

Perceived benefits and barriers to physical exercise: A comparative analysis of first year and senior students at a South African University

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Abstract

The purpose of this research was to determine the perception of university undergraduate students regarding the benefits and barriers to physical exercise. A self-administered survey questionnaire was used to collect data from 480 students at North-West University, Vaal campus in Gauteng province, South Africa. Data analysis involved the use of descriptive statistics and mean comparison with independent t-tests. Physical performance and psychological outlook were perceived as the greatest among the benefits of physical exercise, whereas physical exertion and lack of facilities were perceived as the strongest among the barriers to physical exercise. Overall, undergraduate students perceived participating in exercising to have more benefits than adverse effects and there was no significant difference between first year and senior students. The results of the study point to associated challenges relating to physical exercise among students in South Africa.

Keywords: Physical exercise, benefits/barriers scale, undergraduate university students.

How to cite this article:

Muzindutsi, P.F., Nishimwe-Niyimbanira, R. & Sekhampu, T.J. (2014). Perceived benefits and barriers to physical exercise: A comparative analysis of first year and senior students at a South African University. *African Journal for Physical, Health Education, Recreation and Dance*, October (Supplement 2:1), 169-181.

Introduction

Participation in different forms of physical activities is very important as it has positive effects on individuals' health. The physical and psychosocial benefits of physical activities for individuals of all ages relate to disease prevention, physiological and psychological gains from regular participation in physical activities (Juarbe, Turok & Pérez-Stable, 2002; Lopez, Gallegos & Extremera, 2010). Parallel to these benefits, there are well known disadvantages of being physically inactive. For example, lack of participating in physical activities has been identified to be among the major causes of major health problem affecting many people in different regions of the world (Lovell, Ansari & Parker, 2010; World Health Organisation, 2002). Some of the health problems, linked to a lack of physical activity, include coronary artery disease, hypertension, obesity,

anxiety and depression and lower back problems (Australian Institute of Health & Welfare, 2004).

In broad terms, physical activity refers to any movement of a body produced by skeletal muscles that result in energy expenditure (Caspersen, Pwell & Christernson, 1985). In practical terms, physical activity includes all activities related to occupation, sports, conditioning, and household chores. Physical activity is often used to describe physical exercise because both physical activity and exercise involve any bodily movement produced by skeletal muscles that expends energy. This energy expenditure can be measured in kilocalories ranging continuously from low to high, and are positively correlated with physical fitness as intensity, duration and frequency of movements increase (Caspersen et al., 1985). Literature (Barfield & Malone, 2013; Caspersen et al., 1985; Lopez et al., 2010) makes a distinction between physical activity and exercise. Exercise is seen as a subset of physical activity that is planned, structured, repetitive with a purpose of improving or maintaining physical fitness. Considering that these two different terms are often used interchangeably, this study focused on physical exercise.

Participation in physical exercise is influenced by external variables such as time, availability of/accessibility to facilities and social support, and internal variables such as feeling and thinking (Lovell et al., 2010). These internal and external variables do not only influence the involvement in physical exercises but also affect individuals' perception of participation in physical exercise. Similarly, perceptions of benefits and barriers to physical exercise are among the factors that influence individuals' involvement in actual physical exercise (Brown, Huber & Bergman, 2006). Thus, it is very important to understand peoples' perceptions towards physical exercise.

Previous studies (Barfield & Malone, 2013; Brown et al., 2006; Peltzer & Pengpid, 2006; Lopez, et al., 2010; Lovell et al., 2010; Nolan, Sandada & Surujlal, 2011) used *the Exercise Benefits/Barrier Scale* (EBBS) to determine how various individuals perceive benefits and barriers of physical exercise. The perceived benefits and barriers of physical exercise vary from one group to another and are influenced by different factors. The classification of benefits is based on factors such as life enhancement, physical performance, psychological outlook, social interaction and preventive health (Lovell et al., 2010; Nolan et al., 2011). Additionally, barriers to participation in physical exercises are mostly classified into factors related to exercise milieu, time expenditure, physical exertion and family discouragement (Barfield & Malone, 2013; Brown et al., 2006). These classifications show that both perceived benefits and barriers of physical exercise emerge from internal and external factors. Thus, these factors affecting perceptions towards physical exercise and the involvement in physical exercise tend to be related. In other words, there is a close link between the

individuals' perceptions of benefits and barriers to physical exercise and their involvement in physical exercise.

Empirical studies on perceived benefits and barriers of physical exercise also revealed that the ranking of these benefits and barriers tend to vary among different population groups. For example, a study by Lovell et al. (2010) found that UK students perceived physical performance as the greatest benefit of physical exercise; while Nolan et al. (2011) found that first year students at a South African university considered improved health to be the greatest benefit of physical exercise. On the contrary, Brown et al. (2006) found that US students considered factors related to psychological improvement to be the greatest benefit of participating in physical exercise. With regard to barriers of physical exercise, Daskapan, Tuzun and Eker (2006), Juarbe et al. (2002), Lopez et al. (2010) and Van Niekerk (2010) found that time constraints was perceived to be the greatest barrier of physical exercise; whereas Lovell et al. (2010) and Barfield and Malone (2013) found physical exertion to be the greatest barrier of physical exercise. Nolan et al. (2011) also included physical exertion among the major barriers but alluded to the lack of facilities as the greater barrier to physical exercise. Overall, there seem to be little consensus among these findings; suggesting that it may not be easy to rank perceptions about benefits and barriers of physical exercise. Hence, additional research on this topic may shed more light on these conflicting findings.

Studies that focused on university students showed that perceptions regarding participation in physical exercise vary among students due to academic related factors. Academic commitment has been found to be among the major factors influencing students' perceptions towards participation in physical activities. For example, academic commitment becomes a barrier of participating in physical exercise when students fail to balance academic success and physical exercise (Daskapan et al., 2006). Other factors such as field of study, level of study, gender and social support within university campuses tend to be among major factors affecting physical exercise among university students (Brown et al. 2006; Lovell et al., 2010). Furthermore, it was noted that university students tend to perceive benefits from participation in physical exercise to be high than barriers (Lovell et al., 2010; Nolan et al., 2011).

Having shown that factors such as academic commitment and social support within university campuses have an effect on how students perceive benefits and barriers of physical exercise, it is important to highlight that these factors may not be at the same level among all undergraduate students. A first year student may not have the same level of academic commitment or social support within the campus compared to a senior year student (a second or third year student). This may therefore suggest that first year students may perceive benefits and barriers of physical exercise differently from senior students. This study aimed at

testing this proposition by investigating whether these two groups of students perceived benefits and barriers of physical exercise differently. To achieve this, the following objectives were formulated:

- To compare perceived benefits to perceived barriers of physical exercise among undergraduate university students.
- To assess if there is a difference between first year and senior undergraduate university students' perceptions of benefits of participating in physical exercise.
- To determine whether first year and senior undergraduate university students perceive barriers of participating in physical exercise differently.

Methodology

Sample

Undergraduate students at the North-West University, Vaal campus in the Gauteng province of South Africa formed the sample of this study. Random sampling, which ensures that each element in the population has a fair and equal chance of being included in the sample (Brown, O'Connell & Murphree, 2011), was used to recruit the participants. Of the 540 questionnaires administered, 476 (95%) completed questionnaires were returned. Of the 476 participants, 218 (45.8%) were senior (2nd and 3rd) students; while 258 (54.2%) were first year students. The mean age of the participants was 19.88 years and almost all of them (96.8%) were never married. More female students (53.6%) than male students (46.4%) participated in the study. Race distribution showed that the majority (82.8%) of students were Africans. The majority of students (97.7%) were South African and most of them (70.5%) were from the Gauteng province.

Instrument and procedures

The Exercise Benefits Barriers Scale (EBBS) developed by Sechrist, Walker and Pender (1987) was used to measure the perceived benefits and barriers of participating in physical exercise. This scale has been validated by various studies in different contexts (Brown et al., 2006; Ortabag, Ceylan & Akyuz, 2010). The questionnaire comprised two sections. The first section captured demographic information of the participants. The second section comprised the EBBS scale which was scored on a four-point Likert scale ranging from strongly agree (1) to strongly disagree (4). This scale has 43 questions that captured information on perceived benefits and barriers of participation in physical exercise. The benefit component includes 29 questions categorised into five subscales namely, life enhancement (8 questions), physical performance (8 questions), psychological outlook (6 questions), social interaction (4 questions) and preventative health (3 questions). The barrier component included 14 barrier items categorised into four subscales, namely exercise milieu (6 questions), time

expenditure (3 questions), physical exertion (3 questions) and family discouragement (2 questions).

For the current study, Cronbach's Alpha test was used to test for internal consistency. The values of this Alpha were 0.887 and 0.709 for the benefits and the barriers components, respectively. The overall internal consistency for both subsets (benefits and barriers) was $\alpha=0.768$. These values were above 0.6 standard cut-off point (Pallant, 2013), indicating that the benefits and barriers scales are reliable.

Data analysis

In the analysis of data, scores for each participant were standardised in order to formulate each sub-scale. The total score for each sub-scale was divided by number of items included in that scale or sub-scale. The purpose of this adjustment was to allow for direct comparison between sub-scales. Possible scores ranged from 1 to 4; where 1 represented the highest perception of a benefit and a barrier. This implies a low score is associated with high benefits and barriers. Descriptive statistics such as mean, standard deviation and cross tabulations were used to analyse the data. Furthermore, mean comparison with an independent t-test was used to assess whether first year and senior students perceived benefits and barriers to physical exercise differently.

Results

Benefits to physical exercise

Table 1 shows the perceived benefits of physical exercise. It summarises percentages distribution as well the means and standard deviations for each item of the benefits sub-scales. Students tend to strongly agree with the following six statements: 'exercising increases my level of physical fitness (50.2%)', 'exercise improves the way my body looks' (48.2%); 'exercise decreases feelings of stress and tension for me' (42.8%), 'exercise improves my mental health' (42.3%), 'exercise improves my flexibility' (42%), 'exercise increases my stamina'(41.4%) and 'I enjoy exercise' (41.4%). Overall, the majority of students (94.8%) at least agreed (strongly agree + agree) with this statement: 'exercising increases my level of physical fitness; whereas 50.5% of students at least disagree (strongly disagree + disagree) with this statement: 'exercising increases my acceptance by others'. This suggests that physical performance is the greatest perceived benefit of physical exercise, while social interaction is perceived to be the lowest.

Table 1: The exercise benefits scale: percentage for each questionnaire item

Variables	Strongly			Strongly Agree	Mean (SD)
	Agree	Disagree	Agree		
Life Enhancement Sub-scale					1.96 (0.76)
My disposition is improved with exercise	19.6	54.5	21.9	4.0	2.10 (0.75)
Exercising helps me sleep better at night	34.8	43.9	17.6	3.7	1.90 (0.82)
Exercise improves my overall body functioning	39.9	51.1	8.2	0.9	1.82 (0.72)
Exercise helps me decrease fatigue	20.0	47.5	27.0	5.5	2.18 (0.81)
Exercising improves my self-concept	27.7	55.2	13.5	3.5	1.93 (0.74)
Exercising increases my mental alertness	34.5	53.0	10.5	2.0	1.80 (0.70)
Exercise allows me to carry out normal activities	33.3	46.6	17.4	2.6	1.89 (0.78)
Exercise improves the quality of my work	22.7	53.7	20.5	3.1	2.04 (0.74)
Physical Performance Sub-scale					1.71 (0.69)
Exercise increases my muscle strength	39.9	51.1	8.2	0.9	1.70 (0.65)
Exercising increases my level of physical fitness	50.2	44.6	4.1	1.1	1.56 (0.63)
My muscle tone is improved with exercise	31.4	53.9	15.5	3.2	1.87 (0.74)
Exercising improves my cardiovascular system	37.6	51.5	9.0	2.0	1.75 (0.70)
Exercise increases my stamina	41.4	48.6	8.3	1.7	1.70 (0.69)
Exercise improves my flexibility	42.0	47.8	8.0	2.2	1.70 (0.71)
Exercising improved my physical endurance	35.0	53.3	9.1	2.7	1.79 (0.71)
Exercise improves the way my body looks	48.2	42.8	7.8	1.3	1.62 (0.69)
Psychological Outlook Sub-scale					1.85 (0.74)
I enjoy exercise	41.4	48.5	15.4	4.6	1.93 (0.81)
Exercise decreases feelings of stress and tension	42.8	43.8	11.1	2.3	1.73 (0.75)
Exercise improves my mental health	42.3	47.6	8.5	1.5	1.69 (0.69)
Exercising makes me feel relaxed	26.0	52.3	18.2	3.5	1.99 (0.76)
Exercise improved my feelings of wellbeing	28.4	54.1	14.6	2.8	1.92 (0.74)
Exercise gives me a personal accomplishment	35.6	48.5	14.8	1.1	1.81 (0.72)
Social Interaction Sub-scale					2.30 (0.88)
Exercising lets me have contact with friends	18.9	44.9	30.5	9.7	2.31 (0.89)
Exercising is a good way to meet new people	22.6	42.8	27.6	7.0	2.19 (0.87)
Exercise is good entertainment for me	23.2	43.5	25.2	8.1	2.18 (0.88)
Exercising increases my acceptance by others	12.2	37.4	35.9	14.6	2.53 (0.89)
Preventive Health Sub-scale					1.86 (0.76)
I will prevent heart attacks by exercising	32.5	53.2	10.7	3.4	1.85 (0.74)
Due to exercise, I don't have high blood pressure	33.5	55.2	8.9	2.4	1.80 (0.69)
I will live longer if I exercise	35.7	42.5	16.4	5.5	1.92 (0.86)

The mean and standard deviations show that benefits sub-scales can be ranked (from the smallest to the highest) as follows: physical performance (1.71 ± 0.69), psychological outlook (1.85 ± 0.74), preventive health (1.86 ± 0.76), life enhancement (1.96 ± 0.76) and social interaction (2.30 ± 0.88). This implies that physical performance was perceived to be the greatest benefit of physical

exercise followed by psychological outlook and preventive health; while social interaction was ranked lowest among benefits of physical exercise.

Barriers to physical exercise

Table 2 summarises the responses to each item under perceived barriers of physical exercises. Most of participants at least disagreed (disagree + strongly disagree) with a number of statements under barriers of physical exercises. Some of these statements are: ‘I am too embarrassed to exercise’ (87.9%), ‘it costs too much to exercise’ (77.1%), ‘I think people in exercise clothes look funny’ (76%), ‘exercise takes too much time from family relationships’(74.8%) and ‘exercise takes too much time from my family responsibilities’ (72.8%). However, students at least agreed (strongly agree + agree) with the statements that ‘exercise tires me’ (60%) and ‘there are too few places for me to exercise’ (52%).

Table 2: The exercise barriers scale: percentage for each questionnaire item

Perceived Barriers Items	Strongly Agree	Agree	Disagree	Strongly Agree	Mean (SD)
Exercise Milieu Sub-scale					2.83 (0.89)
Places for me to exercise are too far away	15.9	23.	42.8	18.3	2.63 (0.96)
I am too embarrassed to exercise	3.4	8.6	38.9	49.0	3.34 (0.78)
It costs too much to exercise	7.9	15.1	46.3	30.8	3.00 (0.88)
Exercising timetables are inconvenient	13.0	26.7	46.7	11.7	2.59 (0.86)
People in exercise clothes look funny	9.0	15.1	45.2	30.8	2.96 0(.90)
There are too few places for me to exercise	17.6	34.5	33.2	14.8	2.45 (0.95)
Time Expenditure Sub-scale					2.84 (0.80)
Exercising takes too much of my time	10.0	25.0	53.8	11.1	2.66 (0.81)
Exercise takes too much family time	7.7	17.3	52.0	22.8	3.01 (0.80)
Exercise takes too much time from my family responsibilities	6.1	21.1	51.7	21.1	2.86 (0.81)
Physical Exertion Sub-scale					2.51 (0.85)
Exercise tires me	15.5	44.5	31.2	8.8	2.33 (0.84)
I am fatigued by exercise	9.9	37.4	43.3	9.5	2.52 (0.80)
Exercise is hard work for me	11.1	29.1	42.0	17.8	2.67 (0.90)
Family Discouragement Sub-scale					2.85 (0.96)
My spouse does not encourage exercising	10.5	20.1	42.0	27.5	2.83 (0.94)
My family does not encourage exercising	11.3	20.8	37.1	30.8	2.87 (0.98)

The mean and standard deviation for each barrier sub-scale show that physical exertion (2.51 ± 0.85) has the lowest mean followed by exercise milieu (2.83 ± 0.89), and time expenditure ($2.84 \pm .80$) and family discouragement (2.85 ± 0.96), respectively. This implies undergraduate students considered physical exertion to be the greatest barrier of physical exercise; whereas, family discouragement was perceived to be the lowest.

Comparative analysis of the benefits and barriers to exercise

Table 3 reports the correlation between sub-scales. For the benefits sub-scales (Part A of Table 3), all correlation coefficients are positive and statistically significant at the 0.01 level of significance. This implies that there is high level of association between the benefits sub-scales. Similarly, a positive significant correlation among barriers sub-scales is observed, suggesting that these barrier sub-scales are also highly correlated.

Table 3: Correlations between sub-scales

A. Benefits of physical exercise					
Benefits sub-scales	Physical Performance	Psychological Outlook	Preventive Health	Life Enhancement	Social Interaction
Physical Performance	1				
Psychological Outlook	.697**	1			
Preventive Health	.524**	.454**	1		
Life Enhancement	.750**	.697**	.513**	1	
Social Interaction	.527**	.577**	.379**	.572**	1

B. Barriers of physical exercise				
Barriers sub-scale	Physical Exertion	Exercise Milieu	Time Expenditure	Family Discouragement
Physical Exertion	1			
Exercise Milieu	.327**	1		
Time Expenditure	.512**	.489**	1	
Family Discouragement	.260**	.381**	.396**	1

** Correlation is significant at the 0.01 level (2-tailed).

The correlation between benefits and barriers sub-scales is summarised in Table 4. Physical performance is positively and significantly correlated to family discouragement. This implies that students who perceive physical performance as a benefit also perceive family discouragement as barrier to exercise. Life enhancement is negatively and significantly correlated to exercise milieu. Students who associate benefits with life enhancement also tend not to associate barriers with exercise milieu. The benefit sub-scale of social interaction is positively and significantly correlated with time expenditure and family discouragement barrier sub-scale. This implies that students who associate

benefits with social interaction tend to associate barriers with time expenditure and family discouragement.

Table 4: Correlations between benefits and barriers sub-scales

Variables	Physical Exertion	Exercise Milieu	Time Expenditure	Family Discouragement
Physical Performance	.017	-.001	.016	.206*
Psychological Outlook	.021	.014	.015	.027
Preventive Health	-.026	.058	.003	-.004
Life Enhancement	.005	-.208*	.018	.004
Social Interaction	.019	.063	.214*	.306*

*. Correlation is significant at the 0.05 level (2-tailed).

The comparison of mean score for each benefits sub-scale between first year and senior students (Table 5) shows that the mean scores are less than 2 for the first 4 sub-scales and greater than 2 for the last sub-scale. This implies that both first year and senior undergraduate students mostly agreed that benefits of physical exercise are associated with physical performance, psychological outlook, preventive health and life enhancement, while they disagreed that benefits of exercises are associated with social interaction. Small t-values (<2) and high p-values (> 0.05) for all sub-scales mean that the difference between the mean values for first year and senior students was not statistically significant. This implies that both first year and senior students have similar perceptions of benefits to physical exercise. However, at the 0.1 level of significance, there appears to be a difference in the means for life enhancement and social interaction. This suggests that senior students perceived life enhancement and social interaction more (smaller mean values) important than first students.

Table 5: First year and senior students mean comparison of benefits sub-scales

Categories	Physical Performance	Psychological Outlook	Preventive Health	Life Enhancement	Social Interaction
First year students	1.723 (.49)	1.868 (.56)	1.878 (.58)	1.996 (.49)	2.389 (.66)
Senior students	1.714 (.47)	1.813 (.54)	1.827 (.55)	1.913 (.49)	2.215 64)
T-test	0.197	-1.065	-.968	-1.89	-1.85
P-values (Sig.)	.859	.288	.333	.0971	.0982

The mean responses for the barriers of physical exercises (Table 6) for first years was slightly lower for physical exertion; whereas the mean response for senior students was lower for exercise milieu and family discouragement. The mean responses for both first year and senior students appear to be the same for time expenditure. However, these mean differences are not statistically significant, even at the 0.1 level of significance. This implies that both first year and senior students have a similar view towards barriers of physical exercises.

Table 6: First year and senior students mean comparison of barriers sub-scales

Categories	Physical Exertion	Exercise Milieu	Time Expenditure	Family Discouragement
First year students	2.503 (.59)	2.856 (.514)	2.805 (.64)	2.890 (.78)
Senior students	2.522(.61)	2.813 (.515)	2.807 (.64)	2.861 (.81)
T-test	.334	.373	.023	-.387
P-values (Sig.)	-.892	.373	.982	.699

Discussion

Findings of the current study revealed that undergraduate students perceived physical performance and psychological outlook to be important benefits of physical exercise. More specifically, undergraduate students consider physical fitness to be the highest benefit of physical exercise. This is in line with the findings by Lovell et al. (2010), which showed that physical performance and psychological outlook were perceived to be higher than other benefits. Similarly, a study by Brown et al. (2006) found that psychological benefits and physical performance were higher than other benefits, except that psychological benefits were ranked above physical performance. However, some of other similar studies concluded otherwise. For example, Nolan et al. (2011) and Juarbe et al. (2002) found that preventative health or health promotion was higher than other benefits of physical exercise. On life enhancement and social interaction, findings of the current study are similar to that of Lovell et al. (2010) and Nolan et al. (2011) which found life enhancement and social interaction to be rated significantly lower than other benefits of physical exercise.

Contrary to the above findings, Barfield and Malone (2013) found that social interaction was perceived to be the greatest benefit of physical exercise. This difference in the findings may be linked to different characteristics of participants and the environment surrounding such participants. For example, participants belonging to certain sport club may perceive social interaction to be higher than other benefits of physical exercise. This is the case with Barfield and Malone (2013), who used a sample of wheelchair soccer players. For students, different findings may be caused by factors such as level of study, level of sport participation and social support within campus (Brown et al., 2006; Lovell et al., 2010). For example, senior students with a heavy school work-load may link benefits of physical exercise with health improvement compared to first year students who may be coming from high school where participation in sport and exercises may be compulsory. Hence, first year students may link the benefits of physical exercise with physical performance. This may therefore explain why senior and first year students tend to perceive the benefits of life enhancement and social interaction differently.

Regarding barriers of physical exercise, this study found that physical exertion was perceived to be the greatest barrier of physical exercise with tiredness and

exercise milieu being the highest barriers. These findings are similar to those of other studies (Barfield & Malone, 2013; Lovell et al., 2010; Nolan et al., 2011) which found tiredness and exercise milieu to be the highest barriers of physical exercise. Similar to these studies, family discouragement was also found to be the lowest barrier of physical exercise. This was expected as the majority of students mostly stayed at the university residences or private accommodation away from their family members who may influence their participation in physical exercise. Contrary to these findings, some previous studies (Daskapan et al., 2006; Gyurcsik, Bray & Brittain, 2004; Juarbe et al., 2002) reported that lack of time was the greatest barrier to participation in physical exercise. This may suggest that participants of these studies were exposed to a different environment. For example, Daskapan et al. (2006) reported that Turkish undergraduate students did not have time to participate in physical exercise due to responsibilities related to family and social environment. Daskapan et al. (2006) further reported that family discouragement was the constraining factor of physical exercise because parents give academic success priority over exercise. This suggests that most of these Turkish students stayed with their family which is not the case with most of the students who participated in the current study.

Comparison of the means revealed that senior students perceived life enhancement and social interaction more important than first year students. The probable explanation for this finding is related to the level of acclimatisation with the university environment. On one hand, first year students may not focus on social interaction because these students are still new in the university environment (Nolan et al., 2011). On the other hand, senior students are familiar with the university environment, implying that some of them belong to sport clubs. This belonging to sport clubs explains why they considered social interaction as an important benefit as Barfield and Malone (2013) found that sport clubs' members tend to value the benefit of social interaction.

The limitation of the current study is that the results may be biased towards commerce students because participants were predominantly students from the faculty of Economic Sciences and IT. Hence, a further study involving more faculties and various campuses can shed more light on whether these findings can be generalised to all undergraduate university students.

Conclusion

This study found that undergraduate university students tend to perceive benefits of participating in physical exercise to be higher than barriers. It also revealed that both first year and senior students identify the benefits and barriers of participation in physical exercise in the same way; except that first year students tend to consider social interaction less important. Interventions, such as using orientation programmes to encourage first year students to join various sport

clubs available at the university, could help to decrease the perceived barriers. For senior students, an increase in sport facilities around campus may encourage participation in physical exercise and thus decreases the perceived barrier related to exercise milieu.

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