

Implications for Health Management Through an Analysis of Changes in Life Patterns of Generation Z College Students Experiencing the COVID-19 Pandemic: A Qualitative Study

Myoung-Lyun Heo¹, Yang-Min Jang²

¹Department of Nursing, Jeonju University, Jeonju-si, Jeollabuk-do, South Korea; ²Department of Nursing, Shinsung University, Dangjin-si, Chungcheongnam-do, South Korea

Correspondence: Yang-Min Jang, Department of Nursing Science, Shinsung University, 1, Daehak-ro Jeongmi-myeon, Dangjin-si, Chungcheongnam-do, 31801, South Korea, Tel +82-41-350-1346, Fax +82-41-350-1345, Email sellrymin@gmail.com

Purpose: This study examines the radical changes in the everyday life patterns of Gen Z college students and their health-related perceptions in the online era.

Patients and Methods: Twelve Korean college students in their 20s attending online classes were included in this study. Online video interviews were conducted between September 2021 and January 2022, and content analysis was performed on the one-on-one interview transcripts.

Results: Four main categories and ten subcategories were derived from the data analysis: (1) living in a mobile world, (2) new lifestyle transcending time and space and adaptation to the change, (3) expansion of the meaning of health, and (4) interest in health and health management.

Conclusion: Gen Z college students have quickly adapted to the convenience of a non-face-to-face lifestyle, and their perceptions about health and methods of health management have also changed accordingly. Correspondingly, for the new generation of university students, providing customized health care that reflects the lifestyle of using mobile devices and includes self-management areas is necessary.

Keywords: Gen Z, online era, nursing, interview

Introduction

With the advent of the Fourth Industrial Revolution (4IR) anchored in the advancement of information and communication technology (ICT), a variety of sectors have prioritized developing adequate competence to face the 4IR wave and explored future directions even before the outbreak of the coronavirus disease 2019 (COVID-19) pandemic. Accelerated by the pandemic, the 4IR wave has ushered in a full-scale online era.¹

Initially, people found it difficult to adjust to the concept of the online and digital era; however, over time, they gradually realized the increased convenience resulting from the ongoing technological advancements and adapted to the change. The pace of change and development was notably fast in the field of education, contributing to the quick adjustment of both teachers and students to the new form of teaching and learning. Among the learners, college students may be the age group most affected by this change in terms of their daily routine and lifestyle.

College students, who are mostly in their 20s, have to go through a period of multifaceted changes in their lives, even if the COVID-19 pandemic had not occurred. They need to become independent for study reasons and adapt to a new environment.² They have more autonomy over their time along with more responsibility, which leads to changes in their lifestyle and the formation of new lifestyle habits. These changes may be accompanied by increased health-threatening

behaviors, such as drinking and smoking, coupled with a low level of personal health responsibility, which becomes the blind spot of their health management.^{3,4}

Nevertheless, people in their 20s are called “digital natives”, or Generation Z (Gen Z) as they are familiar with the use of mobile devices since birth.⁵ They are digital savvy, individualistic, spontaneous, and convenience-seeking,⁶ they are also characterized by sensitivity to changes and trends as well as known for their prompt acceptance of the change. Therefore, they are the generation that can most readily accept and adapt to the sudden dominance of Internet-based routines, amplified by the 4IR and the outbreak of COVID-19, to create new lifestyles and characteristics.

According to Rogers' Science of Unitary Human Beings, humans and the environment form an open system through interaction, and human behavior patterns responding to the changing environment evolve toward integrality characterized by helicy.⁷ Before COVID-19, healthcare-related programs for college students were focused on obesity prevention, smoking and alcohol prevention, mental health, and sexual education,⁸ but with the sudden change in the environment due to COVID-19, humans likely evolved by developing lifestyles that could adapt to this change. Hence, it is crucial to understand the characteristics of the changed daily lives and the health-related perceptions of Gen Z students in order to provide a direction for health management services in the new normal by setting new standards.

In this context, this study was conducted to obtain basic data for establishing the role of nurses as health managers by understanding what health means to Gen Z college students thriving in the online era and the association between their changed everyday life patterns and health problems.

Research question: What are the points to be considered in the provision of health management/health management care for Gen Z college students living in the online era?

Research Questions

This study aimed to examine the changes in the everyday life patterns of Gen Z college students and their health-related perceptions during the online era so that the health management profession could correspondingly provide the requisite care under the changed circumstances.

Materials and Methods

Design

This study is based on the research methodology of content analysis to analyze the statements of Gen Z college students in relation to changes in their everyday life patterns and health in the wake of the COVID-19 pandemic and to explore the underlying meaning thereof.

Sample

Participants comprised Korean college students in their 20s. An online recruitment advertisement was posted, and those who applied through the advertisement were selected through purposeful sampling. Those who understood the study's purpose and voluntarily agreed to participate in the study were selected according to the researcher's judgment to represent a population covering academic situations in various majors. The final number of study participants was 12 (nine women and three men), and their general characteristics are presented in [Table 1](#).

Measures

Data for this study were collected through one-on-one interviews from September 29, 2021, to January 7, 2022. Interviews were conducted through online platforms such as Zoom and Google Meet in the time slot selected by each participant. Each interview session lasted between 40 and 80 minutes, and each participant was interviewed once or twice; this procedure continued until data saturation was achieved. Each session was recorded with the consent of the participant, and the recording was checked and transcribed for data analysis. In the data analysis process, parts with unclear or insufficient information were additionally reconfirmed with the participant by phone, text message, or social media.

Table 1 Participants' Characteristics (n = 12)

PIC*	Sex	Age	School Year	Major
Participant 1	1	23	3	Arts, Business Management,
Participant 2	1	21	1	Computer Engineering,
Participant 3	2	26	4	Mechanical Engineering,
Participant 4	1	23	3	Confectionery and Bakery,
Participant 5	1	20	2	Physiotherapy, Public
Participant 6	1	22	2	Administration, Nursing
Participant 7	1	21	2	Science, Computer
Participant 8	1	20	1	Engineering
Participant 9	2	25	4	
Participant 10	1	21	1	
Participant 11	2	25	4	
Participant 12	1	21	2	

Notes: *Participant identification code; Sex: 1=Female, 2=Male.

The interview questions were selected by two professors of health management with experience in qualitative research, and the readability and adequacy of the questions were checked by two doctors in health management practice (DNP), followed by a revision of the questions based on their feedback.

The final list comprised five open-ended questions: “Are there any changes in your daily life that you are personally experiencing due to COVID-19?” “Is there any change in your health status due to the changes in your daily life?” “What according to you is the definition of health?” “Are there any environmental factors that make healthy behavior difficult?” and “What do you think is necessary to improve healthy behavior?”

Analytic Strategy

The data were analyzed using the inductive content analysis method proposed by Elo and Kyngäs,^{9,10} and the detailed analysis process is described below.

In the first step (open coding), the transcribed material was read through first, and several times thereafter, during which meaningful sentences or phrases related to participants' everyday life patterns or health were selected, labeled with headings in the coding sheet, and developed into categories. In the second step, the list of categories generated after the open coding process was grouped into broader higher-order headings. In the third step, similar subcategories were condensed into the same category, and the categories were grouped into a larger group, whereby a general interpretation was attempted. This inductive process resulted in the extraction of four categories and ten subcategories.

Ethical Considerations

The study was approved by the Institutional Review Board of Jeonju University (IRB No. jjIRB-210812-HR- 2021-0807) prior to the initiation of the study to ensure participants' privacy and anonymity. This study was conducted in compliance with the Declaration of Helsinki. Participants were selected from among those who showed an interest in this study and volunteered to participate. On agreeing to participate after being informed of the objectives and procedure of the study in detail, the selected participants were provided a detailed explanation of the objectives and procedure of the study, audio-video recordings of the interviews, a guarantee of their anonymity and confidentiality, and were informed of their right to withdraw their consent at any time without incurring any disadvantage. Participants informed consent included publication of anonymized responses. They were also informed that all data collected would be used for research purposes only, stored as encrypted data under strict anonymity, and discarded after three years. They were enrolled in the study after submitting their written consent to participate. After the participation, they were given a small token of appreciation.

Rigor of Qualitative Research

The rigor of the study was ensured by meeting the criteria for establishing rigor in qualitative inquiries as proposed by Guba and Lincoln;¹¹ truth value, applicability, consistency, and neutrality.

To meet the criterion of truth value, the validity of the analysis results was tested by having three participants check whether the transcribed interviews and analysis results were in conformity with their experiences. To meet the criterion of applicability, data were collected until data saturation was reached by the confirmation of participants' repeated statements. Consistency was tested and found satisfactory by the two health management professors to whom the processes and results of central meaning and keyword extraction were explained. Finally, neutrality was established by minimizing meaning distortion attributable to the researcher's experience by precluding personal bias throughout the study procedure and performing analysis from the participants' perspective.

Results

The results of analyzing the participants' statements led to the derivation of four categories and ten subcategories (Table 2). The analysis results are presented in this section along with the participants' statements as below.

Living in a Mobile World

All Aspects of Everyday Life Linked with Mobile Networks

Participants' daily activities mostly consisted of consuming video or audio content on their mobile devices. They used a tablet for taking notes during classes or for doing assignments and learning from online video content. They said that they watched videos during meals or undertook fitness training at home (considering themselves as participants in a workout program) and sometimes even went to sleep with a YouTube ASMR (autonomous sensory meridian response) video on.

I watch YouTube videos while eating. It is a bit lonely eating alone like that. I have been told that many of my friends or classmates have their meals while watching video clips with people's sounds from the footage as their companion. (Participant 1)

Resting with a Mobile Phone

Even without any specific activity in mind, they watched YouTube videos or used social media while resting or spending leisure time. They spent more time than they realized staring at their phone screens, searching for content, or clicking on the clips

Table 2 Topics and Subtopics Derived from Participants' Statements

No.	Description
Topic 1	<p>Living in a mobile world</p> <ul style="list-style-type: none"> • All aspects of everyday life linked with mobile networks • Resting with a mobile phone
Topic 2	<p>New lifestyle transcending time and space and adaptation to the change</p> <ul style="list-style-type: none"> • Spending more time at home • More time for self-directed activities • Cultural changes • Satisfaction with and adaptation to the online environment
Topic 3	<p>Expansion of the meaning of health</p> <ul style="list-style-type: none"> • A state that allows one to concentrate on daily living • A health status based on the level of self-care
Topic 4	<p>Interest in health and health management</p> <ul style="list-style-type: none"> • Interest in health and information from the internet • Need for personalized information

recommended by algorithms that reflect their search or viewing history. They said that such content helped them get enough rest because the content was interesting and the act of spending time with their mobile phone was comfortable for the body.

Watching YouTube videos on my phone comes in handy because when I log in to watch a fitness exercise video, algorithms show a bunch of other interesting exercise videos, and time seems to fly while watching them one by one. (Participant 12)

To be frank, when I use the phone for a long time, I feel like I am getting some rest because it is rather entertaining rather than a rest for my body in the true sense. My eyes get a little tired, but it does not leave me time to think about anything else, so I feel that my brain is resting. (Participant 12)

New Lifestyle Transcending Time and Space and Adaptation to the Change Spending More Time at Home

Participants shared that they spent more time at home because their classes were held online most of the time and they did not have to leave home to go to college. With the space for study and rest overlapping, they spent most of their time lying down or sitting.

While listening to the teacher in an online class, the bed looks so warm, and I am tempted to lie down for a while ... So, I go straight to bed after class ... yeah, it goes like that because the bed is right in front of my eyes. (Participant 1)

More Time for Self-Directed Activities

Participants expressed their satisfaction with online classes because they could save commute time, which made it easier to manage their own time and left them with more spare time. They had more time to spend doing things that mattered to them depending on the conditions of the day and their life patterns.

Lectures are uploaded after about noon. I have the habit of doing things assigned to me well in advance, such as listening to lectures. So, I listen to the lectures as early as possible. In the afternoon, I spend the time scheduled for class hours on other personal affairs. For example, I try and learn something else or do anything I need to do. (Participant 10)

However, since online classes, unlike traditional face-to-face classes, do not require one's physical presence, participants did not maintain any fixed time for sleeping, waking, and eating, which led them to experience difficulties in self-management. Therefore, as their autonomy increased, they felt a growing sense of insecurity.

With nothing imposed on me, I feel I have been a bit neglectful of my work and in managing my life. Sleeping late, waking up late, and eating whenever I am hungry and skipping meals when I am not hungry. I do not bother to get something to eat when I am busy or feeling lazy. (Participant 4)

Cultural Changes

The pandemic-induced restraints on face-to-face classes and the use of outdoor facilities reduced students' opportunities for meeting during school activities and hanging out with friends; they had to spend more time alone at home. As a result, a new normal of non-face-to-face culture was born, wherein students meet friends via online video programs to talk and learn together.

I rarely physically meet up with my friends to play. Instead, we meet and play online in the evenings or on weekends with cameras turned on. (Participant 12)

We meet in a Zoom room and show others what we are learning, in the mute mode. This way, we motivate one another and study late into the night. (Participant 10)

Satisfaction with and Adaptation to the Online Environment

With the non-face-to-face lifestyle becoming an integral part of their daily routine, participants adapted to the change with satisfaction on the grounds of saving transport costs, stress reduction from less competition, and higher learning efficiency.

In the past, I was overwhelmed by the peer competition, and it was the greatest stressor for me. I used to think, “Look how well she is doing. I should be as good as her” ... Now we have become kind of a one team, and I tend to think, “both of us should be doing good”. So, I am no longer depressed. (Participant 1)

I wish online classes will continue until I graduate. (Participant 3)

Expansion of the Meaning of Health

A State That Allows One to Concentrate on Daily Living

Participants considered health to be a state of having no physical discomfort or disease, allowing them to carry out physical activities without much difficulty and having no difficulties in performing daily life activities. For them, maintaining a balance between physical and mental health was also important because they considered health to include a mental state of being able to focus, with the mind at ease and happy.

I think we are healthy when we can lead a normal and regular life without any physical discomfort. (Participant 9)

The state of only being able to move the body to do what has to be done cannot be said to be a healthy state. Personally, I think that doing any task with 100% concentration is a healthy state. (Participant 3)

Health Status Based on the Level of Self-Care

Participants believed that health was a state of being able to do things they want to do well by concentrating on the target task with a focused mind and efficient self-management.

Many people exercise regularly and continuously or eat only natural food. Such self-care seems to be the first step to health. There are people from whom I feel have something to learn when I talk with them, and I usually feel that they are healthy. (Participant 1)

However, counterbalancing the increased leisure time with staying up all night or oversleeping, the participants found it difficult to lead a disciplined life and, therefore, suffered from poor concentration, a sense of helplessness, and a long-lasting feeling of fatigue.

It may be something quite natural, but I feel like I am just catching up with the class schedule, and that is all there is. If there is a class now, I eat later or earlier, and if I have to do an assignment then, I stay up late into the night and take a nap during the day. Things change like that. (Participant 1)

I feel tired every day. More than anything, I keep thinking that I am too tired to do anything. (Participant 6)

Interest in Health and Health Management

Interest in Health and Information from the Internet

The participants were interested in their health status, and when they felt they had health problems or health-related questions, they tended to get the information they needed through an Internet search instead of visiting the doctor. Nonetheless, they said they wanted to get accurate information about health management, although information from the Internet may not always be reliable.

I was ashamed to talk about a strange symptom I had, and I did not go to the hospital to get it examined. When I roughly looked it up on the Internet, it seemed to be a blood pressure problem. It was then that I realized that my condition could be serious. (Participant 4)

There appear to be a lot of paid commenters, too. There are websites that offer rewards for writing favorable reviews. This is why we do not trust online reviews. (Participant 7)

Need for Personalized Information

Being recipients of information about daily health management, such as exercise and diet plans, which was meant for the “general public”, the participants were not sure whether they were on the right track and wanted to consult experts to discuss questions they had and get proper answers.

During exercise, I am often forced into a weird posture, and if something goes wrong, exercising can actually have harmful consequences. So, I think it would be surely helpful to meet an expert in person and get help with posture correction. (Participant 10)

Participants who had sufficient parental support were indulged with meals and exercise, but those who lacked parental support expressed their reluctance to indulge in high-quality meals or plan exercise routines due to the economic burden involved, indicating the polarized economic situation among Gen Z students.

At first, I skipped meals because of a lack of money. Going to the gym to stay healthy also costs money. (Participant 8)

Discussion

In this section, we discuss the implications on health management in terms of health management in the new normal post-COVID-19 era by analyzing and identifying the changes in the everyday life patterns of Gen Z college students caused by the online era, which they are quick to adapt and accept.

First, Gen Z college students spend most of their time using mobile devices. Currently, college students in their 20s are digital natives who have been exposed to a digital culture since birth. Consequently, they are highly mobile-dependent and closely connected to the digital world, unlike other age groups.⁵ In addition to these characteristics, the participants of this study spent most of the day attending online classes and doing assignments, with social distancing and online activities becoming the norm after the declaration of the COVID-19 pandemic; this resulted in increased time spent using mobile devices.

Their daily activity patterns were observed to be continuously associated with mobile devices. This included watching video content on platforms such as YouTube, not only during class hours but also while having meals or exercising. This reveals patterns of one-way exposure to video footage, away from interpersonal interactions, in an environment with reduced opportunities of physically meeting with others. The participants mentioned that they turn on Netflix or YouTube even while eating “because I hate silence”. This can be interpreted as a behavioral pattern arising from feelings of loneliness and the desire to be with people without physically being in the same space as them. It can be understood in the same context as the research finding by Kim and Jung that loneliness is a major factor in developing smartphone addiction.¹⁰

Loneliness causes not only mental but also physical health problems such as cardiovascular disease and aging, as reported in previous studies.^{12,13} Prior studies have mostly associated loneliness and health problems among older adults and other groups of people with reduced opportunities for social contact.¹⁴ However, under the current circumstances, where social contact has decreased due to changes in the social environment, it is necessary to extend the scope of research to include young people who are highly dependent on mobile devices.

Furthermore, the participants spent most of their leisure time watching videos on their mobile phones or using social media, believing that they were taking a break. Rest is a condition necessary for maintaining health, a process of overcoming physical and mental fatigue, and a state of relaxation. It is also defined as a “temporary pause of activity”.¹⁵ However, since people living in the mobile era show a behavioral pattern of using mobile devices for activities as well as for rest, additional research is needed to test whether it can actually be interpreted as rest in the sense of pausing activity.

Second, Gen Z college students were found to enjoy and adapt to Internet-based life patterns that transcend time and space. Most of them reported that their sitting and screen time increased significantly after the outbreak of the COVID-19 pandemic.¹⁶ In a study conducted in Korea,¹⁷ which analyzed the level of physical activity in college students, an age group that usually has a higher level of physical activity, most of the participants were found to have minimal or no physical activity, corresponding to the finding of this study.

Nevertheless, the participants were found to adapt significantly well to the changing everyday patterns and were satisfied with the time saved from travel and from unnecessary outdoor activities. Park et al,¹⁸ who compared college students' leisure activities before and after the outbreak of the COVID-19 pandemic, reported that while activities requiring physical contact with others, such as sports, culture, and art events, saw a decline, individual activities, such as playing games and watching TV or other media, increased. Additionally, this study revealed that the need for interaction with others gave rise to online play culture in which friends get together using online video platforms to study, exercise, and talk.

Roy and Andrews defined adaptation as the product of feelings that people have in the process of creating human and environmental integration and choosing to do so, noting that the goal of environmental integration is adaptation.¹⁹ In this regard, given that social distancing and the environmental shift to a non-face-to-face lifestyle brought on by COVID-19 have led to new emotions in people and driven them to a different level of effort toward environmental integration, the life patterns to which they have adapted will not change easily in the post-COVID-19 era. Therefore, reduced opportunities for interpersonal relationships induced by a non-face-to-face lifestyle and lower physical activity levels should constitute key factors to be considered in the health management practice of the future.

Third, Gen Z college students perceived a healthy state to be that where one has the ability of self-management to focus on work. The most widely accepted concept of health is the definition formulated by the World Health Organization (WHO): "physical, mental and social well-being, not merely the absence of disease or infirmity". However, given the relative and ambiguous nature of a "state of well-being", the interpretation of this definition may differ among different individuals and groups.²⁰

The participants in this study also considered health to be a state without physical disease and mental problems, not unlike the common definition of health. Along with this traditional concept, they also described health as a state that allows them to concentrate on any given task and to do the things they would like to do. This may be reflective of generation-specific characteristics, as noted by Sung that beliefs about health vary from one group to another.²⁰

Among the global economic development models, the term "me-economy" refers to consumers who value themselves,²¹ and at its heart is Gen Z, who grew up in an environment of information technology and information revolution.²² Placing greater value on the present than a distant future and taking more interest in personal growth to create a better self-image compared to that of yesterday, they are characterized by the desire to bring qualitative changes to their lives through self-development and are hence naturally attracted to keeping healthy based on self-management.²³ Accordingly, instead of paying attention to Gen Z's self-management by perceiving them as major consumers from an economic perspective, more attention should be paid to the health management aspect of self-management.

Furthermore, in the post-COVID-19 era, with increased personal free time in the online communication environment, released from spatiotemporal constraints, the role of health managers needs to be discussed from the perspective of time management or self-management, considering health problems that may arise from increased fatigue or decreased concentration caused by irregular lifestyles or lack of self-management.

Fourth, Gen Z college students are interested in their own health and require personalized management through individual consultation with health professionals. The term "healthy pleasure" was coined in the wake of COVID-19. With this expression and considering it a noteworthy trend, Gen et al described the characteristics of the young generation that considers health management enjoyable and wishes to retain it on a long-term basis. The participants in this study also showed keen interest in their health and used YouTube or other search engines frequently to obtain health information. However, they were not sure about the reliability of the information on health management; thus, obtained and regretted the lack of opportunity to consult a professional health manager.

College students in their 20s are not economically independent; they have to meet their financial needs by relying on parental support or by working part-time. Analyzing the participant characteristics revealed the polarization between students with and without parental support. While the former were managing well in terms of diet and exercise and could consult professionals if needed, the latter's strained budgets did not permit them to enjoy nutritious meals or engage in desired exercises.

The cost of practicing health behavior can prove to be an obstacle to health-promoting behavior.²⁴ Therefore, young students who are on the threshold of adulthood and have not yet attained economic independence should be provided with professional health education or management support by the university or local community as a welfare measure. In

this context, it is necessary to develop a wide range of programs that consider health as a concept embracing physical and mental health as well as self-management.

Before COVID-19, chronic disease prevention programs for young adults were focused on obesity prevention, smoking and alcohol prevention, sex education, and mental health promotion. Furthermore, the health problems of young adults have received much focus and remain important even now. This study's results demonstrated the reduced opportunity for social contact and level of physical activity among young adults due to increased mobile usage time and life adaptation to non-face-to-face activities. These results highlighted the need to expand research on health problems related to loneliness to help improve opportunities for social contact with others. Additionally, the increasing use of mobile devices can result in excessive information flow and multitasking between work and rest, leading to inappropriate self-management due to fatigue or poor concentration. Therefore, various customized health management programs should be developed to help individuals get adequate rest and sleep. Furthermore, since young adults play a pivotal role in supporting the next generation, policy support should be provided in various ways to increase young adults' interest in health care.

Strengths and Limitations

This study's major strength lies in deriving significant implications for resolving the health problems of young adults, who adapted flexibly to the rapidly changing environment brought about by the pandemic and technological advancements. However, its results have limited generalizability for two reasons. First is the small sample size. Second, the primary concern of health management studies, such as the present study, is to conduct research on people's health based on their ongoing interactions with the environment.²⁵ However, despite the limitation, the results are expected to serve as a basis for further research on the healthy growth of future generations. Additionally, the generalizability of the results is expected to be confirmed by expanding the sample size to various countries and races in future research based on the results derived from this study.

Conclusion

The changes to Gen Z college students' everyday life patterns, which involve spending all of their time using mobile devices, including time for meals, exercise, study, leisure, and rest, are indicative of a new routine transcending time and space. With new patterns, there is a corresponding increase in the importance of self-management and practicing health behavior. Although the participants were in their early adulthood, when they are generally healthy, they spoke about their interest in health and the need for health management. Therefore, health management policies and measures should reflect the changing meaning and management methods of health, as well as the changes in everyday life patterns, among the young generation. They should also reflect the generation-specific characteristics that arise from the young generation's interaction with the environment. Finally, customized health care that reflects the lifestyle of using mobile devices and includes self-management areas should be provided for the new generation of university students.

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Disclosure

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