

Health Behaviors, Health Cognition and Sources of Health Information Among Nursing Students: A Cross-Sectional Study

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Abstract

Background: Nursing students are knowledgeable about health promoting behavior and should be role models for patients, although it is not unusual for them to lead unhealthy lifestyles.

Aim: This study aimed to examine health behaviors, associated cognitive factors and sources of health information among nursing students.

Methods: In total, 51 undergraduate nursing students from a university in Croatia answered a self-reported questionnaire related to health behaviors, health cognition factors and sources of health information. The statistical software package SPSS was used for statistical analysis, and descriptive statistics and correlations were analyzed.

Results: The results show that the nursing students demonstrated a moderate level of health-promoting behaviors. In general, the nursing students had a high level of health consciousness, very strong health-oriented beliefs and were generally willing to seek health information. More than 90% of them believed that social networks have a strong or very strong influence on health and confidence in the healthcare system. However, they did not perceive social networks as reliable sources of health information. As for national and international sources of health information, the Croatian Institute of Public Health is the most frequently used.

Conclusion: While the nursing students demonstrated high levels of health consciousness and information orientation, it is necessary to implement interventions that aim at empowering students to adopt healthy behaviors and cultivate personal health habits.

Keywords: health behavior, health promotion, health information, nursing students

Introduction

Health promotion is essential to improve people's well-being and mitigate the prevalence of non-communicable diseases (NCDs), which continue to pose significant global health challenges. NCDs, such as heart disease, diabetes, stroke and cancer are closely linked to lifestyle behaviors such as poor diet, tobacco use, excessive alcohol consumption and physical inactivity. Fortunately, many NCDs can be prevented by adopting health-promoting lifestyles and empowering people to take responsibility for their health (1). Among healthcare professionals, nursing professionals play a crucial role in the promotion of health and healthy lifestyles while delivering interventions to their clients. As such, nursing students should establish credibility to educate individuals effectively about healthy habits and serve as role models for patients. However, it has been observed that both nurses and nursing students, despite their health knowledge, have unhealthy lifestyles, including poor diet, low physical activity, and alcohol and tobacco consumption (2-7). Therefore, nursing students should adopt healthy behaviors during their education, if not earlier, which could provide the basis for maintaining health-promoting behaviors once they become nurses.

Health behavior is related to various factors, such as health consciousness, health information orientation and health-oriented beliefs. For example, if an individual believes that a medicine should not be taken until the prescribed amount is used up, but should be stopped when the symptoms disappear, they will not take it, despite the doctor's instructions. Health consciousness is the degree to which an individual cares about his health (8). The more health-conscious individuals are, the more likely they are to have healthy habits (9), which is the basis for taking preventive measures. Self-awareness of one's health and a willingness to participate in activities that promote wellness and health are indicators of health consciousness (10). It should come as no surprise that people who care about their health actively seek information on how to become healthier

and follow through (11,12). A high degree of health information orientation indicates a willingness to seek out information about health-related issues and educate oneself about them. Health information orientation could be defined as the degree to which a person is willing to seek health-related information.

Additionally, the specific thoughts that people have about healthy behaviors, such as exercising and eating a balanced diet, are referred to as health beliefs. Since a person's willingness to change their health behaviors primarily comes from their health perceptions, it is important to examine health beliefs.

In addition, a variety of digital communication platforms, collectively referred to as social networks, facilitate the creation and exchange of ideas and information on both peer-to-peer and broader scales. Research findings can be disseminated to a wide audience through social networks. Healthcare professionals can also use social networks to educate the public about a range of healthcare topics, which helps to improve health literacy (13).

However, issues have been raised about the spread of misleading information and the lack of oversight mechanisms to guarantee the veracity of the content shared on these platforms, which makes people increasingly skeptical of the information they encounter on social networks.

Therefore, the primary objective of this study was to investigate the health behaviors, associated cognitive factors and health information sources among undergraduate nursing students.

Materials and Methods

Study design

This was a cross-sectional study.

Ethics

The study protocol did not undergo an ethics review, as it relied on anonymous data without any identifying information,

thereby minimizing the risk of participant identification. Additionally, no sensitive information was collected, and respondents experienced no greater stress or discomfort while completing the questionnaire than they would in everyday situations.

Participants

The participants were second-year undergraduate nursing students enrolled in the professional Bachelor of Nursing program at the University of the North in Croatia. They responded to questions concerning health behaviors, health cognition, and sources of health information.

Measures

Health behaviors. The scale used to assess health behaviors consisted of 20 items and five subscales, of which three subscales reflect health-promoting behaviors: Diet (5 items), Preventive Self-Care (7 items), and Medical Compliance (2 items), while two subscales reflected health risk behavior: Anger and Stress (3 items) and Substance Use (3 items). Participants were asked to rate how much each given item applied to them on a scale from 1 (always) to 7 (never). The health-promoting items are reverse-scored, so a higher score represents better health behavior. Cronbach's alpha for the subscales ranged from 0.60 to 0.87.

Health consciousness. Five items were used to measure health consciousness: ("Eating right, exercising, and taking preventive measures will keep me healthy for life," "I do everything I can to stay healthy.") Responses were measured on a 1 to 5 scale, with 1 representing "strongly disagree" and 5 representing "strongly agree." Cronbach's alpha for this scale was 0.85.

Health information orientation. Eight items measured health information orientation (e.g., "I really enjoy learning about health issues," "When I take medicine, I try to get as much information as possible about its benefits and side effects"). Responses were measured on a 1 to 5 scale, with 1 representing

"strongly disagree" and 5 representing "strongly agree." Cronbach's alpha for this scale was 0.84.

Health-oriented beliefs. Participants were asked to rate how important they think certain behaviors are to their overall health, on a scale from 1 (not important at all) to 5 (very important). Items included "eating a diet that is low in fat," "eating lots of fruits, vegetables and grains," "drinking plenty of water every day," "taking vitamins and mineral supplements regularly," "exercising regularly," "not smoking cigarettes," "not drinking alcohol or drinking in moderation" and "maintaining a healthy body weight." Cronbach's alpha for this scale was 0.63.

Sources of health information. Two items were used to measure attitude toward social networks: "To what extent do you think social networks affect health?" and "To what extent do you think social networks affect trust in the healthcare system?" Responses were measured on a 1 to 5 scale, with 1 representing "not at all" and 5 representing "extremely strong." Furthermore, the perceived reliability of social networks for providing health information (Facebook, Instagram, TikTok, LinkedIn, Twitter(X) and YouTube) was measured on a 1 to 5 scale, with 1 representing "completely unreliable" and 5 representing "completely reliable." The extent of the use of certain sources of health information (Medscape, World Health Organization [WHO], Center for Disease Control [CDC], European Center for Disease Control [ECDC], Croatian Institute of Public Health [CIPH], Mayo Clinic) was measured on a 1 to 5 scale, with 1 representing "not at all" and 5 representing "always."

Data were analyzed using SPSS Statistics for Windows, version 22.0. Descriptive analysis was used for demographic and health-related variables. A correlation analysis was performed to determine the relationship among health behaviors, health consciousness, health information orientation and health-orientated beliefs.

Results

In total, 51 students participated in the study, of whom 45 were women (88%) and 6 were men (12%). The average age of the participants was 22.69 (± 5.39 ; 19–42) years.

The results of the health behaviors are presented in Table 1. Overall, the nursing students showed a moderate level of health-promoting behaviors. Predominantly, they exhibit positive health behaviors toward medical cooperation (e.g., immediate collection of prescribed medicines from the pharmacy) and avoidance of substance use (e.g., use of tobacco products, alcohol or drugs). However, they exhibit the least positive health behaviors toward a healthy diet and the regulation of anger and stress, while moderately engaging in preventive self-care.

Table 1. Results on the Health behaviors scale (N=51)

Health behaviors	M	SD
Diet	3.96	1.12
Preventive self-care	4.87	1.08
Regulation of anger and stress	4.07	1.37
Medical compliance	6.28	1.37
Avoidance of substance use	5.84	1.53

The results of the health cognition scales (Table 2) indicate that the participants have a high level of health consciousness

Table 2. Results on the Health cognition scale (N=51)

Health cognition	M	SD
Health consciousness	4.02	0.76
Health information orientation	4.04	0.62
Health-orientated beliefs	4.50	0.36

($M=4.02\pm 0.76$) and are largely willing to seek health information ($M=4.04\pm 0.62$). Furthermore, the students have extremely strong health-orientated beliefs ($M=4.50\pm 0.36$).

The results presented in Table 3 show that people who are health conscious are more likely to search for health-related information ($r=0.523$, $p<0.01$) and have stronger health beliefs ($r=0.278$, $p<0.05$). Health consciousness is also correlated to preventive self-care activities ($r=0.381$, $p<0.01$) as part of health behavior, but no significant correlation with other aspects of health behavior was found. The same was observed for health-orientated beliefs, only showing a significant correlation with preventive self-care ($r=0.417$, $p<0.01$). Health information orientation is significantly correlated to healthy diet ($r=0.340$, $p<0.05$), regulation of anger and stress ($r=0.295$, $p<0.05$), as well as with preventive self-care ($r=0.140$, $p<0.05$).

Finally, the results show that more than 90% of the participants believe that social networks have a strong or very strong influence on health and trust in the healthcare system.

Table 3. Correlations among health behaviors, health consciousness, health information orientation and health-orientated beliefs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Diet	1							
(2) Regulation of anger and stress	0.297*	1						
(3) Preventive self-care	0.340*	-0.027	1					
(4) Medical compliance	0.012	0.069	0.471**	1				
(5) Avoidance of substance use	-0.046	0.186	0.314*	0.490**	1			
(6) Health consciousness	0.186	0.147	0.381**	0.047	0.204	1		
(7) Health information orientation	0.340*	0.295*	0.140*	-0.058	-0.074	0.523**	1	
(8) Health-orientated beliefs	0.108	-0.031	0.417**	-0.124	0.081	0.278*	0.223	1

** Correlation is significant at the 0.01 level.

* Correlation is significant at the 0.05 level

However, on average, they do not perceive social networks as a reliable source of health information. Among the listed social network platforms presented in Figure 1, they perceive TikTok as completely unreliable, while YouTube is perceived as a moderately reliable source of health information.

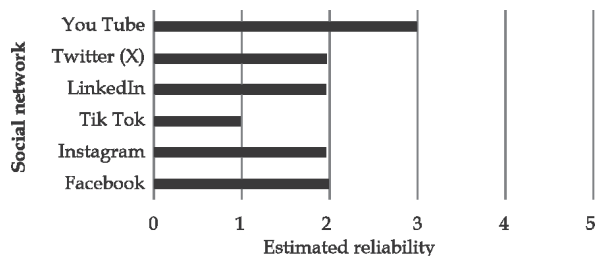


Figure 1. Estimated reliability of social networks in providing health information (N=51)

On the other hand, regarding the use of national and international sources of health information, Figure 2 shows that the Croatian Institute of Public Health (CIPH) is the most frequently used, while Medscape and the Mayo Clinic are the least contacted sources of health information among the nursing students.

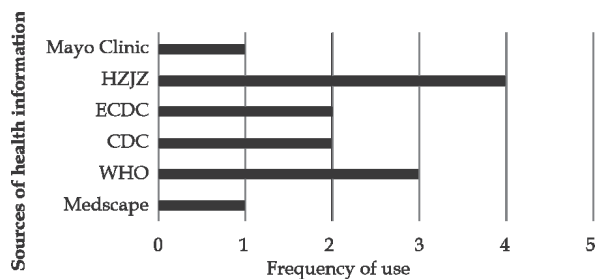


Figure 2. Frequency of use of sources of health information (N=51)

Discussion

This study evaluated health behaviors, health cognition and sources of health information among a group of nursing students in Croatia.

Regarding the health behaviors of the nursing students, the mean scores ranged from 3.96 (1.12) to 6.28 (1.37) out of 7 points among different aspects of health behaviors, which is higher at midpoint for most of the aspects of health behaviors. These results are similar to those of previous studies (14, 15). The lowest result was found for the aspect of a healthy

diet, which can be related to the status, lifestyle and possibly lower accessibility of healthful food choices. In general, university life and lifestyle may have a negative effect on students, worsening the health behaviors of some of them (16). For example, a study among first-year nursing students in Spain and Colombia showed a high prevalence of poor diet, poor sleep and insufficient physical activity, a moderate level of alcohol consumption and low levels of smoking (7). Among Scottish students, one-quarter smoked and nearly half were overweight or obese, while 15.4% (4) reported binge drinking.

In this study, the second lowest score on health behaviors was found for the regulation of anger and stress, which could be related to a lack of coping strategies among students with various life stressors. This is an important finding that requires intervention because the nursing profession assumes high levels of work-related stress. Different studies recognize that high demands and low control in nursing practice, as well as unfavorable work schedules (e.g., work overload, shift work, long working hours), contribute to increased stress and burnout and lower levels of job satisfaction (17–19). High levels of work-related stress can lead to unhealthy habits. There is considerable evidence that prolonged stress is associated with binge eating and increased sugar, fat and salt; and that chronic stress leads to weight gain and obesity (20). Therefore, it is important to prepare nursing students for stressful work environments and improve their coping strategies to preserve their physical and mental health.

Finally, the highest health-promoting behaviors were found on the subscales of the avoidance of substance use (tobacco, alcohol and drugs) and medical compliance, indicating that nursing students are willing to follow medical instructions. There is a mixed picture of the lifestyles of undergraduate nursing students in different countries.

The results of the health cognition scales indicate that the nursing students in this study have a high level of health consciousness and are largely willing to seek

health information. Furthermore, students have extremely strong beliefs, indicating that they recognize that maintaining a healthy weight, drinking plenty of water daily and eating plenty of fruits, vegetables and grains are crucial to their overall health. The study showed that students who are health conscious are more likely to search for health-related information and have stronger health beliefs. Both health consciousness and health-orientated beliefs are significantly associated with preventive self-care activities as part of health behavior, but no significant correlation with other aspects of health behavior was found. Despite the nursing students' knowledge about the importance of health behavior and healthy lifestyle, it is not always associated with health-related activities. This has also been shown in other studies, indicating that knowledge of the health-promoting behaviors among nurses and nursing students did not necessarily lead to health-promoting behaviors (21–23). Ross et al. (2017) suggested that both intrinsic (personal) and extrinsic (environmental) factors, such as age, sex, past experiences, anxiety, depression, as well as institutional support, work schedules and demands, can interfere with the health promotion behaviors of nurses (21).

Furthermore, health information orientation is significantly correlated with a healthy diet, regulation of anger and stress, and preventive self-care. Duta-Bergman (2004) showed that the search for information about a healthy lifestyle was positively associated with health consciousness, health beliefs and engaging in healthful activities (24).

People obtain health information from a variety of sources. Medical professionals, friends, family, books, newspapers, magazines, educational brochures, radio, television and pharmaceutical advertisements are among the sources from which we piece together our knowledge about health and well-being. However, more and more of us are turning to the Internet, including social networks, in search of answers, as opposed to other sources (25).

The Internet has become a popular resource for learning about health and researching

one's health condition. However, people can easily become misinformed due to the large amount of inaccurate information online. Although the Internet is thought of as a single, cohesive source of content, it consists of a wide range of distinct platforms and features. It is easy to find both low-quality and high-quality health information online, and because few social network platforms distinguish between trustworthy and non-trustworthy sources of information, users are left to determine for themselves how much trust to place in a source and the quality of the information it shares. These decisions are influenced by a variety of factors, including their level of digital and health literacy, prior knowledge, personal situations and personal beliefs. The motivation to research topics related to our health conditions or symptoms is greater, but even in these cases, determining the reliability of sources and the precision of information is a very challenging task (26).

Regarding social networks as a source of health information, this study shows that more than 90% of the nursing students consider that social networks have a strong or very strong influence on health and trust in the healthcare system. However, they did not perceive social networks as a reliable source of health information, evaluating TikTok as completely unreliable, while YouTube is perceived as a moderately reliable source of health information. These findings are consistent with what we mentioned above, that social networks can improve patient care and education but can also put patients and healthcare professionals at risk. The dissemination of inaccurate information can hurt patients and damage a provider's reputation.

Regarding the use of national and international sources of health information by the nursing students, the study showed that the Croatian Institute of Public Health (CIPH) is the most widely used source for searching for health information, which is expected, as it is the leading national public health institution that provides accurate information about different aspects of health. This is in line with research from 2015, where 70% of Americans

reported that they viewed the CDC, the national public health agency of the United States, favorably (27).

It is well known that young people are active users of the Internet and that social networks influence people's daily life and their health behavior. Horgan and Sweeney (2012) in their study among Irish college students found that 66.1% of the participants had used the Internet to search for health information, for a variety of reasons, including information on specific diseases, sexual health, fitness and nutrition (28). However, in a study by Skinner et al. (2003) involving young people, they reported that the quality of information online was a concern for 96% of the participants (29).

There are several practical implications of this study. Firstly, the college environment is an ideal opportunity for encouraging a healthy lifestyle. In particular, the college can introduce more healthful food options in their facilities or provide students with physical activity within the college area or student sports clubs. Secondly, the college can implement the improvement of coping strategies as a way to reduce stress and prevent using unhealthy habits as a way of coping with stress.

Taking into account the frequency of the use of the Internet and social networks as a source of health information, the perceived impact of social networks on health and trust in the healthcare system, and the perceived reliability of social networks in providing health information, it is important to emphasize that there is still room for the additional training of nursing students on how to search health information and think critically in such a way that, in courses where this is possible, together with professors, they could search health information and comment on the decision-making process as to why something seems credible or not. Furthermore, given the perceived impact of social networks on health and trust in the healthcare system, as well as the use of the CIPH as a source of information, it is evident that there is confidence and an opportunity for the public healthcare system to promote

health and provide accurate and reliable health information.

This study has several limitations, including the fairly small sample from a single university, which can provide an overview but not general conclusions about the measured variables. The small proportion of male participants did not permit comparisons between male and female students in the measured variables. The use of only self-reported measures of health consciousness, health information orientation, health beliefs and health behavior without any objective measure was another limitation. Future research should use direct measures of health behavior, not just self-reports. Furthermore, all the nursing study programs in Croatia should be included in order to obtain complete information that could be used to make specific and comprehensive recommendations. Finally, in further research, other variables such as personal and environmental variables, which are drivers of and barriers to the health-promoting behaviors of nursing students, should also be included.

Conclusion

As future healthcare workers, nursing students contribute significantly to both their personal health and public health. Despite their knowledge of health-promoting behaviors, high levels of health consciousness or health information orientation, and strong health beliefs, this does not always result in a healthy lifestyle. As a result, nursing education must incorporate not only the knowledge and skills needed for health promotion but also empower students to engage in health-promoting behaviors and search for accurate and reliable health information.

Declarations

Authors' contributions

All authors have read and agreed to the published version of the manuscript. Each of the undersigned authors confirms that they have contributed significantly to the work in the following ways:

PB, HK, MB: concept and study design; MB: data collection; PB, HK: data analysis and interpretation; PB, HK, MM: writing first draft of the manuscript. PB, HK, MM, MB: revising the manuscript for critical intellectual content. All authors approved the final version of the manuscript.

Ethics

The authors confirm that the research was conducted in accordance with ethical guidelines and principles.

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Conflict of interests

The authors have no conflict of interest related to this work.

Data sharing statement

The authors confirm that the data can be obtained by contacting the corresponding author.

References

- Kumar S, Preetha G. Health promotion: an effective tool for global health. *Indian J Community Med.* 2012;37(1):5-12.
- Blake H, Patterson J. Paediatric nurses' attitudes towards the promotion of healthy eating. *Br J Nurs.* 2015;24(2):108-12.
- Burke E, McCarthy B. The lifestyle behaviours and exercise beliefs of undergraduate student nurses. *Health Educ.* 2011;111(3):230-46.
- Evans JM, Eades CE, Cameron DM. Health and health behaviours among a cohort of first year nursing students in Scotland: A self-report survey. *Nurse Educ Pract.* 2019;36:71-5.
- Klainin-Yobas P, He HG, Lau Y. Physical fitness, health behaviour and health among nursing students: A descriptive correlational study. *Nurse Educ Today.* 2015;35(12):1199-205.
- Blake H, Malik S, Mo PK, Pisano C. "Do as I say, but not as I do": Are next generation nurses role models for health? *Perspect Public Health.* 2011;131(5):231-9.
- Rodriguez-Gazquez M, Chaparro-Hernandez S, González-López JR. Are first-year nursing students' lifestyles coherent with their future career? *Int J Nurs Pract.* 2017;23(2).
- Dutta-Bergman MJ. Primary sources of health information: comparisons in the domain of health attitudes, health cognitions, and health behaviors. *Health Commun.* 2004;16(3):273-88.
- Chen M, Lin N. Incorporation of health consciousness into the technology readiness and acceptance model to predict app download and usage intentions. *Internet Res.* 2018;28(2):351-73.
- Michaelidou N, Hassan LM. The role of health consciousness, food safety concern and ethical identity on attitudes and intentions towards organic food. *Int J Consum Stud.* 2007;32(2):163-70.
- Iversen AC, Kraft P. Does socio-economic status and health consciousness influence how women respond to health related messages in media? *Health Educ Res.* 2006;21(5):601-10.
- Basu A, Dutta MJ. The relationship between health information seeking and community participation: the roles of health information orientation and efficacy. *Health Commun.* 2008;23(1):70-9.
- Jeyaraman M, Ramasubramanian S, Kumar S, Jeyaraman N, Selvaraj P, Nallakumarasamy A, et al. Multifaceted Role of Social Media in Healthcare: Opportunities, Challenges, and the Need for Quality Control. *Cureus.* 2023;15(5).
- Hosseini M, Ashktorab T, Taghdisi MH, Vardanjani AE, Rafiei H. Health-promoting behaviors and their association with certain demographic characteristics of nursing students of Tehran City in 2013. *Glob J Health Sci.* 2014;7(2):264-72.
- Hwang Y, Oh J. Factors Affecting Health-Promoting Behaviors among Nursing Students. *Int J Environ Res Public Health.* 2020;17(17):6291.
- Bryer J, Cherkis F, Raman J. Health-promotion behaviors of undergraduate nursing students: a survey analysis. *Nurs Educ Perspect.* 2013;34(6):410-5.
- Caruso CC. Negative impacts of shiftwork and long work hours. *Rehabil Nurs.* 2014;39(1):16-25.
- Buss J. Associations between obesity and stress and shift work among nurses. *Workplace Health Saf.* 2012;60(10):453-8.
- Khamisa N, Peltzer K, Oldenburg B. Burnout in relation to specific contributing factors and health outcomes among nurses: a systematic review. *Int J Environ Res Public Health.* 2013;10(6):2214-40.
- Sinha R, Jastreboff AM. Stress as a common risk factor for obesity and addiction. *Biol Psychiatry.* 2013;73(9):827-35.
- Ross A, Bevans M, Brooks AT, Gibbons S, Wallen GR. Nurses and Health-Promoting Behaviors: Knowledge May Not Translate Into Self-Care. *AORN J.* 2017;105(3):267-75.
- Hong SH. Convergence study of health promoting behaviors between nursing students and general college students. *J Korea Converg Soc.* 2018;9(12):339-46.
- Bryer J, Cherkis F, Raman J. Health-promotion behaviors of undergraduate nursing students: a survey analysis. *Nurs Educ Perspect.* 2013;34(6):410-5.

24. Dutta-Bergman MJ. Health attitudes, health cognitions, and health behaviors among Internet health information seekers: population-based survey. *J Med Internet Res*. 2004;6(2).
25. Jacobs W, Amuta AO, Jeon KC. Health information seeking in the digital age: an analysis of health information seeking behavior among US adults. *Cogent Soc Sci*. 2017;3(1):1302785.
26. Kington RS, Arnesen S, Chou WS, Curry SJ, Lazer D, Villarruel AM. Identifying Credible Sources of Health Information in Social Media: Principles and Attributes. *NAM Perspect*. 2021;2021:10.31478/202107a.
27. Pew Research Center. Most view the CDC favorably; VA's image slips [Internet]. 2015 [cited 2024 Feb 28]. Available from: <https://www.pewresearch.org/politics/2015/01/22/most-view-the-cdc-favorably-vas-image-slips/>
28. Horgan Á, Sweeney J. University students' online habits and their use of the Internet for health information. *Comput Inform Nurs*. 2012;30(8):402-8.
29. Skinner H, Biscope S, Poland B, Goldberg E. How adolescents use technology for health information: implications for health professionals from focus group studies. *J Med Internet Res*. 2003;5(4).