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Health education and global health: Practices, applications, and future research

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Abstract:

Health education is a crucial consideration in the healthcare system and has the potential to improve global health. Recently, researchers have expressed interest in streamlining health education, utilizing digital tools and flexible curriculums to make it more accessible, and expanding beyond disease and substance abuse prevention. They have also expressed interest in promoting global health through health and safety promotion programs. Amidst the COVID-19 pandemic, climate change, the refugee crisis, and overpopulation, healthcare crises are erupting all over the world. A lack of health education has and will continue to have a profound impact on community healthcare indicators, particularly in low-income nations. Current priorities within the health education sector include digitization, equity, and infectious disease prevention. Studies and data from university journals and other academic databases were analyzed in a literature review. Health education programs have a significant positive impact on attitudes and behaviors regarding global health. Improving upon these programs by digitizing them and expanding upon the scope of health education will help ensure that such interventions and programs make a significant difference.

Keywords:

Chronic illness, digital health education, global health, health education, health education programs, health promotion, mental health

Introduction

Health education is a social science that draws from a multitude of fields, often taking a biopsychosocial approach towards promoting health and preventing disease. It can encompass instruction in hygiene, reproductive health, nutrition, and more, and help address global healthcare crises by giving community members the tools necessary to engage in preventative care measures.

The majority of health education programs are school or organization based and are taught in standardized curriculums with the common goals of preventing substance abuse, the spread of disease, and premature pregnancy. However, recently, there has

been a shift in health education towards a more creative and digital approach, and towards an expansion to mental health, preventative care, and more.

This paper discusses current health education program types and studies, along with the future of health education, up-and-coming methods for health promotion, and suggestions for future research within the field.

Materials and Methods

Studies and data from PubMed and Medline, as well as university journals and other academic databases, were analyzed in a literature review encompassing current innovations in health education. The criteria for the studies used were as follows: studies had to (1) be published in English; (2) focus on implementing health education

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programs and interventions or designing them; (3) be published in or after 1990 to ensure relevance; and (4) be relevant to emerging research in the field of health education. Findings were synthesized into suggestions for future studies in particularly pressing areas.

Past progress and the current situation

The positive impact of health education on physical and mental health is measurable. Meheba Refugee Settlement in Zambia was established in 1971 and hosts tens of thousands of refugees. In the early 2000s, the United Nations High Commissioner for Refugees (UNHCR) implemented a health education initiative in the camp with a focus on preventing the spread of HIV. The UNHCR volunteers engaged with the local community, provided refugees with resources, and taught them how to take advantage of what was available to them to prevent the spread of HIV. Participants were also encouraged to educate others about the dangers of HIV and help teach those around them about potential prevention strategies. These efforts reduced levels of HIV infection; now, the camp has far lower HIV infection rates than the surrounding areas of Zambia, proving the effectiveness of the program^[1]. Similar results were observed in schoolchildren in Thailand who engaged in a health education program to prevent the instance of head lice^[2]. Six schools were selected for participation in the study, and children (who were all females) were divided into control groups and intervention groups Figure 1. Baseline data on the presence of head lice was collected. After two months, the intervention group had significantly higher scores on a KAP (knowledge, attitudes, and practice) test, and the percentage of those with pediculosis (caused by a lice infestation) decreased from 59% to 44%. The control group, however, experienced no significant changes.

A recent study conducted by an epidemiologist at the Global Disease Detection and Response Program and supported by the United States Centers for Disease Control and Prevention (CDC) focused on studying the effects of a hand hygiene-based health education program on influenza and influenza-related disease rates among schoolchildren in Cairo, Egypt.^[4] The control group of students did not receive a health education program. The intervention group received a program that consisted of hand-washing requirements and educational activities related to hygiene. The program was taught in a creative and engaging manner to hold the attention of students and educate them about the importance of preventative hand washing and general cleanliness to combat germs. At the end of the study, school absences caused by influenza were reduced by 50% in the intervention group when compared with the control group,^[4] illustrating the effectiveness of a well-implemented health education program on community health.



Figure 1: Maatai women participate in a health education program created by the Unite the World with Africa Foundation, focused on sanitation, family planning, nutrition, HIV/AIDS, and more^[3]

Health education programs are beneficial for more than preventing the spread of disease. They can be used to maintain health, improve cognitive functioning, and increase healthy behaviors. In Iran, a study was conducted to determine the effects of a health education program on the overall health and glycemic control of patients with type 2 diabetes. The study found that all clinical measures and lifestyle factors that were evaluated improved in the health education group when compared with the control group.^[5] These findings were crucial because they established that rehospitalizations and complications arising from chronic conditions were not necessarily hindrances for patients. Similar programs could reduce strain on the healthcare system and are discussed in detail below. Another study evaluated the effects of a health education program in improving the cognitive capabilities of elderly participants in a University of the Third Age (U3A) program. The study found that health education program participants had significantly improved their cognitive examination and memory domain scores when compared with control group participants.^[6] These results suggest that health education can expand beyond its traditional uses. The use of cognitive health education to improve the cognitive functioning of older adults could be used to combat the adverse effects aging has on memory, fluid intelligence, learning, and problem-solving, which is extremely promising. Cognitive health education programs are an important consideration for future health education research.

The *International Journal of Dental Hygiene* published a 2017 study that described the efficacy of oral health education programs among varying age groups. After conducting a systematic review and meta-analysis of 11 studies on the subject, it was apparent that oral health

education programs and interventions led to increases in dental visits and improvements in brushing and flossing. These effects were often observed in children but were also observed in adults.^[7] It is clear that health education programs lead to an increase in knowledge and behavior alike, changing the perceptions and practices of patients. They can be used to increase healthy behaviors in even skeptical or reserved patients.

Health education programs can also be utilized to prevent chronic illnesses, improve overall population health, and reduce the burden conditions like obesity and osteoporosis can place on underfunded healthcare systems. A 2017 study researched the impact of a targeted health education program on the lifestyle habits of middle-aged women at risk of osteoporosis.^[8] The study concluded that the women in the intervention group who received a health education program had increased levels of physical activity, an increased daily calcium intake, and increased levels of general knowledge of osteoporosis. Although the progress of the study participants was not tracked in the long term, it is plausible that these changes in lifestyle habits could have delayed or even prevented the onset of osteoporosis in some of these women. Engaging citizens with predispositions to such diseases using programs for diabetes, obesity, and even cancers could be extremely beneficial in both the short and long term.

A 2019 review analyzed studies focused on health education programs designed to promote maternal and child health.^[9] The study focused on 23 articles on various educational methodologies or program designs and technologies. Educational programs focused on various topics, including breastfeeding and pediatric dentistry. The programs yielded an abundance of positive results, including increased confidence, increased birth weight and gestational age at birth, increased prenatal visits to ensure fetus health, and higher rates of safe behaviors during pregnancy (avoiding alcohol, nicotine, drugs, etc.). The review concluded that continued health education programs led to improved outcomes for both the mother and child.^[9]

Poor menstrual hygiene, caused by period poverty, can lead to a variety of negative effects on one's physical health, including urinary tract infection (UTIs) and issues with the reproductive system (UNICEF). In areas where girls are already marginalized in schools, and where many young women skip classes when they menstruate, infections caused by unhygienic practices can take a significant toll on both a young woman's education and her daily life. Many poverty-stricken areas do not have resources such as transportation, pharmacies, and healthcare infrastructure, and home remedies can often be more harmful than helpful. Thus, eradicating

dangerous practices like poor menstrual hygiene is imperative. In 2007, a study measured the impact of a community-based health education program on the menstrual hygiene practices of adolescent girls in India. The researchers found that the health education program increased awareness of menstruation and led to a 28% decrease in the unhygienic reuse of cloth and menstrual products,^[10] which in turn improved the reproductive health of adolescent girls in 23 villages.

Health education has been associated with a reduction in risky behaviors and an increase in academic achievement.^[11] Additionally, it can help change the attitudes citizens have towards infectious diseases. Between 2012 and 2013, a study conducted in Gansu, China, recorded differences in knowledge of the spread of infectious diseases between two groups of high school students.^[12] Although education level, income, and gender also affected the results, education had the most significant impact. Those in the intervention group exhibited more cautious behaviors after a health education program.

Among older students, health education programs can improve sexual health and reduce instances of violence and the abuse of certain substances. Often, these programs can involve more than classroom instruction. Programs with multiple components, including parental and community involvement and changes in school policy,^[13] can have a positive effect on sexual safety, nicotine abuse, and bullying in school. Evidence suggests that when compared to other measures such as anti-smoking policies and a targeted approach towards 'at-risk' students, school-based health interventions and education programs have a greater positive impact on student health.^[13] Similarly, a Japanese study with the goal of measuring the effect of a comprehensive alcohol-focused health education program on alcohol abuse among junior college students found that the program reduced instances of alcohol abuse among the primarily female study group, despite limitations to the research.^[14] Combating risky behaviors through education rather than the systematic targeting of students who are perceived to be at risk is a more beneficial approach.

At times, health education programs can encompass education in nutrition, particularly in areas where it is difficult to control one's meals and readily obtain foods that provide the variety and nutrition that characterizes a healthy diet. Exploring the impact of health education on food sourcing behaviors is a key step when determining how to best combat the obesity epidemic through the people suffering from it. A 2015 study measured the effects of a nutritional health education program on the knowledge and behavior of primary school students

regarding nutrition in two low-income counties in China.^[15] Students in the intervention group had increased behavior and knowledge scores, suggesting that the health education program had an impact on the way they approached food and food safety. Attitude scores, however, stayed relatively consistent.^[15] In Spain, researchers found that physical activity and nutrition education programs yielded positive results and increased acquisition of healthy behaviors.^[16]

Evidence has suggested that health education can become a vital aspect of therapy and recovery for patients with physical and mental conditions. A review examining the effects of health education programs on treatment outcomes in patients with heart failure analyzed several studies on the subject.^[17] The studies that were analyzed measured a variety of variables, including the impact of health education on the quality of life of the patient, the patient's knowledge of their disease, the patient's level of self-care, and the patient's adherence to any pharmaceutical prescriptions recommended by their physician.^[17] Data suggests that health education increased patient knowledge about heart failure, and had a significant impact on the patient's adherence to medications.^[17] This suggests that health education programs could be used further to influence lifestyle changes in patients suffering from chronic illnesses. These programs would reduce rehospitalizations and patient health, thereby preserving healthcare resources.

The world is also currently facing a mental health crisis, with levels of anxiety and depression skyrocketing among groups of all ages, and particularly among young people.^[18] Mental health awareness and education programs have the potential to reduce the stigma around mental illnesses and improve the overall mental health of students. Health education programs can also reduce risk factors of mental illnesses. For example, they have been utilized to combat drug addiction^[19] and teen pregnancy: factors with a significant impact on the mental health of young adults. Although many of these programs are in their early stages, they could have a positive impact on the mental and physical health of young people by reducing stigma and rates of anxiety and depression.

Modern students live in a technological era in which cell phones, tablets, computers, and video games are core elements of daily life.^[20] Thus, it is necessary to digitize programs that focus on student mental health and wellbeing. Digital programs and educational games could increase student health by presenting material in a more engaging, relatable, and convenient way. A 2019 review evaluated the impact of digital mental health interventions (internet resources and apps focused on educating users about mental health maintenance) on the psychological wellbeing of college students.^[21] The

review analyzed approximately 89 studies and recorded a common trend of improvement in symptoms of anxiety and depression, as well as improvement in the overall mental health among students. However, researchers noted that more rigorous studies were needed to fully measure the impact of these programs.^[21] Making digital health education programs free and widely available is necessary. Ensuring that these programs meet established standards and are scientifically accurate is a significant challenge that must be met with extensive research.

The shift towards digitized health education has given rise to methods intended to educate students more creatively. Researchers designed a sexual health education game-based program for adolescents. The goal of the program was to combat unhealthy sexual behaviors, educate young people about safety and prevention practices, and encourage young people to discuss sexual health matters.^[22] The game program was anonymous, allowing students to learn topics without fear of social pressures or stigma.^[22] Programs like this emphasize learning through interactive activities and educate students free from the biases and reservations that traditional sex education teachers may have. They can also be utilized in areas where levels of STIs (the most common being HIV and chlamydia) are high to educate adolescents about safe practices.

The path forward: Suggestions for future work in health education and health promotion

Many educational institutions have implemented education and prevention programs for students that are intended to curb the usage of drugs and alcohol. Although similar programs focused on nicotine have been successful, programs that target 'at-risk' students and focus on drugs have largely been unsuccessful. Genetics play a large role in the susceptibility of many to drug and alcohol abuse. Current health education programs do not account for this fact and are not tailored to each student's needs, background, and learning style. Research exploring the nuances of health education relating to the prevention of substance abuse is necessary.

Health education can play a major role in reducing stigma around conditions such as mental illness and AIDS, thereby reducing reservations among patients who avoid seeking care due to the judgment they could face from their peers. Research on widespread health education campaigns has occurred; however, their efficacy must be further investigated. Navigating cultural and social barriers could serve as significant challenges for such programs; thus, prevention strategies must be researched as well. The implementation of stigma reduction programs would likely improve the standard of care for marginalized patients, thus positively impacting global health.

There are multiple health education models that must also be taken into consideration. Thus far, the rational model is the most promoted of the available models. Focusing on presenting unbiased information, this model is based on the belief that becoming educated on a subject will change a person's behavior. However, this is not always the case. The health belief model emphasizes the fact that people often make irrational decisions when it comes to their healthcare, regardless of the educational resources available to them; many prefer to live in blissful ignorance rather than face the fact that one has a terminal illness. Hypochondria, low self-efficacy, and perceived obstacles can serve as barriers to healthcare. The extended parallel processing model takes a more biased and emotionally charged approach to health education in order to strongly persuade people to take charge of their own health and practice better prevention strategies. These theories are crucial for the development of a health education program that balances science and education, with successful management of the often erratic and unpredictable behavior of patients. Future studies must consider which combination between the available models is the most effective, both in the short and long term.^[23]

Behavioral theories have been helpful to psychologists and sociologists when determining the best methods of education and persuasion for the general public. Social learning theory describes the idea that people are disproportionately impacted by their environments. This is crucial to note; health education programs must vary depending on the area and the cultural background of the people partaking in the program. Different strategies will work in different populations, and future studies must take this into account.^[24]

Currently, citizens with disabilities (physical and intellectual alike) are discriminated against in the workforce. In fact, the unemployment rate for those with disabilities is over two times that of those without disabilities.^[25] Health education programs can be utilized for sensitivity and diversity training in various corporations to emphasize the importance of reducing discrimination against potential employees with disabilities. Establishing mandatory programs focused on educating company employees about common disabilities such as autism and Down's Syndrome, for example, could increase levels of understanding and empathy, and lead to a more inclusive work environment. Studies have repeatedly correlated employment and reemployment with better physical health.^[26] Those who are employed have higher levels of security and better mental health because of the lack of stress caused by financial instability. Thus, employing more citizens with disabilities would likely have a positive impact on global health by increasing the physical and mental well-being of a marginalized population.^[27]

The United States and other nations are suffering from epidemics of obesity, heart disease, cancers, and diabetes. The onset of such diseases can be prevented by a reduction in inflammation and the maintenance of a healthy bodyweight and diet, along with stress management techniques. These lifestyle factors can be instilled into students at a young age, thereby vastly improving global health. Currently, most school-based health education programs are limited to substance abuse prevention and family life education or sex education. Health education programs in mindfulness, nutrition, and effective exercise routines can help improve the overall health of student populations. Current literature has suggested that theory-based interventions could reduce the risk of those who are predisposed to cardiovascular diseases.^[27] Because such programs have not been implemented in most public-school systems, research into the nuances and standardization of this type of curriculum is crucial.

Health education programs must be used to empower patients to make their own decisions about their healthcare. Thus, tailoring programs according to the type of intervention and end goal is necessary, as differing program formats can yield different outcomes.^[28] The same is true for the type of theory used.^[29]

This study conducted a systematic search of PubMed and Medline databases to identify 42 studies that were published after 1990 in English, and that focused on implementing novel health education programs. Priority was given to studies that had digital components, focused on cognitive science, or focused on rehabilitation and recovery rather than disease prevention (although some studies discussed also focused on disease prevention). Many of the studies used were discussed in an in-depth literature review, and findings were synthesized into suggestions for future work to streamline, modernize, and greatly improve health education practices.

This study is novel as it evaluates varying types of health education programs as they relate to health promotion beyond the widely known scope of health education. By discussing the relation of health education to mental health, cognitive functioning, digital healthcare, and supplemental care, this study places an emphasis on future research and discovery and provides valuable insights into a rapidly approaching era of health education rather than simply summarizing what is already known. Additionally, this study provides concrete, implementable suggestions for future research into a variety of aspects in health education.

Despite this, the study also has its limitations. There is a lack of adequate research regarding the potential cognitive benefits of health education programs, as the

concept is relatively new. Additionally, relevant research studies may have been omitted from the paper as a result of gaps in literature-searching practices.

Conclusion

Health education programs and advocates can help change the way we approach healthcare by championing preventative care to minimize the risk of chronic illnesses, outpatient care, and infections. They can also help reverse some of the negative effects associated with addiction and aging. Digitizing programs and utilizing flexible curriculums is particularly beneficial. As the world recovers from the COVID-19 pandemic and the current healthcare system is reevaluated, health education programs are a crucial consideration that can have a tremendous positive impact on the lives of citizens around the world.

Ethical approval

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Conflicts of interest

The author declares no conflict of interest.

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