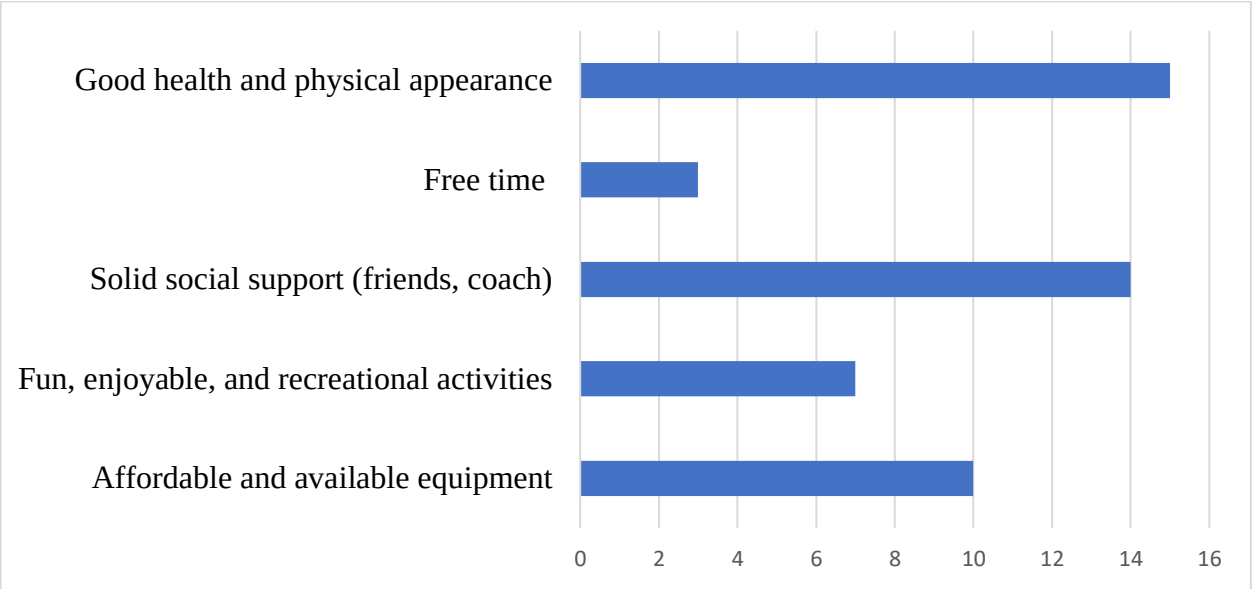

Figure 4. Motivators for physical activity and wellbeing

6.4 User experience of the web-based application

The next section reports the assessment of "BehaviourCoach" after participants played the game for 45 minutes. Overall, participants reported a positive user experience. First, the social elements of the game such as playing with other players (M = 6.22, SD = 1.05) and the interaction with others (M = 6.33, SD = 1.10) were highly ranked. Second, the fun and enjoyable experience (M = 5.92, SD = 1.51) was highly rated by the participants, and they did not feel bored while playing (M = 2,67, SD = 1.80). Third, the web application design such as the game interface (M = 5.88, SD = 1.15) and clear game instructions (M = 5.81, SD = 1.21) were also ranked as high. On the other hand, the motivation to do well at the game (M = 5.48, SD = 1.65) and the visual appeal of the web application (M = 5.31, SD = 1.50) yielded moderate scores. Table 2 showcases the assessments rank-ordered from highest to lowest.

Table 2. User experience of BehaviourCoach

Items	Evaluation	
	M	*SD*
I find the game supports social interaction between players.	6.33	1.1
I like to play this game with other players.	6.22	1.05
I think the game is fun.	5.92	1.51
I find the game's interface to be easy to navigate.	5.88	1.15
I find the instructions of the game to be straightforward.	5.81	1.21
I enjoy the game's graphics.	5.71	1.47
I am very focused on my own performance while playing the game.	5.48	1.65

I think the game is visually appealing.	5.29	1.76
I feel bored while playing the game. (*Reverse coded item*)	2.67	1.80

6. 5 Correlations between user experience and intention to use BehaviourCoach

This section examines the relationships between participants' user-experience of "BehaviourCoach" and their intention to use this serious game. Results of the Pearson's correlation test revealed a number of statistically significant relations. Taken together, these findings suggest that elements of "enjoyment", "social interaction", and "appealing game interface" are closely linked to intention to use serious games in the health domain.

First, there was a significant positive large correlation between intention to use "BehaviourCoach" and the evaluation that the game is fun (r = .561, p<.001). On the other hand, Pearson's correlation test revealed a significant negative moderate relationship between intention to use "BehaviourCoach" and the evaluation that the game is boring (r = -.395, p<.001).

Second, Pearson's coefficient correlation test indicated a significant positive medium to large relationship between intention to use "BehaviourCoach" and the evaluation that the application supports social interaction (r = .488, p<.001) and playing a fitness game with others (r = .462, p<.001).

Third, intention to use "BehaviourCoach" was significantly positively related to the evaluation that the game is visually appealing (r = .643, p<.001) and when one enjoys the game's graphics (r = .563, p<.001).

Taken together, these results support the idea that digital interventions that include social elements, fun activities, and technological elements that are attractive to the user, may encourage participation in beneficial health behaviours.

6. 6 Predicting intention to use BehaviourCoach

Participants generally agreed that using "BehaviourCoach" will enable them to take action related to their health more quickly (M = 4.37, SD = 1.70). However, there was low levels of willingness to use "BehaviourCoach" for health and wellness (M = 2.85, SD = 1.91) in the longer term.

Two multiple regression analyses were deployed to examine the association between overall health, body mass index, and subjective wellbeing (predictor variables) and intention to use "BehaviourCoach" (outcome variable).

First, a multiple regression was run to predict "using BehaviourCoach to take action related to one's health more quickly" from overall health, body mass index, and subjective wellbeing. The results showed that the overall model was statistically significant accounting for 54.4% of the variance in intention to use "BehaviourCoach", F(3, 52) = 14.725, p <.001. Overall health added statistically significantly to the prediction (β = -.613, p = .001) such that when levels of overall health increased, intention to use "BehaviourCoach" tended to decrease. Subjective wellbeing was also a significant predictor (β = .879, p < .001) such that when participants reported higher levels of subjective wellbeing, they reported greater intention to use "Behaviour Coach". Body Mass Index was not a significant predictor (p = .077).

To predict "willingness to use BehaviourCoach for health and wellness" from overall health, body mass index, and subjective wellbeing, a multiple regression was run. This model was not statistically significant (p =.146), suggesting that these predictors taken together are not related to intention to use "BehaviourCoach" on the long-term.

7. Discussion

The current study aimed to expand the understanding of technology use for health promotion, more specifically the use of serious games in health. In order to do so, the game "BehaviourCoach" was designed. The development of this serious game relied on important considerations. First, psychological theories and frameworks were applied in the design and development of activities for health promotion. Second, the development of "BehaviourCoach" took into account the social and cultural contexts, ensuring that it would correspond to the needs and perceptions of the target users [36]. Third, diverse gamification elements were used to ensure engagement and motivation. Fifty-five participants tested "BehaviourCoach" during a 45-minute intervention and reported their user-experience. It was important to consider: How do users experience and evaluate "BehaviourCoach" for health promotion? How do elements of serious games and participants' health status relate to intention to use "BehaviourCoach"?

The user experience of the web application was positive with participants reporting that they liked to play this game, that they found the game supported social interaction, that it was fun and that the web application interface was easy to navigate. Results further highlighted the importance of social and technical components of the web-application as they relate to intention to use the web-application. Indeed, findings suggest that when participants perceived the game as enjoyable and that it encouraged interaction with other players, they tended to report a stronger intention to use this web-based application for their health, and vice versa. Moreover, when participants evaluated the web-based application interface as visually appealing and easy to navigate, they reported more willingness to use the application in the future, and vice versa.

Participants also reported moderate to high levels of agreement that using "BehaviourCoach" will enable them to take action related to their health more quickly. This may suggest the "BehaviourCoach" or serious games in general may be considered for a rapid change or adoption of health behaviours for "quick" results. In contrast, participants somewhat disagreed that they would be willing to use "BehaviourCoach" for their health and wellness in the long-term. We may argue that intention to use "BehaviourCoach", in this sample, was stronger for short-term use. Other strategies may have to be considered for long-term use. Furthermore, results showed that overall health and subjective wellbeing were significant predictors of "using BehaviourCoach to take action related to one's health more quickly" but not for overall use of "BehaviourCoach" on the long term. Further studies should examine psychological, health factors, and elements of serious games that promote sustained use of serious games in health promotion.

Findings also suggest that such web-based applications may address some of the barriers and motivators of physical activity and wellbeing in the context of the country. Indeed, participants reported that motivational factors (such as self-discipline, self-management and ability to have free time, work-life balance…), social factors (such as social support, enjoyment, illness and injury), and technical factors (free and adequate facilities, affordable equipment) influence their will to engage in health benefitting behaviours. The use of web-based application for health may provide some answers to these barriers and motivators for healthy lifestyles.

Strengths and limitations

To our knowledge, it is the first research project in Mauritius that uses an intervention to investigate the role of gamification on improving physical activity as well as a broader definition of wellbeing. Several points are important to highlight here. First, intervention studies are important as they enable a control of procedures, measurement of key variables in the appropriate time-order and controlled environment. Second, the web application was tailored to the Mauritian context with appropriate activities and names that fit the country. We

proposed that this increased the familiarity and relevance of the game and thus engagement of the participants. Another strength of this study was the multidisciplinary approach. As gamified health technologies represent the intersection of physical and mental health research and human-computer interaction, it was of utmost priority to combine expertise from gamification and digital tools studies, health promotion and psychology research. This project successfully brought together scholars from psychology and digital technologies as well as web developers and health professional experts. This synergy allowed the answering of challenging questions.

Some limitations of this study need to be acknowledged. The sample size of 55 participants was small. Participants consisted mostly of university students that were in overall good health. Indeed, on average, participants reported being sufficiently active as a group to meet the World Health Organization (2022) guidelines of 150 minutes per week of activity and participants reported moderate levels of subjective mental health. This may limit the generalisability of the results. It would be useful to diversify the sample in terms of age, professional status, and levels of overall health to ensure better external validity. On one hand, future research could examine the use of "BehaviourCoach" across different age groups. It can be hypothesized that younger users will be more inclined to use such digital tools for health compared to older adults. Moreover, the intention to use the digital tool for health may rely on different factors and barriers (i.e., digital divide across generations, age-appropriate activities, …). On another hand, the testing of "BehaviourCoach" should include participants with various levels of overall health. This serious game can be tested, under medical supervision, for participants with varying levels of fitness and mental health, as well as some chronic illnesses and overweight.

Finally, this study was a relatively short intervention study (approx. 60 minutes) and captured data at one point in time. In this sense, the findings of the current study do not assess the contribution of the web-based application to the effectiveness and adherence to health promoting activities.

The investigation of serious games on health promotion in Mauritius is still in its nascent stages, paving the way for the development of an ambitious research programme in the future. In this context, the current study has facilitated an initial evaluation of a web-application for physical and mental health. The feedback received has informed further development of the BehaviourCoach application, which will be used in a large-scale national study targeting a representative sample of twelve hundred participants (N=1200) across the Republic of Mauritius. This will provide an opportunity to derive insights that could be generalised to other developing countries sharing similar contexts.

8. Conclusions

This study represents a pioneering effort to combine digital technologies and the field of psychology to promote overall wellbeing in the distinctive context of Mauritius. To achieve this, a web-application named "BehaviourCoach" was developed and an initial evaluation was conducted to explore a) how users experience and evaluate this web-application for health promotion and b) the relationship between serious game elements, participants' health status, and their intention to use the web application. This study enabled an assessment of usability, user acceptance, and the overall evaluation of a web-based application, with a particular focus on the gamification elements that underpin health interventions [22]. This user-centric investigation assessed the evaluative sentiments of participants toward "BehaviourCoach" a serious game app geared toward the promotion of wellness. The findings of this study underscored the favourable reception of the web application, with participants reporting that they liked to play this game, that they found the game supported social interaction, that it was fun and that the web application interface was easy to navigate. Results further highlighted the importance of social and technical components of the web-application as they relate to intention

to use the web-based application. Indeed, results showed that when participants perceived the game as enjoyable and that it encouraged interaction with other players, they tended to report a stronger intention to use this web-based application for their health, and vice versa. Moreover, when participants evaluated the web-based application interface as visually appealing and easy to navigate, they reported more willingness to use the application in the future, and vice versa. Future research could build on these findings to assess the effectiveness of serious games on the long term and across various health domains. Nonetheless, this study marks a significant advancement in the development of web-based applications for health promotion in developing countries, establishing a valuable foundation for future research in similar settings.

Acknowledgments

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