Original Article

The Inclusion of Sports & Exercise Related Module into Pharmacy Curriculum: Non-pharmacological Approach on Students' Health Parameters

Tahir et al. Sports & Exercise Outcome

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Abstract
Objectives: To promote a holistic approach to healthcare, the University of Cyberjaya (UoC) introduced a unique elective course called sport pharmacy which incorporates components of lifestyle interventions. Customers are increasingly seeking guidance on lifestyle factors that impact their health. Pharmacists with expertise in sports and exercise can meet this demand. However, there is a lack of studies about the impact of non-pharmacological approaches on health parameters among healthcare professionals and pharmacy students in Malaysia. The objectives of this study were to compare students' health parameters based on non-pharmacological approaches and identify the factors that motivate them to maintain their health.
Materials and Methods: The study comprised of 47 Year 4 pharmacy students in pre and post practical phase (September 2018 and November 2018), followed by post-resting phase (May 2019). Data collection form in the Sport Pharmacy course was used for the data collection.
Results: A little less than half of the students displayed normal Body Mass Index (BMI). After the post-resting period, there was a rise in the number of students classified as obese, as well as those with high TC and FBG. Around 23% continued to control their diet and 32% maintained their physical activity levels during the post-resting study.

Conclusion: Among those who did continue with their diet control, the main motivations were 'maintaining health' (34.8%) followed closely by 'seeing results'(30.4%) and 'feeling better' (26.1%). In the post-resting study, respondents were asked about the factors that motivated them to continue physical activity. The top three factors identified were health, feeling better, and having fun. On the other hand, the main reasons for not continuing a non-pharmacological approach were lack of motivation, study schedule, and lack of time. A significant impact on FBG was observed after conducting a 10-week non-pharmacological approach that included physical activity and diet control. Surprisingly, there was no noticeable impact on BMI and TC. The post-resting study revealed that only a minority (of the participants continued with the non-pharmacological approach, resulting in no significant changes in BMI, FBG, and TC.
Key words: Non-pharmacological, Body Mass Index, Fasting Blood Glucose, Total Cholesterol, Pharmacy Students

INTRODUCTION

Sports pharmacy is defined as the science and practice of dispensing medication and medical equipment for individuals participating in exercise or sport, and the provision of information and advice on exercise programs, treatment, and prevention of simple injuries.[1] Sport pharmacy course is offered by Faculty of Pharmacy, University of Cyberjaya as an elective course in Year 4 Semester 1 of Bachelor of Pharmacy. This course equips the students with knowledge and evidence-based advice on promotion and maintenance of good health through an active lifestyle .[1] There is a practical session where students need to conduct a non-pharmacological approach of diet control and physical activity (DCPA) for 10 weeks as part of their assessment.

Human health status can be defined by a variety of physiological health parameters such as BMI, FBG and TC.[24] According to World Health Organisation (WHO), BMI is defined as a person's weight in kilograms divided by the square of the person's height in metres (kg/m²).[26] Both low BMI (< 22.6 kg/m²) and high BMI (> 27.5 kg/m²) were associated with an increased risk of death from any cardiovascular disease (CVD), cancer, or other causes, resulting in an overall U-shaped association among East Asians but not among Indians and Bangladeshis.[25] According to Malaysian Clinical Practice Guideline on Management of Type 2 Diabetes Mellitus (2015), FBG is used as a diagnostic tool for type 2 diabetes mellitus based on venous plasma glucose in symptomatic individuals.[15] Yiling et al. (2009) found that retinopathy prevalence began to rise precipitously when after FPG exceeded 5.8 mmol/L [31]. Based on Malaysian Clinical Practice Guideline on Management of Dyslipidaemia (2017), TC > 5.2 mmol/L is used as one of the diagnosed tools for dyslipidaemia [16]. Raised TC is estimated to cause 2.6 million deaths and 29.7 million disability adjusted life years (DALYS).[27] In both the developed and developing countries, raised TC is a major cause of disease burden as a risk factor for ischaemic heart disease (IHD) and stroke.[27]

Non-pharmacological approaches (NPAs) are defined as science-based and non-invasive interventions on human health without involving using of drugs.[19] Examples are physical activity and diet control. Physical inactivity has been identified as the fourth leading risk factor for global mortality (6% of deaths globally).[29] In addition, physical inactivity is predicted to be the main cause for approximately 21–25% of breast and colon cancers, 27% of diabetes and approximately 30% of IHD burden [29]. WHO recommends that adults aged 18–64 years should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week or do at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity

activity to maintain health status [29]. Based on WHO (2018), a healthy diet helps to protect against malnutrition in all its forms, as well as NCDs.[28] An adequate, well balanced diet together with regular physical activity is a cornerstone of good health.[28] Nybo et al. (2010) found that FBG was reduced to a similar extent in both intense interval running (INT) and moderate intensity running (MOD) groups but remained unchanged in both strength training (STR) and control groups.[20] McManus et al. (2001) found that group with moderate fat based on Mediterranean diet reduced their weight and BMI significantly at 6, 12 and 18 months with an average weight loss of 4.8 kg as compared to low fat diet group [13].

Social cognitive theory including self-efficacy is defined as the belief that one can organise and execute a course action to achieve a specific goal and outcome expectations, which are beliefs that if a certain behaviour is performed it will lead to an anticipated outcome [14]. Based on theory of self-efficacy theory, emphasis on the importance of the individual and the individual's perceptions of his/her personal capabilities as key determinants of successful outcomes is essential towards behavioural change to affect others. It is vital pharmacy students experience themselves the activities of healthy eating and physical exercise as conceptualised in the 7 pillars of self-care [15]. Pharmacists and pharmacy students recalled limited opportunity for education in sports pharmacy. There is a growing need for specialist pharmacists in the area of sport and exercise [16].

Ilow et al. (2017) reported that 7.5% of males and 7.1% of females were found to be overweight among 1 168 pharmacy students in Poland.[10] In this study, hypertension was diagnosed in 27.2% of males and in 7.8% of females.[10] Most of the students did not consume enough fruits and vegetables (female students 61.8%, male students 75%).[10] Furthermore, low physical activity was declared by 41.9% of female students and by 31.9% of male students.[10] Bastardo (2011) also reported a similar finding that 106 (62%) pharmacy students did not exercise regularly, and male students (84.1%) were more likely to consume alcohol as compared to female students (59.8%).[3] Physical inactivity and unhealthy diet showed that there is a need for pharmacy students to practice non-pharmacological approach such as diet control and physical activity to maintain their health conditions. Hence, this study is very crucial to determine the impacts of non-pharmacological approaches on health parameters such as BMI, FBG and TC among Sport Pharmacy students.

MATERIALS AND METHODS

Participants and Study Design

This study was divided into a pre and post phase and post-resting phase conducted at University of Cyberjaya (UoC) in Cyberjaya. Pre and post phase was conducted from September 2018 to November 2018 and the post resting phase was conducted in May 2019 after a period of 6 months resting from the post study. In the study conducted, a group of 47 Year 4 Pharmacy students who elected to take Sport Pharmacy during their Semester 1 in 2018 were selected as participants. The study protocol was approved by UoC Research Ethics Review Committee (CRERC) (CUCMS/CRERC/FR/030). Informed consent was obtained from participants. A data collection form as used in the Sport Pharmacy course was administered to participants in pre, post and post-resting phases for documenting health parameters. Students measure their baseline health parameters during pre-phase and health parameters after conducting the practical session.

In the pre study phase, respondents' health parameters such as total cholesterol (TC), fasting blood glucose (FBG) and Body Mass Index (BMI) were measured as baseline health parameters. Subjects were required to fast for at least 8 hours before measurement of TC and FBG. TC and FBG were measured by withdrawing aseptically two drops of blood sample from the subject's fingertip. BMI was measured by using a weighing machine and stadiometer. Then, respondents carried out 10 weeks of diet control and exercise.

Diet control was defined as restriction of food calorie taken per day based on resting metabolism of respondent as measured in pre-study. Participants recorded their food intake daily including breakfast, lunch, dinner and snacks and total the food calorie intake. Participants were encouraged to conduct physical activity for at least 150 minutes of moderate-intensity aerobic physical activity or at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week. Diet intake and physical activity were submitted as a weekly report via online every Sunday. At the 11th week, a post-study phase was conducted in which respondents' health parameters were re-measured. Post-resting phase was conducted 6-months later in May 2019 in which participants' health parameters were re-measured in to compare differences in health parameters between post and post-resting study.

Statistical analysis

All results were analysed with Statistical Package for Social Sciences (SPSS) software (version 25). Results were expressed as mean ± standard deviation for quantitative variables such as BMI, TC and FBG in pre, post and post-resting study. The statistical significance was set at $p < 0.05$. Paired samples t-test was performed to compare the mean difference of TC in pre and post studies. The Wilcoxon signed-ranked test was used to compare median difference in BMI and FBG between pre-and post-resting phase, post and post-resting phase and median difference in TC between post and post-resting phase. Multiple Response Analysis was used to study the factors for continuing or not continuing diet control and physical activity.

RESULTS

Table 1 showed health parameters of students in pre, post and post-resting phase. In the pre-phase, out of 47 participants 22 participants were within normal BMI (47%), six were underweight (13%), nine were overweight (19%) and ten were obese (21%). Twelve participants (26%) showed borderline high TC (5.2 - 6.2 mmol/L) and two participants (4%) showed high TC while the rest (70%) were within normal TC level (< 5.2 mmol/L). Only one respondent had low FBG level (< 3.9 mmol/L) while the rest (98%) showed normal FBG level (≤ 6.0 mmol/L).

In post study, out of 47 students, same number of participants were within normal BMI (49%) and underweight (13%) categories. Eight participants were overweight (17%) and 11 were obese (21%). Eight participants (17%) showed borderline high TC and two participants (4%) showed high TC while the rest (79%) were within normal TC level. Moreover, three participants (6%) had Impaired FBG (6.1 - 6.9 mmol/L) whereas the rest (94%) showed normal FBG level.

In post-resting study, same number of participants remained in each BMI category as in post study. Four participants (9%) showed borderline high TC and six participants (13%) showed high TC while the rest (79%) showed normal TC level (≤ 5.2 mmol/L). Two respondents (4%) showed Impaired FBG and only one respondent (2%) showed high FBG whereas the rest (94%) showed normal FBG level.

Figure 1 showed only 11 (23%) students continued diet control whereas 36 (77%) students did not continue diet control in post-resting study. Main factors for continuing diet control in post-resting study were seen in Table 2. Out of 11 respondents who continued diet control, the main factors for continuing diet control were health (34.8%), followed by seeing results (getting fitter and healthier) (30.4%) and feeling better (26.1%). Only one respondent chose friends and praise or rewards (4.3%) respectively as the main factor for continuing diet control. Main factors for not continuing diet control in post-resting study were seen in Table 3. Among 37 respondents who did not continue diet control, their main factors were lack of motivation (33.8%), followed by study schedule (24.3%) and lack of time (21.6%) respectively. Four students chose financial and did not suit their needs (5.4%) respectively as their main factors for not continuing diet control. Only three students chose lack of results

(4.1%) whereas two students chose too restrictive and other reasons such as laziness (2.7%) respectively as their main factors for not continuing diet control.

Figure 1 showed only 15 (32%) students continued physical activity while 32 (68%) students did not continue physical activity in post-resting study. Main factors for continuing physical activity in post-resting study were seen in Table 4. The top 3 reported factors for continuing physical activity in post-resting study were health (21.4%), having fun (21.4%) and feeling better (21.4%) respectively. A small proportion of students chose seeing results (14.3%) and good appearance (11.9%) respectively. Only three students chose friends whereas only one student chose praise or rewards as their main factor for continuing physical activity. Table 5 showed main factors for not continuing physical activity in post-resting study among 33 respondents were lack of motivation (38.5%), followed by lack of time (29.2%) and study schedule (23.1%) respectively. Two students chose financial and lack of results (3.1%) as their main factors for not continuing physical activity. Only one student chose did not suit needs and other as the main reason for not continuing physical activity.

Table 10 showed there was a significant difference ($p < 0.05$) observed in FBG level after completing 10 weeks of non-pharmacological approaches. However, Table 6 and 8 showed there were no significant changes in BMI and TC after completing 10 weeks of non-pharmacological approaches. Besides that, Table 7, 9 and 11 showed no significant differences were observed in BMI, TC and FBG between post and post-resting study.

DISCUSSION

After implementing a non-pharmacological approach for a duration of 10 weeks, there was a small decrease in the average body mass index (BMI) from 23.41 kg/m^2 to 23.13 kg/m^2. A slight increase in proportion of pharmacy students who were in normal BMI category (49%) and a slight decrease in percentage of students who were in overweight category (17%) respectively after completing 10 weeks of non-pharmacological approach due to students who might want to control their weight by controlling their diet and conducting physical activity to lose their weight. No respondents in underweight were able to manage to go into normal category due to all students in this category were female who might want to control their weight to prevent weight gain. At the same time, no respondents in obese category were able to manage to go into normal BMI or overweight category due to physical activity conducted might not be vigorous enough to lose weight or their diet were not well controlled. Although mean BMI in post-resting study was lower than that in post study, there was a slight decrease in percentage of students in normal BMI category and an increase in proportion of students in obese category in post-resting study which might be due to some participants gained weight as they did not carry out non-pharmacological approach in post-resting study.

There was a slight increase in proportion of pharmacy students (79%) who showed normal TC level and a decrease in proportion of borderline TC levels (17%) in post study which might be due to participants aware about their TC level by controlling their diets and conducting physical activity regularly during non-pharmacological approach period. No change in percentage of participants who had high TC level might be due to some respondents did not controlling their diet and conducting physical activity regularly although they knew their TC levels were higher than normal range. There was a slight reduction in mean TC from 4.73 mmol/L to 4.6 mmol/L after completing 10 weeks of non-pharmacological approach. Although mean TC in post-resting study was lower than that in post study, results of post-resting study showed an increase in percentage of students who had high TC level as compared to post study (4%) which might be due to participants did not carry out non-pharmacological approach in post-resting study. They might eat foods high in fat content more frequently as they did not control their diet in post-resting study. Besides that, they did not conduct physical activity regularly in post-resting study.

In pre study, only one participant had low FBG which might be due to the participant being in underweight category or fasting too long before measurement of FBG. An increase in impaired fasting glucose proportion observed in post study might be due to the participants did not conduct non-pharmacological approach as instructed in Sport Pharmacy course as these were self-conducted by respondents. There was a slight decreased in impaired fasting glucose percentage in post-resting study as compared to post study (6%) but one respondent showed high FBG as not observed before in pre and post study which might be due to participant did not carry out non-pharmacological approach in post-resting study. A slight decrease in pharmacy students' mean FBG (5.12 mmol/L to 5.09 mmol/L) was observed from pre to post study. However, mean FBG was increased in post-resting study which might be due to respondents ate foods high in sugar content more frequently as they did not control their diet in post-resting study. Besides that, they did not conduct physical activity regularly in post-resting study. Due to these reasons, an increase in mean FBG was observed in post-resting study.

After a duration of 10 weeks, the implementation of non-pharmacological methods resulted in a notable alteration in the fasting blood glucose (FBG) level. However, no substantial variance was observed in the body mass index (BMI) and total cholesterol (TC) levels. Moreover, no significant differences were seen in BMI, FBG and TC between post and post-resting study due to most of students did not continue non-pharmacological approaches in post-resting study. In neither the diet and physical activity group nor the diet with delayed physical activity group did Goodpaster et al. (2010) find any significant change in FBG and TC after a one-year intervention.[8] However, findings of present study were contrasted to this study who reported a significant difference in body weight and BMI after 1 and 2 years of diet and physical activity interventions.[8] This study concluded that addition of physical activity, regardless of whether initiated early in the program or delayed, promoted greater weight loss and reduction in BMI.[8] Similarly, Mensink et al. (2003) also reported a significant differences in BMI between the intervention group and control group after 1 and 2 years due to changes in body weight.[14] However, this study reported no significant change observed in TC level between lifestyle intervention and control groups after one and two years of lifestyle intervention which was like the findings of the present study although a slight increase in TC was observed over time in both groups.[14] In contrast, Zhang et al. (2017) found that lifestyle interventions which included physical activity, diet, and behavioral modification, could significantly improve lipid profiles, including TC.[33] From the study, they reported that combined physical activity and diet strategy had the strongest effect on improving CVD profiles compared to diet intervention alone or physical activity alone.[33] Post tests of previous studies were conducted immediately after combined diet and physical activity intervention. There were no resting periods in these studies which could be used to compare post-resting results of the present study.

Only 23% of participants continued diet control and 32% of participants continued physical activity in post-resting study. Al-Naggar et al. (2013) found that more than half of the Malaysian university students were physically inactive (53.7%).[17] The percentage of students reporting practicing physical activity in this study was contrasted to that observed in previous studies.[9,11,21] The percentage of practicing diet control was lower as compared to Yousif et al. (2019) who reported that nearly half of students did not control their diet (45.8%) whereas 28.7% controlled their diet and 25.5% were emotional eaters.[32] Low percentage of students continued physical activity and diet control reflects insufficient healthy lifestyle practice among university students although they had practiced physical activity and diet control in Sport Pharmacy course.[11] Being a student in the health university college was found to be associated with a high risk of physical inactivity.[2] Heavy academic study was one of the barriers for university China students to participate in physical activity.[30]

Among students who continued diet control in post-resting study, the main factors for continuing diet control were health (34.8%), followed by seeing results (30.4%) and feeling better (26.1%). Only a small proportion of students chose friends and praise or rewards (4.3%) respectively. This coincides with a study conducted by Tok et al. (2018) reported that main reason for practicing diet control in both males and females were health (43.4% and 31.4% respectively).[23] The present study showed that health, having fun and feeling better were the main three factors for continuing physical activity in post-resting study. Only minority of students chose seeing results, good appearance, friends and praise or rewards as their main factors for continuing physical activity respectively. According to Driskell et al. (2005), a study found that health, enjoying themselves, and wanting to lose weight were three factors that impacted students' habits regarding physical activity.[6] A study conducted by Romagueral et al. (2011) on Spanish university students found that most students did physical activity in order to keep themselves fit, healthy, enjoyment and social interaction (with their friends).[21] The present study noted as participants in this study were pharmacy students who had good knowledge about health and knew that diet control and physical activity were examples of the non-pharmacological approach that could maintain their health. This might be explained by the fact that students chose health, seeing results and feeling better as main factors for continuing non-pharmacological approach in post-resting study.

For students who did not practice diet control and physical activity in post-resting study, the main factors for not practicing diet control were lack of motivation followed by study schedule and lack of time respectively. A minority of students chose other reasons such as financial, did not suit their needs, lack of results, too restrictive and others such as laziness as main factors for discontinuing diet control and physical activity in post-resting study. This coincides with a study conducted in Saudi Arabia by Majeed et al. (2015) who found that the main barriers to diet control were lack of time, followed by lack of access to healthy foods and taste preferences.[12] Similar finding was reported by Silliman et al. (2004) that the most common barriers cited to practice diet control were lack of time followed by lack of money and taste preferences.[22] Daskapan et al. (2006) reported that the most important barrier for not participating in physical activity among Turkish university students was lack of time due to busy study schedule followed by parent, social and family responsibilities and lack of energy.[5] Similarly, barriers to physical activity among Egypt students reported by El-Gilany et al. (2011) included time limitation, lack of friends to encourage them, lack of motivation, financial issue.[7] Awadalla et al. (2014) reported that more than half of students chose personal factors as significant barriers of not practicing physical activity such as time limitation (51.3%).[2] In this study, only 19.6% chose lack of motivation as their significant barrier of not practicing physical activity which was much lower as compared to present study.[2]

The present study noted as final year pharmacy students, were busy in their studies and had little time for diet control and physical activity. This might be explained by the fact that students chose study schedule and lack of time as main barriers for diet control and physical activity. Busy study schedule and lack of time might cause them to not be motivated in practicing non-pharmacological approach in their daily lives. They had more priority on their academic than on diet control and physical activity. Another reason for students not practicing diet control might be due to the wide availability of local traditional cuisine and snacks such as *nasi lemak*, curry and *roti canai* at cafeterias on campus. The emergence of fast-food outlets around the campus area and the convenience of transportation system are believed to be the contributing factors for not practicing diet control.[18]

Study Limitations

In this study, respondents might have underestimated their caloric intake or exaggerated the amount of exercise based on response bias as respondents were self-conducted and self-

reported their physical activity and diet intake in their weekly report.[4] No monitoring of non-pharmacological approach conducted by respondents in pre, post and post-resting study. Secondly, the study subjects consisted of mostly female subjects which might contribute to the bias in the results of the present study. Thirdly, the method of measuring health parameters might influence outcome.[4] Based on Malaysia CPG guidelines on Management of Type 2 Diabetes Mellitus 2015, FBG should be measured based on venous blood samples instead of capillary blood samples.[15] This might affect the accuracy of FBG results. Fourthly, incomplete weekly reports submitted by most respondents resulted in measurement of food calories per week could not be analysed for diet control in this study. Fifthly, equipment used in the study such as blood glucose meter and weighing balance had not been validated. This could affect the validity of the results in the study.

CONCLUSION

Significant results for FBG were achieved through a non-pharmacological approach consisting of physical activity and diet control conducted over the course of ten weeks. However, there was no notable influence on BMI or TC. The post-resting phase failed to produce significant alterations in BMI, FBG, and TC due to the minority who continued non-pharmacological practices in their daily routine. Barrier identification revealed a lack of motivation, insufficient time, and conflicts with study schedules as hindrances to maintaining non-pharmacological methods among pharmacy students. Long-term follow-up studies should be conducted to confirm whether pharmacy students continue practising NPA and benefits of these are maintained after course ceases. University plays an important role in improving the compliance of non-pharmacological approach among pharmacy students by reviewing practical assessment of the course to motivate and encourage pharmacy students in practicing non-pharmacological approach in their daily lives. Creating environments that are conducive to change for healthy habits is also important in the university context. Pharmacists should be able to discuss the health benefits of exercise and practical skills in patient counselling should be practised to encourage appropriate self-care and dispensing of self-care advice to patients. Maintaining normal health parameters among pharmacy students is important as they are professional students which need to provide pharmaceutical care and patient education to the public. Periodic monitoring through a continuous survey of students' physical and dietary lifestyles is a wise move for improving their status.

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Table 1. Comparison of pre, post and post-resting health parameters.							
		Pre		**Post**		**Post-Resting**	
N		47		47		47	
Health Parameters	**Category**	**N (%)**	**Mean (SD)**	**N (%)**	**Mean (SD)**	**N (%)**	**Mean (SD)**
Body Mass Index (BMI)	**Underweight**	6 (13)	23.41 (4.99)	6 (13)	23.13 (4.75)	6 (13)	22.91 (4.83)
	Normal	22 (47)		22 (49)		22 (47)	
	Overweight	9 (19)		8 (17)		8 (17)	
	Obese	10 (21)		11 (21)		11 (23)	
Total Cholesterol (TC)	**Normal**	33 (70)	4.73 (0.81)	37 (79)	4.6 (0.66)	37 (79)	4.35 (1.22)
	Borderline High	12 (26)		8 (17)		4 (9)	
	High	2 (4)		2 (4)		6 (13)	
Fasting Blood Glucose (FBG)	**Low**	1 (2)	5.12 (0.05)	0 (0)	5.09 (0.48)	0 (0)	5.45 (0.52)
	Normal	46 (98)		44 (94)		44 (94)	
	Impaired FBG	0 (0)		3 (6)		2 (4)	

11

| | **High** | 0 (0) | | 0 (0) | | 1 (2) | |

N = number; SD = standard deviation.

Table 2. Factors for continuing diet control		
Factors for Continuing Diet Control	**Responses**	
	N	**%**
Health	8	34.8%
Friends	1	4.3%
Seeing Results (Getting fitter and healthier)	7	30.4%
Feeling Better	6	26.1%
Praise/Rewards	1	4.3%
Total	23	100.0%
N = number; % = percentage.		

Table 3. Factors for not continuing diet control.		
Factors for Not Continuing Diet Control	**Responses**	
	N	**%**
Lack of Time	16	21.6%

	N	%
Lack of Motivation	25	33.8%
Study Schedule	18	24.3%
Financial	4	5.4%
Lack of Results	3	4.1%
Didn't Suit Needs	4	5.4%
Too Restrictive	2	2.7%
Other	2	2.7%
Total	74	100.0%
N = number; % = percentage.		

Table 4. Factors for continuing physical activity.		
Factors for Continuing Physical Activity	**Responses**	
	N	**%**
Appearance	5	11.9%
Friends	3	7.1%
Health	9	21.4%
Having Fun	9	21.4%
Seeing Results	6	14.3%
Praise/Rewards	1	2.4%
Feeling Better	9	21.4%
Total	42	100.0%

N = number; % = percentage.

Table 5. Factors for not continuing physical activity.

Factors for Not Continuing Physical Activity	Responses	
	N	**%**
Lack of Time	19	29.2%
Lack of Motivation	25	38.5%
Study Schedule	15	23.1%
Financial	2	3.1%
Lack of Results	2	3.1%
Didn't Suit Needs	1	1.5%
Other	1	1.5%
Total	65	100.0%

N = number; % = percentage.

Table 6. Comparison of the BMI between pre and post study among Sport Pharmacy students.

Health parameters	n	Difference of Pre and Post Median (IQR)	Z	P-value[a]
BMI	47	0 (0)	- 1.732	0.083
[a] Wilcoxon Signed Ranks Test				

Table 7. Comparison of the BMI between post and post-resting study among Sport Pharmacy students.

Health parameters	n	Difference of Post and Post-resting Median (IQR)	Z	P-value[a]
BMI	47	0 (0)	- 1.63	0.102
[a] Wilcoxon Signed Ranks Test				

Table 8. Comparison of the TC between pre and post study among Sport Pharmacy students.

Health parameters	n	Difference of Pre and Post Mean (SD)	t(df)	P-value[a]
TC	47	0.085 (0.62)	0.94 (46)	0.351

[a] Paired t-test

Table 9. Comparison of the TC between post and post-resting study among Sport Pharmacy students.

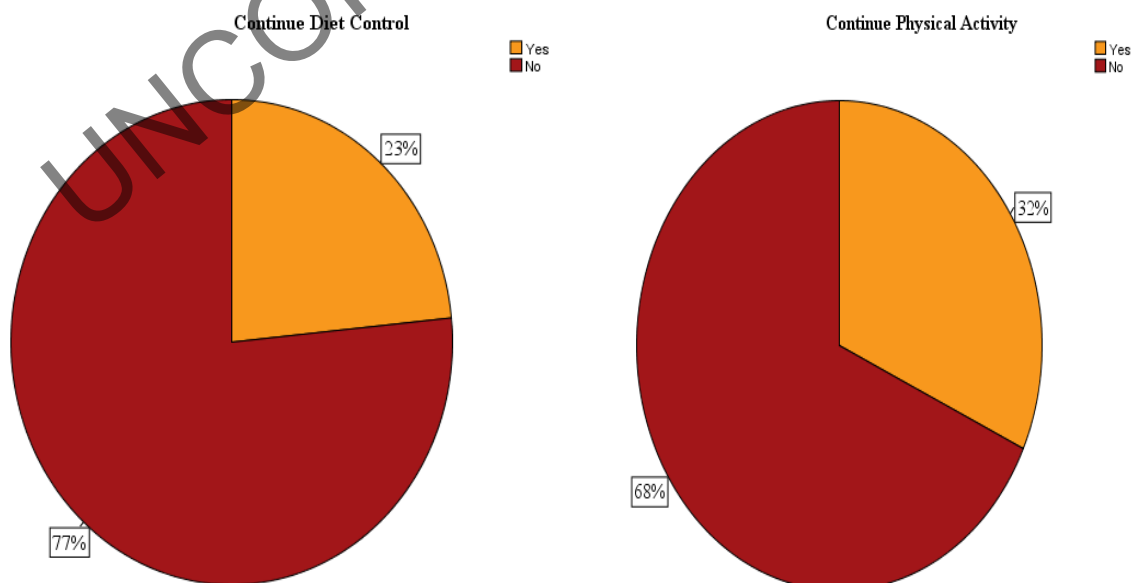| Health parameters	n	Difference of Post and Post-resting Median (IQR)	Z	P-value[a]
TC	47	0 (0)	- 0.85	0.396

[a] Wilcoxon Signed Ranks Test

Table 10. Comparison of the FBG between pre and post study among Sport Pharmacy students.

Health parameters	n	Difference of Pre and Post Median (IQR)	Z	P-value[a]

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FBG	47	0 (0)	- 2.00	0.046

ª Wilcoxon Signed Ranks Test

Table 11. Comparison of the FBG between post and post-resting study among Sport Pharmacy students.

Health parameters	n	Difference of Post and Post-resting Median (IQR)	Z	P-valueª
FBG	47	0 (0)	- 0.33	0.739

ª Wilcoxon Signed Ranks Test

Continue Diet Control
- Yes
- No

23%
77%

Continue Physical Activity
- Yes
- No

32%
68%

(**a**)   (**b**)

Figure 1. (a) 23% of Year 4 Pharmacy students continued diet control in post-resting study. Most of Year 4 Pharmacy students (77%) did not continue diet control in post-resting study. (b) Only 32% of Year 4 Pharmacy students continued physical activity in post-resting study. Most of Year 4 Pharmacy students (68%) did not continue physical activity in post-resting study.