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Physical activity information-seeking behaviour and barriers in a sample of university undergraduate emerging adults: a cross-sectional survey

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Abstract

Background Access to physical activity information provides opportunities for enduring and relevant messaging regarding physical activity. This may be a potential vehicle to optimise physical activity participation among emerging adults. This study aimed to characterise the physical activity information-seeking behaviour in a sample of university undergraduate emerging adults.

Methods Five hundred and seventy-five undergraduate students (age = 21.7 ± 1.9 years) participated in the study. Respondents' physical activity information-seeking behaviour was obtained using an adapted instrument, while physical activity and barriers were assessed using the International Physical Activity Questionnaire and the Exercise Benefits and Barrier Scale.

Results Three hundred and fifty-one respondents (61%) of respondents sought physical activity information. The majority of these individuals (73.8%) sought physical activity information using social media. After identifying and controlling for confounders including engaging in physical activity programmes and faculty of study, having low physical activity levels was associated with a < 1 likelihood of seeking physical activity information compared to having high physical activity levels (odds ratio = 0.5, 95% confidence interval 0.27–0.87; $p = 0.015$). However, there was no association between barriers to physical activity and physical activity information-seeking behaviour (odds ratio = 1.17, 95% confidence interval 0.81–1.69; $p = 0.40$).

Conclusion Undergraduate emerging adults seek physical activity information using social media to enhance their physical appearance and health.

Keywords Health Information Seeking, Physical activity, Young Adults, University Undergraduate Students, Nigeria

Background

Health information-seeking behaviour is the conscientious search for diverse information about one's health and/or diseases [1]. When individuals engage in health information-seeking behaviour, they have a myriad of accessible and cost-effective health information at their disposal [2]. Health information-seeking spans across different age groups, including adolescents, emerging adults (transition between adolescence and adulthood),

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adults, and older adults. As health behaviours developed during the stage of emerging adulthood persists into adulthood [3], it is imperative to understand health information-seeking behaviour among emerging adults on a wide range of health topics. One such topic is physical activity.

Physical activity is any bodily movement produced by skeletal muscles that requires energy expenditure [4]. Physical activity ranges from leisure, play, and house chores to daily work [4]. The benefits of being physically active in the emerging adult population are replete in the literature. These include increased academic performance, increased retention, and lower depressive symptoms [5]. Other benefits of physical activity include enhanced thinking, learning, and judgment skills, improved self-esteem and body image, and enhanced social relatedness [5]. Although not a major concern among emerging adults, physical activity helps to prevent and manage non-communicable diseases [5]. However, emerging adults do not engage in sufficient physical activity. Physical inactivity among emerging adults has been attributed to several barriers, including a low level of knowledge about physical activity, low motivation, other competing interests, fatigue, and concerns regarding the social desirability of physical activity [6].

Access to physical activity information provides opportunities for enduring and relevant messaging of physical activity. Having access to physical activity information may be a potential vehicle for increasing uptake, fostering adherence, and optimising physical activity participation in this population [7]. Thus, expanding the understanding of emerging adults' preference for physical activity information may help implement relevant physical activity-enhancing topics while considering their preferred sources [7]. Previous studies have investigated why emerging adults seek physical activity information and the sources where they seek such information [7–9]. However, most of these studies focussed on fitness and exercise and not physical activity. Individuals with adequate information about healthy behaviour are likely to engage in such behaviour while perceiving few barriers [10]. Thus it is imperative to explore whether there is an association between physical activity information-seeking behaviour, physical activity, and barriers to physical activity among emerging adults. This study, therefore, aimed to investigate whether undergraduate emerging adults in Nigeria seek information about physical activity, the reasons for seeking and the preferred source of such information. Equally, this study aimed to determine associations between physical activity information-seeking behaviour, physical activity, and barriers to physical activity among undergraduate emerging adults.

Methods

Participants

The study was a cross-sectional study. Respondents were consenting male and female university undergraduate emerging adults (18–25 years old), who were in their second year of study or above and whose mode of study was full-time. First-year students who were not within the 18–25-year bracket and were not domiciled within the University environment were excluded from the study. Using the CheckMarket® online sample size calculator [5% margin of error, a confidence interval of 95%, and an estimated response rate of 80%], a sample size of 382 participants was found to be adequate for this study. Participants were recruited using a convenient sample.

Protocol

The International Physical Activity Questionnaire short form (see Additional file 1, Sect. 2) was self-administered to respondents to assess their physical activity levels. It is a 10-item questionnaire that can be self-administered or interviewer-administered [11]. Respondents indicated the duration and frequency of engaging in vigorous, moderate, walking, and sitting activities over the last 7 days. The physical activity levels of respondents were classified as being low, moderate, and vigorous following stipulated guidelines [11].

Physical activity information-seeking behaviour questionnaire adapted from a previous study [7] was used to assess respondents' information-seeking behaviour (see Additional file 1, Sect. 3). Twelve items (social media, websites/blogs, video channels such as YouTube, friends, families, health professionals, fitness professionals, online magazines, print magazines, television programs, online newspapers, and other sources not listed here) were used to elicit information on the sources where respondents seek physical activity information. Five items (health, appearance, sports performance, general exercise, and others) were used to assess why respondents sought physical activity information. Respondents were asked if they engage in any healthy group-based physical activity programme (football, aerobic classes, dance clubs, karate, basketball, volleyball, and weightlifting). The face and content validity of the physical activity information-seeking behaviour questionnaire was determined by an expert in physical activity, epidemiological studies, and a skilled statistician.

Barriers to physical activity of respondents were assessed using the barrier subscale of the exercise benefits and barriers scale [12]. It comprised 14 items rated on a 4-point Likert scale (see Additional file 1, Sect. 4). The exercise benefits and barriers scale has been reported to have excellent test–retest reliability and internal consistency. The scores of this subscale range between 14 and

56; a lower score denotes fewer barriers to physical activity. Respondents' socio-economic status was assessed using a 9-rung self-rating socio-economic status ladder [13]. The scores of the rungs of the ladder were rated in multiples of 3, with the minimum and maximum possible scores of 3 and 27, respectively. Respondents were classified to be in a low (<9), middle (9–18), or high (>18) socio-economic status strata based on summative scores. All of the pen and paper instruments were administered in English language. Body mass Index of respondents was obtained by dividing their weight in Kg by height in square metres.

A proforma was used to document respondents' socio-demographic information, weight, and height (see Additional file 1, Sect. 1). This research was carried out fully in consonance with the ethical standards of the Helsinki Statement [14]. Informed consent of respondents was sought before study participation. Questionnaires were distributed to consenting participants during the general assembly organised by the student body (From August to October 2021). Research instruments were administered to consenting respondents. Questionnaires were distributed by hand to limit non-compliance by the students. Respondents were encouraged to fill out the questionnaires as truthful as possible. The questionnaires were without identity, and the questionnaires were given to participants to fill alone after proper explanation to avoid social desirability bias. The questionnaires were self-administered, immediately retrieved, and kept for analysis. As recommended by Jacobsen and Jensen [15], two steps were taken to address potential sources of bias. Firstly, the questionnaires were distinctly organised to ensure that respondents did not carry over their understanding of one scale to another while answering questions. Secondly, exploratory factor analysis was used to assess the factor structures of the perceived barriers to physical activity scale and the International Physical Activity Questionnaire Short Form. The exploratory factor analysis with varimax rotation on each scale was expected to produce a factor solution of at least two factors. This expectation was met as each scale produced more than 2 factors as shown as follows: barriers to physical activity (4 factors; total variance 60%); International Physical Activity Questionnaire Short Form (3 factors; 66%), Thus, common methods bias was minimal.

Statistical analysis

Data were analysed using IBM for Window Statistical Package for Social Science version 25 (Armonk, NY, IBM Corp.). Descriptive Statistics of frequency and mean were used to summarise categorical and continuous data, respectively. As recommended in the literature [16], median scores were used as the cutoff points for age

(<23 years, >23 years) and barriers to physical activity (low, high barriers). Previously, covariates including age, gender, body mass index, faculty of study, and participation in physical activity programs have been reported to affect the pattern of health-related behaviours including physical activity [17, 18]. The predictor variables (barriers to physical activity and physical activity), and potential covariates were entered into a logistic model using a forced entry method. A second regression analysis was conducted to investigate the association between predictors—physical activity level and barriers to physical activity—and physical activity information-seeking behaviour, while controlling for the confounders identified in the first model. The level of significance was set at $p < 0.05$.

Results

Six hundred undergraduate students were surveyed; however, information from 25 respondents was excluded due to significant missing or incomplete datasets. Of the 575 respondents, 56.7% were females, and the average age was 21.7 ± 1.9 years. 66.3% of the respondents had normal weight, 10.8% were underweight, and 17.2% were overweight. The socio-demographic characteristics of respondents are presented in Table 1.

Three hundred and fifty-one respondents (61%) reported that they sought physical activity information. More males than females (66.3% vs 57.1%) sought physical activity information ($\chi^2, P=0.025$). Social media (73.8%) (Comprising WhatsApp, Facebook, Twitter, Instagram, and LinkedIn) was the most preferred source among those who sought physical activity information. This was followed by friends (41.8%) and family (22.9%) sources. When compared by gender, the same preference for social media (70.8% vs. 76.1%), friends (41.2% vs. 36.3%), and family (19.9% vs. 25.2%) were reported by male and female respondents, respectively.

Physical appearance (34.6%) was the most common reason undergraduate emerging adults sought physical activity information. Gender comparison showed that health maintenance (37.0%) was the most common reason males seek physical activity information; on the other hand, physical appearance (47.0%) was the main reason females seek physical activity information. The preferred sources of physical activity information and why undergraduate emerging adults seek physical activity information are presented in Table 2.

Seventy-six (13.2%) respondents reported having low physical activity levels while 334 (58.1%) and 165 (28.7%) respondents reported moderate and high levels of physical activity, respectively. Further, the mean barriers to physical activity score was 22.4 ± 0.1 . Three hundred and twenty respondents (55.7%) indicated that they participated in group-based physical activity

Table 1 General characteristics of respondents (N=575)

	N (%)
Age (years)	
< 23 years	380 (66.1)
> 23 years	195 (33.9)
Gender	
Male	249 (43.3)
Female	326 (56.7)
Faculty	
Arts	75 (13.0)
Basic Medical Sciences	100 (17.5)
Education	75 (13.0)
Engineering	75 (13.0)
Law	100 (17.5)
Physical Sciences	75 (13.0)
Social Sciences	75 (13.0)
Level	
200	175 (30.4)
300	175 (30.4)
400	150 (26.2)
500	75 (13.0)
Socioeconomic status	
Low	52 (9.1)
Middle	428 (74.4)
High	95 (16.5)
Marital status	
Married	9 (1.6)
Single	566 (98.4)

programs. Football playing (54.7%), followed by dance clubs (30.6%) and aerobic classes (24.5%) were the most common group-based physical activity programs that the emerging adults in this study engaged in (N=294). When group-based physical activity participation was compared by gender, results show that males participated more in football (73.3%) while females participated more in dance clubs (72.2%).

The following barriers to physical activity were reported by undergraduate emerging adults surveyed, “tiredness” (56.7%), “fatigue from exercise” (47.5%), “exercise facilities not having convenient schedules” (46.8%) and “distant places to exercise” (41.4%). When compared by gender, “tiredness” (47.4%), “inconvenient schedules of exercise facilities” (44.2%), “fatigued by exercise” (40.6%), and “few places to exercise” (40.2%) were commonly cited by males. For females, “tiredness” (63.8), “fatigue by exercise” (52.8%), “inconvenient schedule for exercise” (48.8%), and the “distant places to exercise” (45.7%) were the most cited barriers.

Table 2 Preferred sources and reasons why undergraduate emerging adults seek PA information (N=351)

Preferred sources of physical activity information among respondents			
Source	Males N (%)	Females N (%)	Total N (%)
Friends	116 (49.2)	114 (36.3)	230 (41.8)
Family	47 (19.9)	79 (25.2)	126 (22.9)
Social media	167 (70.8)	239 (76.1)	406 (73.8)
Health practitioner	43 (18.2)	67 (21.3)	110 (20.0)
Fitness professionals	45 (19.1)	57 (18.2)	102 (18.5)
Online magazine/newspaper	34 (14.4)	47 (15.0)	81 (14.7)
Print material	10 (4.2)	6 (1.9)	16 (2.9)
Television	41 (17.4)	66 (21.0)	107 (19.5)
Internet video channels	22 (9.3)	18 (5.7)	40 (7.3)
Other sources	8 (3.4)	6 (1.9)	14 (2.5)
Reasons why undergraduate emerging adults attending university of Benin seek PA information ^a			
Reason	Males N (%)	Females N (%)	Total N (%)
Health	61 (37.0)	57 (30.8)	118 (33.7)
Appearance	34 (20.6)	87 (47.0)	121 (34.6)
Sport performance	37 (22.4)	11 (5.9)	48 (13.7)
General exercise	33 (20.0)	30 (16.2)	63 (18.0)

^a Respondents chose multiple options

The physical activity barriers faced by undergraduate emerging adults are presented in Table 3.

The first logistic model showed faculty of study and participation in physical activity programmes as covariates. In the second model, barriers to physical activity levels did not exhibit statistically significant association with physical activity information-seeking behavior (all *p* values > 0.05) (Table 4). However, respondents with low physical activity were 0.5 times less likely to seek physical activity information than those with high physical activity (*p* < 0.05).

Discussion

The high percentage of undergraduate emerging adults who sought physical activity information in the current study extends the findings of Ori and Berry [7]. In the latter study, 79.6% of the surveyed population sought physical activity information. As young undergraduate students seek information about their academic work, they also seek information to enhance their physical appearance and body build, as well as their social connectedness [19, 20]. Further, it is common practice for emerging adults to aspire to have a comparable body fit as their favourite celebrity role models; thus, getting exposed to information on physical activity as they seek information about their role models [21].

Table 3 Barriers to PA among undergraduate emerging adults (N = 575)

Barriers	Males N (%)	Females N (%)	Total N (%)
Places for me to exercise are too far away	89 (35.7)	149 (45.7)	238 (41.4)
I am too embarrassed to exercise	16 (6.4)	29 (8.9)	45 (7.8)
It costs too much money to exercise	57 (22.9)	93 (28.5)	150 (26.1)
Exercise facilities do not have convenient schedules for me	110 (44.2)	159 (48.8)	269 (46.8)
I think people in exercise clothes look funny	23 (9.2)	33 (10.1)	56 (9.7)
There are too few places for me to exercise	100 (40.2)	120 (36.8)	220 (38.3)
Exercise takes too much time from family relationships	31 (12.4)	36 (11.0)	67 (11.7)
Exercise takes too much time from my family responsibilities	35 (14.1)	53 (16.3)	88 (15.3)
exercising takes too much of my time	60 (24.1)	121 (37.1)	181 (31.5)
Exercise tires me	118 (47.4)	208 (63.8)	326 (56.7)
I am fatigued by exercise	101 (40.6)	172 (52.8)	273 (47.5)
My spouse (or significant other) does not encourage exercising	35 (14.1)	33 (10.1)	68 (11.8)
My family members do not encourage me to exercise	35 (14.1)	39 (12.0)	74 (12.9)

The undergraduate emerging adults in the present study sought physical activity information from varied sources, with the majority preferring social media and friends. Previously, the internet has been reported to be a major source of physical activity-related information [7, 22]. In an earlier study, undergraduate emerging adults preferred internet websites (61.4%), friends (54.5%), and social media (51%) respectively, as physical activity information sources [7]. Social media sites are vastly becoming a means of accessing online health information and promotion in developing countries [23]. Social media enhances the ease and prompt delivery of health information. Further, social media helps individuals to remotely engage with health professionals and significant others, as was the case during the coronavirus pandemic [24]. However, social media could also be a means of passing false and or/unverified health information [25]. From the foregoing, health policies must be promulgated to ensure adequate screening of health information disseminated via social media. Emerging adults in this study sought physical activity information mainly to enhance their physical appearance. Recently, achieving fitness and an ideal weight has become a great concern among this population, particularly females. Females are reported to be obsessed with how they look, and as such, diet, exercise, and seeking information on these topics have intertwined into their daily routines [26]. Contrastingly, maintaining health was the major reason males sought physical activity information.

The result shows that more than half of the emerging adults participated in various physical activity programs, with football and dance clubs leading the pack. Anecdotally, engagement in physical activity or sports

is generally encouraged in this population. Amidst students' busy schedules, they still find time to engage in physical activity programs. Males tend to show their masculine strength in football matches, and most times, they refer to males who show no interest in football as less masculine. On the other hand, females participate more in dancing activities and aerobics than other forms of physical activities. Generally, females are interested in their fitness and obsessed with their physical appearance more than anything [9]. Therefore, they tend to engage in dancing and aerobics exercises more in a bid to help them achieve their desire. This study highlighted some barriers to physical activity faced by undergraduate emerging adults; top on the list was tiredness. The academic session during which this study was conducted was short with a high level of rigorous academic activity because of the disruption in the academic calendar because of the COVID-19 lockdown. To meet up with the school's calendar, academic activities became more frequent, and longer hours of classes were held. This resulted in students being tired, thus posing a barrier to being physically active. Barriers to physical activity have been reported to negatively influence physical activity participation among emerging adults [26]. Therefore, elective courses for physical activities should be included in the school curriculum to increase participation in physical activity.

Following logistic regression emerging adults with low physical activity were less likely to seek information. They may see no reason in wanting to seek information as they do not engage in such behaviour. It may also be that they are not enlightened about the benefits of physical activity. Also, some individuals believe that daily activities, such

Table 4 Logistic regression showing the association between physical activity-seeking behaviour, barriers to physical activity, and physical activity

	B	P value	Odds ratio	95% Confidence interval for odds ratio
Model 1 ^a				
Gender				
Male	0.120	0.566	1.13	0.75–1.70
Female	Reference			
Socioeconomic status		0.264		–
Low	–0.414	0.262	0.66	0.32–1.36
Middle	0.092	0.714	1.10	0.67–1.80
High	Reference			
BMI classification		0.592		–
Underweight	0.355	0.443	1.43	0.58–3.53
Normal	0.508	0.186	1.66	0.78–3.53
Overweight	0.424	0.322	1.53	0.66–3.54
Obese	Reference			
Barriers to physical activity				
Low	0.163	0.394	1.18	0.81–1.71
High	Reference			
Age group				
Below 23	0.077	0.689	1.08	0.74–1.58
23 and above	Reference			
Faculty		0.004		–
Arts	–0.206	0.548	0.81	0.42–1.59
Basic Medical Sciences	0.335	0.304	1.40	0.74–2.65
Education	–0.250	0.463	0.78	0.40–1.52
Engineering	0.337	0.353	1.40	0.69–2.86
Law	0.811	0.016	2.25	1.17–4.34
Physical Sciences	0.830	0.025	2.29	1.11–4.75
Social Sciences	Reference			
Participating in physical activity programme				
Yes	0.749	0.000	2.12	1.45–3.08
No	Reference			
Physical activity level		0.057		–
Low	–0.731	0.017	0.48	0.26–0.88
Moderate	–0.216	0.319	0.81	0.53–1.23
High	Reference			
Constant	–0.678	0.251	0.51	–
Model 2 ^b				
Barriers to physical activity				
Low	0.157	0.403	1.170	0.809–1.693
High	Reference			
Physical activity level				
Low	–0.723	0.015	0.485	0.270–0.871 ^a
Moderate	–0.203	0.341	0.816	0.537–1.240
High	Reference			
Participating in physical activity programme				
Yes	0.734	0.000	2.084	1.442–3.012
No	Reference			
Faculty of study				
Arts	–0.207	0.542	0.813	0.419–1.580

Table 4 (continued)

	B	P value	Odds ratio	95% Confidence interval for odds ratio
Basic Medical Sciences	0.355	0.267	1.426	0.763–2.666
Education	−0.252	0.452	0.777	0.403–1.498
Engineering	0.393	0.252	1.482	0.756–2.907
Law	0.816	0.014	2.260	1.180–4.330
Physical Sciences	0.876	0.016	2.402	1.180–4.889
Social Sciences	Reference			
Constant	−0.116	0.738	0.891	

^a Level of significance, a-forced entry method, b-controlling for faculty of study and participation in physical activity programmes, physical activity information seeking (yes or no) as outcome variable

as walking to classes, even when it does not accumulatively meet the recommended levels of physical activity, are sufficient and thereby do not go the extra mile of seeking physical activity information [26]. Therefore, there is a need for physical activity promoters to concentrate on this group. Since this group may not actively seek physical activity information, there is a need to make available passive methods, including posters, billboards, and pop-up ads on social media sites, to encourage them to be physically active. In addition, health promotion programs should be organised for emerging adults with low physical activity levels to augment the need to engage in physical activity-related programs.

Barriers, including lack of motivation, other competing interests, and concerns about engaging in physical activity publicly, have often been documented to reduce participation in physical activity [6]. However, such barriers were not associated with physical activity information-seeking behaviour in this study. It is possible that factors including participating in physical activity programmes may have attenuated this association.

This study is not without limitations. Firstly, there is no standardised instrument for assessing physical activity information-seeking behaviour, and as such, only content and face validity could be done for the instrument in this study. In addition, while general assembly gatherings of students where the research instruments were administered to respondents are a fair representation of the studentship in each faculty, not all students are likely to be present during the survey period.

Conclusions

Undergraduate emerging adults seek physical activity information using social media more to enhance their physical appearance and engage in general exercise. More

so being physically inactive leads to a lesser likelihood of seeking physical activity information.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s43161-024-00187-6>.

Additional file 1. The International Physical Activity Questionnaire short form.

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Authors' contributions

Conception or design of the work: OAI. Data collection: BO, IA, and BIA. Data analysis and interpretation: HOF, OAI, and BO. Drafting the article: OAI, BO, HOF, IA, and BIA. Critical revision of the article: OAI, BO, HOF, IA, and BIA. Final approval of the version to be published: OAI, BO, HOF, IA, and BIA.

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Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to restrictions on data management by the researcher affiliation but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Procedure for Data Collection for this study was approved by the College of Medical Sciences Research Ethics Committee, University of Benin, Benin (CMS/REC/2021/184). In addition, informed consent was obtained from respondents before participation in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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References

- Lambert SD, Loissele CG. Health information—seeking behavior. *Qual Health Res.* 2007;17(8):1006–19. <https://doi.org/10.1177/1049732307305199>.
- Basch CH, MacLean SA, Romero RA, Ethan D. Health information seeking behavior among college students. *J Comm Health.* 2018;43(6):1094–9.
- Hayes G, Dowd KP, MacDonncha C, Donnelly AE. Tracking of physical activity and sedentary behaviour from adolescence to young adulthood: a systematic literature review. *J Adolesc Health.* 2019;65(3):446–54.
- Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med.* 2020;54(24):1451–62. <https://doi.org/10.1136/bjsports-2020-102955>.
- Warburton DER, Bredin SSD. Health benefits of physical activity. *Curr Opin Cardiol.* 2017;32(5):541–56.
- Sweeney AM, Wilson DK, Brown A. A qualitative study to examine how differences in motivation can inform the development of targeted physical activity interventions for African American women. *Eval program plann.* 2019;77:101718.
- Ori EM, Berry TR. Physical activity information seeking among emerging adults attending university. *J Am Coll Health.* 2020;70(1):223–31.
- Asibey BO, Agyemang S, Dankwah AB. The internet use for health information seeking among Ghanaian University students: a cross-sectional study. *Int J Telemed Appl* 2017:1–9. <https://doi.org/10.1155/2017/1756473>.
- Jalali S, Keshvari M, Soleymani MR. Fitness information-seeking behavior among female university students: a qualitative study. *PLoS ONE.* 2020;15(8):0237735.
- Szeszuluski J, Walker TJ, Robertson MC, Fernandez ME. Differences in psychosocial constructs among elementary school staff that implement physical activity programs: a step in designing implementation strategies. *Transl Behav Med.* 2022;12(2):237–42. <https://doi.org/10.1093/tbm/ibab120>.
- International Physical Activity Questionnaire. Guidelines for data processing and analysis of the international physical activity questionnaire (IPAQ) – short and long forms IPAQ. Available at <http://www.IPAQ.ki.se>; 2022.
- Sechrist KR, Walker SN, Pender NJ. Development and psychometric evaluation of the exercise benefits/barriers scale. *Res Nurs Health.* 1987;10(6):357–65.
- Mbada C, Adedoyin R, Odejide A. Relationship between socioeconomic status and body mass index among adult Nigerians. *Afr J Physiother Rehabil Sci.* 2010;2010(1):1–6.
- World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA.* 2013;310(20):2191–4. <https://doi.org/10.1001/jama.2013.281053>.
- Jakobsen M, Jensen R. Common method bias in public management studies. *Int Publ Manag J.* 2015;18(1):3–30. <https://doi.org/10.1080/10967494.2014.997906>.
- Sima BT, Belachew T, Abebe F. Health care providers' knowledge, attitude and perceived stigma regarding tuberculosis in a pastoralist community in Ethiopia: a cross-sectional study. *BMC Health Serv Res.* 2019;19(1):19. <https://doi.org/10.1186/s12913-018-3815-1>.
- Saller FVI, Khaled SM. Potential psychosocial influences on gender differences in physical activity among Qatari adolescents: a first insight through descriptive observation. *Int J Adolesc Youth.* 2019;24(2):234–51. <https://doi.org/10.1080/02673843.2018.1515087>.
- Nunes HEG, Silva DAS, Goncalves ECA. Prevalence and factors associated with stages of behavior change for physical activity in adolescents: a systematic review. *World J Pediatr: WJP.* 2017;13(3):202–9. <https://doi.org/10.1007/s12519-017-0027-4>.
- Sultan S, Hussain I, Fatima S. Social connectedness, life contentment, and learning achievement of undergraduate university students—does the use of internet matter? *Bull Educ Res.* 2020;42(1):11–25.
- Sundgot-Borgen C, Sundgot-Borgen J, Bratland-Sanda S, Kolle E, Torstveit MK, Svantorp-Tveiten KME, et al. Body appreciation and body appearance pressure in Norwegian university students comparing exercise science students and other students. *BMC Public Health.* 2021;21(1):532.
- Brown Z, Tiggemann M (2021). Celebrity influence on body image and eating disorders: a review. *J Health Psychol.* <https://doi.org/10.1177/135910532098831> and [cited Dec 20, 2021].
- Lee HY, Jin SW, Henning-Smith C, Lee J, Lee J. Role of health literacy in health-related information-seeking behaviour online: cross-sectional study. *J Med Internet Res.* 2021;23(1):e14088.
- Hagg E, Dahinten VS, Currie LM. The emerging use of social media for health-related purposes in low and middle-income countries: a scoping review. *Int J Med Inform.* 2018;115:92–105.
- Goodyear VA, Boardley I, Chiou SY, Fenton SAM, Makopoulou K, Stathi A, et al. Social media use informing behaviours related to physical activity, diet and quality of life during COVID-19: a mixed methods study. *BMC Public Health.* 2021;21(1):1333.
- Pulido CM, Ruiz-Eugenio L, Redondo-Sama G, Villarejo-Carballido B. A new application of social impact in social media for overcoming fake news in health. *Int J Environ Res Public Health.* 2020;17(7):2430.
- Ranasinghe C, Sigera C, Ranasinghe P, Jayawardena R, Ranasinghe ACR, Hills AP, et al. Physical inactivity among physiotherapy undergraduates: exploring the knowledge-practice gap. *BMC Sports Sci Med Rehabil.* 2016;8(1):395.

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