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Short Communication

Can social media intervention improve physical activity of medical students?

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ABSTRACT

Objectives: Physical activity level decreases during young adulthood. As social media are nowadays widely used and are included into many people's daily routines, the interventions on these websites have the possibilities to be integrated into those routines without becoming a burden. The aim of this study was to assess physical activity level among first- and fifth-year medical students and social media intervention with the aim to improve physical activity among them.

Study design: Prospective longitudinal study was conducted during October of 2016 at the Faculty of Medicine, University of Belgrade, Serbia. The study included 375 first- and fifth-year students.

Methods: At the baseline, students filled in the questionnaire and were asked to join a Facebook discussion group. The intervention consisted of motivation for physical activity through motivational pictures, texts, and discussions. The second assessment was carried out after one month. Based on the reported physical activity level, students were divided into groups: sufficient (>600 metabolic equivalent [MET]-minutes/week) and insufficient physical activity (≤600 MET-minutes/week).

Results: Total of 85.4% of students were sufficiently active at the baseline, whereas 90.4% were sufficiently active after one month. Multivariate logistic regression analysis showed that students who were part of the Facebook group (odds ratio [OR]: 3.51, 95% confidence interval [CI]: 1.46–8.43) and students who had sufficient physical activity at the baseline (OR: 5.44, 95% CI: 2.44–12.13) had a higher likelihood to be sufficiently active after one month.

Conclusion: Social media are shown to be valuable in health-promoting interventions and can be used for interventions targeting lifestyle change among young adults.

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Introduction

The World Health Organization (WHO) recommends a minimum of 150 min of physical activity (PA) of moderate or 75 min of vigorous intensity per week.[1] Medical students, as the future health professionals, are familiar with the benefits of PA and recommendations, but theoretical knowledge is rarely accompanied with a healthy lifestyle.[2] A study conducted among students of physical therapy, midwifery, nursing, cosmetology and medicine in Poland showed that the medical students had the highest prevalence of low-level PA, as high as 26%.[3] Physically active doctors are more likely to advise patients about PA and give more detailed instructions on the type, frequency and intensity of PA.[4]

Behavioural change and lifestyle improvement can be encouraged through social media, as they are widely accessible and many people use them daily.[5] The interventions on social media have the possibilities to be integrated into daily routines without becoming a burden.[5] They can create social support, which facilitates engagement.[6] People who are part of the same Facebook discussion group can comment on others' photos or posts along with posting their own. One of the recommended approaches is a hybrid approach, where both health promotion messages, which have a strong influence on fast improvement of lifestyle but which attenuates over time, and reports on peers' progress, which can have more lasting influence, are used.[7]

Methods

We designed the study to assess PA level among first- and fifth-year medical students and social media intervention with aim to improve PA among them.

The study, designed as a quasi-experiment, was conducted during October 2016, at the Medical Faculty, University of Belgrade. We compared the PA of the students included in the specially designed Facebook group and students who were not. The total of 878 first- and fifth-year students filled in the initial questionnaire. In the intervention group, there were 705 students who joined the Facebook group, and 173 who did not formed the control group. The intervention lasted for one month, and after that, there were 311 students who were part of the Facebook group (intervention group) and 64 who were not (control group). The final analysis included 375 students. There were no significant differences in the attrition rates between the intervention and control group ($P = 0.306$). The final sample was representative of the entire population as there were no differences in gender ($P = 0.07$), body mass index (BMI) level ($P = 0.844$) and baseline PA ($P = 0.936$) between the samples.

The research instrument was a questionnaire, modified and translated into Serbian in three stages (backward translation, forward translation and pretesting). Test-retest reliability was assessed on 20 students (kappa $\geq$0.90). The questionnaire, designed as an online questionnaire on Google platform, consisted of 77 questions in eight sections: social characteristics (gender, age, place of residence, self-perceived socio-economic status, transportation, commuting time); current PA level (International PA Questionnaire);[8] satisfaction with current PA; desired PA level; preferred form of PA; self-rated well-being; health status, mental health (Patient Health Questionnaire- 2, PHQ-2[9]) and family health history; and lifestyle characteristics.

At the baseline level, all students filled in the questionnaire and anthropometric measures were recorded: height, weight and waist circumference. Students were then offered to join a specially designed Facebook group. The second measurement was performed after one month, and students filled in the questionnaire on PA once more. The Facebook group, specially designed for purposes of intervention, was administered by the research team. It used a participatory approach, and all members were allowed to post motivational messages or questions for their peers, along with posts from the research team. The reports and photos from organized events (running, walking, ice-skating) were also posted regularly, so all participants could follow the level of participation of other students. The research team shared information on free sports activities for students in multiple sports centres in Belgrade, special discount for the students included in the study which was available in the sports centre nearby the Medical Faculty.

As an indicator of PA, metabolic equivalents (METs) were used.

Total energy expenditure was calculated as follows:

MET/week = $\sum$METS in high-intensity PA + METS in moderate intensity PA + METs in low-intensity PA.

Energy expenditure for each level of PA was calculated using the following formula:

MET/week = number of days with PA*duration in minutes*k.

k for high-intensity PA = 8; k for moderate intensity PA = 4; k for walking = 3.3.

Based on energy expenditure, students were then classified in two groups, according to recommendations by the WHO,[1] sufficient PA (>600 MET-minutes/week) and insufficient PA ($\leq$600 MET-minutes/week). Based on the score on PHQ-2, mental health was assessed as good (PHQ$\leq$2) or not good (PHQ>2).

A total of 15 variables were included in the analysis: gender, year of study, relationship status, baseline PA, BMI level, type of transportation, average commute time, self-perceived financial status, self-rated health, mental health, smoking status, use of cannabis in the past 12 months, non-prescription anxiety medication use and preferred activity.

Students were informed about the purpose of the research. Participation was voluntary and anonymous. The ethical committee of Belgrade Medical Faculty approved the research (No29/IX-7).

Chi-squared test and *t*-test were used to assess differences between students with sufficient and insufficient levels of PA regarding social, anthropometric, health and lifestyle characteristics. All variables which were significant ($P < 0.05$) were entered into a multivariate regression model (including odds ratio and 95% confidence interval) with sufficient PA as an outcome variable. The IBM SPSS Statistics 22.0 package was used for these analyses.

Results

This intervention included 375 students, 231 (61.6%) fifth-year and 144 (38.4%) first-year students. A total of 311 students (82.9%) were included in the Facebook group. Sufficiently physically active at the baseline was 85.4% and after one month was 90.4% of students. Characteristics of sufficiently active and insufficiently active students are presented in Table 1.

Multivariate logistic regression analysis showed that students who were active on a baseline measurement had 5.44 times higher odds to be sufficiently active at one-month measurement and those who were in the Facebook group had 3.51 times higher likelihood to be sufficiently active after one month (Table 1).

Table 1 – Characteristics of students included in the research and multivariate analysis with sufficient physical activity as an outcome variable.

Characteristics	Total [N (%)]	Sufficiently active [N (%)]	Insufficiently active [N (%)]	P-value	Multivariate analysis [OR (95% CI)]
Gender					
Male	101 (27.0)	94 (93.1)	7 (6.9)		/
Female	273 (73.0)	244 (89.4)	29 (10.6)	0.282	/
Year of study					
First	231 (61.6)	203 (87.9)	28 (12.1)		1.0 ref. category
Fifth	114 (38.4)	136 (94.4)	8 (5.6)	0.036	2.36 (0.996–5.58)
Relationship status					
Single	213 (57.0)	188 (88.3)	25 (11.7)		/
In a relationship	161 (43.0)	150 (93.2)	11 (6.8)	0.111	/
Baseline physical activity					
Sufficient	317 (85.4)	296 (93.4)	21 (6.6)		**5.44 (2.44–12.13)**
Insufficient	54 (14.6)	40 (74.1)	14 (25.9)	<0.001	1.0 ref. category
Member of the Facebook group					
Yes	311 (82.9)	286 (92.0)	25 (8.0)		**3.51 (1.46–8.43)**
No	64 (17.1)	53 (82.8)	11 (17.2)	0.024	1.0 ref. category
BMI level					
Undernourished	27 (7.2)	26 (7.7)	1 (2.8)		/
Normal	281 (75.1)	251 (74.3)	30 (83.3)		/
Overweight	59 (15.8)	54 (16.0)	5 (13.9)		/
Obese	7 (1.9)	7 (2.1)	0 (0)	0.516	/
Type of transportation					
Active	80 (21.3)	70 (87.5)	10 (12.5)		/
Passive	295 (78.7)	269 (91.2)	26 (8.8)	0.321	/
Average commute time in minutes (mean +/− standard deviation)	29.11 ± 19.51	30.83 ± 24.04	28.17 ± 18.12	0.519	/
Self-perceived financial status					
Poor	68 (18.5)	65 (95.6)	3 (4.4)		/
Average	129 (35.1)	115 (89.1)	14 (10.9)		/
Good	170 (46.3)	153 (90.0)	17 (10.0)	0.301	/
Self-rated health					
Poor	7 (1.9)	6 (85.7)	1 (14.3)		/
Average	46 (12.3)	45 (97.8)	1 (2.2)		/
Good	322 (85.9)	288 (89.4)	34 (10.6)	0.179	/
Mental health					
Good	329 (87.7)	298 (90.6)	31 (9.4)		/
Not good	46 (12.3)	41 (89.1)	5 (10.9)	0.755	/
Smoking status					
Smoker	78 (20.8)	72 (92.3)	6 (7.7)		/
Ex-smoker/non-smoker	297 (79.2)	267 (89.9)	30 (10.1)	0.520	/
Past year cannabis use					
Yes	43 (11.5)	298 (89.8)	34 (10.2)		/
No	332 (88.5)	41 (95.3)	2 (4.7)	0.242	/
Non-prescription anxiety medication use					
Yes	49 (13.1)	43 (87.8)	6 (12.2)		/
No	326 (86.9)	296 (90.8)	30 (9.2)	0.500	/
Preferred activity					
None	4 (1.1)	4 (100)	0 (0)		/
Aerobic	275 (73.3)	248 (90.2)	27 (9.8)		/
Strength	20 (5.3)	19 (95.0)	1 (5.0)		/
Aerobic and strength	76 (20.3)	68 (89.5)	8 (10.5)	0.801	/

Bold values represents p<0.001.
OR, odds ratio; CI, confidence interval.

Discussion

This study examined the influence of social media–based intervention on the improvement of PA of medical students. We used a short time frame to research the possibilities for fast and simple PA interventions. Although our study had an attrition rate of 57.3%, the final sample was representative of the population of medical students, as it did not differ from the initial population significantly. The baseline prevalence of sufficient PA was 85.4%, whereas the prevalence of sufficient PA after one month was 90.4%, which was higher than reported among United States physicians, residents and medical students (78%).[10] Our study showed that students who were sufficiently active before the intervention had 5.4 times higher likelihood to be sufficiently active after one month. This is understandable, as it was expected that students who were active at the beginning remain active. Students who were included into the Facebook group had a 3.5 times higher likelihood for sufficient PA at the end of the intervention. This might be because our intervention used a hybrid approach, as suggested by Zhang et al.[7] This approach was suggested as possibly most effective for improvement of PA, as a strong health promotion campaign seems to improve PA quickly, but its effects attenuate over time. Peers' influence does not improve PA as quickly but has longer positive effects.[7] People are more likely to accept some behaviour if they knew someone who has the same behaviour or some of their friends' friends adopted it. Our students were strongly engaged in posts from sports events in which their peers participated, for example, amateur running events in Belgrade.

The specially designed Facebook group creates the feel of social support, proven to be the strongest predictor of PA among adults,[5] which allows an increase in the prevalence of adoption of healthy behaviour. Although it was shown that Facebook intervention does not influence the participation in PA anymore that does an educational intervention,[11] the study reporting this had different methodological approach compared with ours, as they used both Facebook group for social support and specially designed website for health-promoting materials. On the contrary, we posted all materials on Facebook, and our participants were exposed to daily health-promoting messages.

This study has a few limitations. The first is its short follow-up period, which is not enough to allow the examination of effects of social media interventions on adherence to healthy lifestyle in longer time periods. Another was the method of participants' recruitment, as there was no randomization into the intervention and control groups, and participation was voluntary. This was the first interventional study conducted in Serbia aimed at improving health behaviour. This study had a prospective design and allowed the possibility for follow-up of the participants and is one of the first studies to examine the short-term effects of the participatory approach in the intervention on improvement of PA among young adults.

The social media intervention aimed at increase of PA seems to be promising. There is a need for further research to assess the long-term effects of such interventions.

Author statements

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Ethical approval

The ethical committee of Belgrade Medical Faculty approved the research (No29/IX-7).

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Competing interests

None declared.

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