

Changing Awareness about Health Behavior: A Study among Young Instagram Users

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This paper examines the usage of social media for changing health behavior among young Instagram users at a Malaysian public university. A qualitative approach was espoused to investigate this phenomenon. Face-to-face interviews were conducted among the selected Instagram users. Then, a thematic analysis was used to categorize the outcomes from social media application in changing awareness on health behavior among the Instagram users. The study is viewed from a social cognitive theory perspective, and the results demonstrate that all the Instagram users originally started changing their health behavior offline. This means the research participants' actions were initiated external to the digital media society; and their actions were mainly attributed to the self-awareness on unhealthy physical state. Later, with the use of Instagram, the participants were able to gather health knowledge and effectively achieve their goals to lose weight. The role of Instagram identified in this study was mainly to mediate the process for changing health behavior by providing a platform to search and share health information and to engage in social interactions by seeking feedback on health. This research contributes to behavioral science knowledge by revealing the role of Instagram as a mediator that enables health behavioral change among Malaysian university students.

Keywords: social media, social cognitive, behavioral change, university students, Malaysia

Knowledge of health, particularly physiological states, creates the precondition for an individual's behavioral change and affects lifestyle habits (Bandura, 2004). If people have enough knowledge about bad lifestyle choices that affect their health, they have reason to change their unhealthy behaviors. However, knowledge alone is insufficient to trigger changes in actions for most people. They need social influence from the environment to facilitate the change process. In brief, the knowledge and interactions between environment and behavior impact self-efficacy and personal cognition that are related to the social cognitive theory. In the context of health information exchange, the social cognitive theory states that an individual's health behavioral outcomes are determined by personal cognition or awareness and ability to interact with societal elements (Lin & Chang, 2018). Scholars (e.g. Bandura, 1998, 2004, 2009) have extensively applied social cognitive theory in health behavior studies and later in the social media context. The rapid development of social media sites over the last decade allows all groups of people to interact with each other by communicating and sharing information, including on health promotional activities (Field, Elbert, & Moser, 2012; Zhang et al., 2019).

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Today, social media sites like Facebook and Instagram have become the major sources of knowledge for helping members of modern society cope with their lifestyle. In fact, the number of social media users is expected to reach 3.02 billion worldwide by 2021 and one of the significant uses of social media could be to promote people's healthy lifestyle and improve people's management of their health status (Soheylizad & Moeini, 2019). Specific to Malaysia, a survey conducted in 2018 by the Malaysian Communications and Multimedia Commission (MCMC) found that majority of the Malaysian internet users, particularly the young users, shared content online via social media (61.8%). The survey reported that 97.3% of Malaysians are Facebook users, making it the most preferred social networking sites in the country, followed by Instagram with 57.0% users (MCMC, 2018). Although the overall number of Facebook users is greater compared to Instagram users in Malaysia, a social media users' trend for January 2019 indicated that Instagram was more popular among Malaysian young users, aged between 18 to 24 years old, with 31.9% compared to 24.4% Facebook young users (Instagram Users in Malaysia, 2019). According to Santarossa and Woodruff (2018), the use of social networking sites like Instagram has been increasing in health promotion initiatives because people feel more comfortable to communicate in their trusted and familiar existing networks.

In 2011, the World Health Organisation (WHO) reported that Malaysia had 44.2% overweight prevalence for adults of both sexes (i.e. body mass index of more than 25kg/m²). In the past eight years, the prevalence of obesity among Malaysian showed a continuing increase with 64.5% of the total population and is considered as the highest rate among Asian countries (World Health Organization [WHO], 2019). Specific to the context of Malaysian young people, a recent study conducted among Malaysian university students found that unhealthy food intake, social media use, and stress had significantly correlated in contributing to the overweight and obesity issues (Radzi et al., 2019). For the WHO, being overweight is a leading behavioral risk factor for non-communicable diseases like heart disease, stroke and cancer that have significant social, economic and health effects for individuals and the nation (Riley et al., 2016). Since being overweight is often a lifestyle-related disease, maintaining health behavior is an important strategy for overcoming this problem. Given this context, it is critical for social health actions to promote good health behaviors to reduce the overweight prevalence in Malaysia, particularly among young people.

Despite considerable research on social cognitive theory for health behavior, few studies have investigated the topic in the young Malaysian context via Instagram. For example, a comparative study conducted by Shukri, Jones, and Conner (2016) to investigate the predictors of health intentions such as vegetable consumption, low-fat diet and physical activity among Malaysian working adults was guided from the theory of planned behavior perspective. Although a study of Malaysian university students in relation to their health behaviors had been conducted by Dev et al. (2018), this study applied specific concepts like self-efficacy, emotional intelligence and spiritual intelligence as the main research focus rather than applying the whole social cognitive notion. This is also true for a study conducted by Ahmad Sharoni, Abdul Rahman, Minhat, Shariff-Ghazali, and Azman Ong (2018) among Malaysian elderly on healthcare behavior, examining specific self-efficacy effects that were lacking from a social cognitive theory viewpoint.

Therefore, focusing on a social media application, this study intends to fill the knowledge gaps by investigating the Instagram usage for health behavioral change among

youths at a Malaysian public university. The social cognitive theory was used as the guiding theory to study the young people in Malaysia and findings from this study are expected to contribute to a more comprehensive explanation on changing personal cognition and awareness on health behavior. This study is based on the work of Bandura (2004). Specifically, this study aimed (1) to identify and explore the factors that contribute in the usage of Instagram for health behavior change; and (2) how the interactions among personal cognition, environmental events and behavioral actions (i.e. based on social cognitive theory) affect the young generation to overcome health issue like being overweight. In meeting the research objective, a qualitative methodology was adopted and semi-structured interviews were conducted with Malaysian university students who used Instagram to overcome their overweight and/or obesity issues.

Literature Review

Health is a critical component of life and, therefore, it constitutes an important field of social science studies. Early studies on health concentrated on solving patients' medical issues, and later more research was conducted to explore public health issues such as obesity and to inform people of the consequences of their health choices (Cavusoglu & Demirbag-Kaplan, 2017). Today's modern society has increasing awareness of health behaviors due to the large amount of health information available online, including in social media sites. According to Cavusoglu and Demirbag-Kaplan (2017), the digital health phenomenon has shifted the medical intervention mechanism and many research avenues related to this field remain unexplored, such as the relationships between social media users and their family and friends for health behavioral changes.

Social Networking Sites

Social networking sites provide opportunities to communicate and connect with other online users. Through a social networking site like Instagram, people can share personal and professional interests, activities or any events that create a network of online contents and information. The application of social networking sites has many potential benefits if users make positive meaning and well-being from the social media contents (Clark, Algoe, & Green, 2018). For instance, people require information about health to help them cope with certain health related issues and easily search the information online through social media rather than going to meet friends or health personnel (Lin & Chang 2018). Social media makes it possible for the users to exchange personal health information with others and facilitate the users' health behavioral change.

According to Lin and Chang (2018), health information sharing over the social media is different from other information exchange behavior because it is closely related to the physical state of the users. In other words, users from a health-related social networking site expect to receive responsive outcomes in the forms of comfort, social recognition and self-evaluation. A content analysis of online communities conducted by Wang and Willis (2018) found that discussion about successful weight loss activities is more interactive and generate social support among the online members. Thus, social networking sites have been increasingly used as a major technological application in public health, particularly on health behavior change intervention. The advantages of social media have encouraged users in applying social networking application to mediate their positive health behavior change (Yang, 2017).

Health Behavior

Health behavior refers to a person's actions in relation to his or her health and well-being. Health-related behavior is an important component of public health and is associated with several common public health diseases, such as heart disease and diabetes. A good example is that eating food high in cholesterol may lead to overweight and having a stroke. However, changing health behavior is not easy because it requires continuous processes and practices embedded in social life (Kelly & Barker, 2016). For example, changing eating habits is not a one-off event that is easily triggered by getting information on healthy food intake. The eating behavior is part of a person's habit and ingrained in his or her lifestyle. To some extent, this eating habit defines who a person is and gives the person a sense of self. Developing a sense of self is a cognitively effortful process where a personal cognition (e.g. awareness) initiates deliberated behaviors (Gardner, 2015).

Sunitha and Gururaj (2014) conducted a review among young people aged 10 to 24 years old in India and concluded that about 30% of young people suffers from health-impacting behaviors that lead to being overweight and having obesity (a form of malnutrition) problems. Such problems arise from increasing dietary intake of foods that are high in sugar and fat in addition to the fast food culture. Peltzer et al. (2014) studied university students in 22 countries and found an association between being overweight or obese and health behaviors. Among the health behaviors examined in the study were the use of tobacco, low physical activity intensity and eating a fatty and high-cholesterol diet. The study emphasized the high prevalence of being overweight or obesity among university students and recommended that the university administration promote a healthy lifestyle among students (Peltzer et al., 2014).

One way to promote health behaviors among today's youth is through social media. The wide accessibility of mobile devices and social networking sites like Instagram creates opportunities for younger generations to use social media extensively. Although information in this digital age can have a negative influence on youth (e.g. unhealthy products consumption like fast food), positive health-promoting campaigns aimed at youth can highlight healthy eating and smoking cessation (Dunlop, Freeman, & Jones, 2016). Youths also feel that health information on social media is not necessarily reliable but is highly relatable to them (Fergie, Hunt, & Hilton, 2013). For example, Instagram has both educational/informational and motivational/supportive applications where social interactions and self-expression are among users' primary motives (Kamel Boulos, Giustini, & Wheeler, 2016).

Scholars have increasingly emphasized the close link between social networking sites such as Instagram and the regulation of self-concept on health behaviors among college students (Wilson, Knobloch-Westerwick, & Robinson, 2018). According to Wilson et al. (2018), there were mixed views on the roles of social networking sites, which either play an active role in shaping the users' self-concept or serve as a mediator role, where self-concept is most influenced by comments from friends or other users. Either way, the more individuals think (or have cognitions) about recommended health behaviors (e.g. healthy food intake), the more they select or post messages promoting health behavior change (Wilson et al., 2018).

Social Cognitive Theory

Generally, theories on behavioral change suggest personal, environmental and behavioral characteristics as the major factors in changing a given behavior. One of the most

relevant theories for explaining health behavior change is social cognitive theory. Over the years, there has been constant interest in the application of social cognitive theory in the area of health promotion (Bandura, 1998; Sarkar et al., 2018). Sarkar et al. (2018) argued that social cognitive theory can explain the bidirectional causation among personal factors (mainly in the form of cognitive and affective thoughts), environmental events and behavioral patterns. When applied to social media communication, the interactions among these three major factors are rapidly diffused through the individuals' social networking.

Based on social cognitive theory, behavioral change is regulated by personal, environmental and behavioral factors that affect each of the others. In health promotion practices, Bandura (1998) posited that personal beliefs operate in parallel with cognized goals, perceived environment and facilitators in the regulation of a person's behavior and well-being. Thus, social cognitive theory suggests three interdependent factors:

- Personal – whether the individual has high or low awareness or thoughts toward the behavior.
- Environmental – aspects of the setting that influence the individual's ability and thoughts to successfully complete a behavior.
- Behavioral – the response an individual receives after he or she interacts with the environment.

Personal factors. Personal factors refer to cognitive, awareness, affective or biological properties of individuals that can affect their judgements and capabilities to take certain actions (Kim, Lee, & Elias, 2015). Good judgement and capabilities would influence personal efficacy to organize and execute courses of actions required to achieve expected outcomes (Bandura, 1998). According to Bandura (1998), self-efficacy enhances personal acquisition of knowledge and goal setting in managing the needs for everyday life, including regulating health behaviors. Specific to the study context, a previous study conducted by Kim et al. (2015) found that university students develop greater changes in their health behaviors when they have knowledge, self-efficacy and positive social outcome expectations by sharing updates or information through the social networking sites. This study hypothesized that the university students' capabilities to use technology is important for information sharing using social media platforms. As these students gather more technical ability and social media experiences, they became more confident to share their health behaviors and achieve the expected outcome (Kim et al., 2015).

Environmental factors. Environmental factors refer to the surrounding conditions that influence individuals' abilities and beliefs. From a social media perspective, the conditions are closely linked with information literacy actions, such as information seeking and assessment (Zhu, Yang, MacLeod, Yu, & Wu, 2019). According to Bandura (2009), individuals have the capability to comprehend their environment and regulate the environmental events they encounter in every aspect of their lives, including health. These environmental events might have emotional effects and motivating power for individuals and may determine how they will use this information in the future (Bandura, 2009). Today, people apply information to create and communicate more knowledge. Zhu et al. (2019) found that environmental influences in the form of family supports increased the level of information and communication technology usage among teenage students in China. Furthermore, empirical evidence from Frimming, Polsgrove, and Bower (2011) suggested that the university environment is an ideal setting for sharing health and fitness knowledge through social media because of increased students' knowledge and efficacy on health information and physical appearance.

Behavioral factors. According to Bandura (2004), individuals' interactions with the environment further enhance the impact of health promotion. Social supports received during the interaction process help to ensure long-term success, especially if the social support has beneficial effects that raise a person's cognition or belief in his or her efficacy to manage a healthy lifestyle. Individuals tend to reconsider these behavioral changes by reflecting on the feedback at the time of action or after the action have ended (Ploderer, Reitberger, Oinas-Kukkonen, & Gemert-Pijnen, 2014). In the context of social media application, some people with health-related issues resist seeking face-to-face help and prefer to use online information because it is readily accessible, convenient and offers more anonymity (Bandura, 2004).

The literature discussed so far indicates potential explanations regarding the relevance of social cognitive theory in changing health behavior. Specific to young people, the use of social media sites is beneficial for mediating their health behavior change because sharing information online is part of their lifestyle and they are more capable of using this form of digital communication. Thus, this study sought to explore social media usage in supporting health behavioral change among youth.

Methodology

In social media studies, a recent method for research is to use the social media monitoring approach where people's attitudes expressed in social networking sites are examined and analyzed. However, Branthwaite and Patterson (2011) argued that an in-depth qualitative research interview offers more advantages and benefits than the social media monitoring method. Thus, face-to-face interviews were utilized in this study to explore the nature of personal cognitive characteristics among youths who used social media to change health behavior. In the study, the research informants were undergraduate students from a Malaysian public university and the social media site examined was Instagram. A purposive sampling inclusion criterion was adopted to select the targeted research participants which included: (i) students aged 18 to 24 years old, (ii) were active Instagram users, and (iii) have used Instagram specifically for overweight and/or obesity related information. The rationale for the inclusion criteria was to examine the personal cognition or awareness towards health behavior change among young people which are more concerned with physical state, competent use of social media and high risk for unhealthy lifestyle (Radzi et al., 2019).

The Instagram was chosen as it has a greater user engagement with public health information (Guidry, Jin, Orr, Messner, & Meganck, 2017). Specific to the Malaysia context, about the time the study was being conducted in January 2019, the percentage of Instagram users aged 18 to 24 years old was 31.9%, which exceeded the percentage of Facebook users (24.4%). Interviews were conducted with the belief that in-depth, critical and valuable information on social cognitive characteristics embedded within the online or digital environment would be discovered. Guest, Bunce, and Johnson (2006) suggested that six interviews are sufficient to provide meaningful interpretations for high-level, overarching themes of qualitative data exploration. Therefore, this study conducted six interviews with students from a Malaysian public university. Relevant and rich information was expected from this group of Instagram users, who were considered to have appropriate experience in social media. These cases were valuable for investigation of a contemporary phenomenon within its real-life context (Yin, 2014) and specifically related to knowledge utilization studies (Yin,

1981), such as the use of information available in social media sites for changing health behavior.

All the interviews were conducted by the authors following the standard techniques and protocol for face-to-face individual interviews. An interview guide was prepared and tested prior to the study. A public invitation to participate in the research was posted on the authors' Instagram accounts, together with the research participation criteria. Interested participants were then contacted personally and briefed about the research. A final six participants took part in the study and became the research informants.

All the research informants used Instagram for health-related purposes. Hence, their credibility was considered highly validated and trusted. The interviews (average duration of 55 minutes) were in a semi-structured format. All were digitally voice-recorded with the participants' consent. To ensure trustworthiness of the data, the authors summarized what the participants said at the end of each interview and sought further comments from the participants. All the interviews were transcribed following a simple transcription convention. Then the data were analyzed using a thematic analysis technique for classifying the text data into themes. Repeated readings of the transcripts and the classified data led to categorization of the text data into relevant emerging themes. In this way, the themes were validated inductively through expressions and identifications of the meanings.

Findings

The main objective of this study was to explore the outcomes of social media application on changing health behavior. This study adapted the framework from the social cognitive theory, which has been used extensively in the public health field, as a guiding framework. Specifically, this study referred to a social cognitive model suggested by Chin and Mansori (2018). Based on the model, the findings showed that the people use personal cognition (such as that gained from health knowledge and self-efficacy) and environmental factor (such as support gained from family and friends) to motivate and maintain health behavior (Chin & Mansori, 2018). The findings are reported under three main themes: 1) personal factors, 2) environmental events, and 3) behavioral actions. Selected quotations from interview respondents were also included.

Personal Factors

Based on social cognitive theory, personal factors are presented in the form of knowledge and attitudes that is illustrated by individuals' ability to overcome their self-belief and perform expected behaviors (Joseph, Ainsworth, Mathis, Hooker, & Keller, 2017). A person's cognition or awareness can be influenced by performance accomplishments, derivative experience, verbal persuasion and physiological states (Chin & Mansori, 2018). In the study, most of the research informants had a strong personal cognition that they were overweight or obese. This thought came from various factors, mainly from comments by others and obvious physical conditions. Most of the research informants received direct comments from other family members and friends about their overweight or obese appearance. The research informants were also aware of their physical states:

People (family and friends) said that I am fat. My family is like that, my sister is slightly overweight, and my father was big. I checked my body mass index (BMI) and it is 33. I aim to get my BMI below 26. (Informant 3, 21, male)

My family scolded me because I am fat and look big. I took a picture of me and saved it for later comparison (that is, after I slim down). (Informant 6, 22, female)

Other factors that also contributed to health behavior change are self-motivation and personal accomplishment. For example, one research informant aimed to lose weight and started exercising. She took pictures before and after she started the weight loss mission as a reminder not to get fat again. She cooked her own meals and measured her weight after every meal. She managed to lose weight and was happy when she reached her targeted body weight. On the other hand, other research informants felt upset and stressed by the comments they received from others, by a certain diet which was not working for them, traumatized by their saggy body shape or when their clothes no longer fit. All these feelings influenced the research informants' personal beliefs and compelled them to change their health behaviors.

All the research informants were aware that they had an unhealthy lifestyle. They knew about healthy eating behavior like taking up a good diet with the correct proportion of carbohydrates, proteins and vegetables, consuming less sugar and processed foods, and exercising regularly to control body weight. Because these research informants had prior knowledge about healthy practices, it was easier for them to change their unhealthy behavior by setting a primary goal to lose weight and changing their behaviors accordingly.

Environmental Factors

According to Chin and Mansori (2018), environmental factors consist of support from family and friends during the social interactions and health behavior change process, which could motivate individuals to act positively towards the expected outcomes. This study aimed to explore the environmental outcomes (either as a support or barrier) from the social interactions encountered via the Instagram. This particular social media site lies in a digital environment that provides networking places for online social interactions. In the study, all the research informants posted online regular messages and pictures related to their body weight management in the Instagram site. The information ranged from healthy food tips, including recipes, weight management plans and physical exercise activities, to motivational advice from fitness coaches. The main purposes for which the research informants posted on the social media sites were to seek feedback and to share health information with others:

I posted in Instagram on how much weight I lost. Friends noticed the change in my body appearance and asked how I did it. So, I posted almost daily recipes for healthy food and tips for losing weight. I posted because I wanted to share with others, to motivate others and at the same time as a reminder to myself. I posted my plan and put a hashtag at my body weight target to inform people and to help me achieve the target. (Informant 1, 23, male)

All the research informants were determined to reduce their body weight and adopted healthier behavior. The Instagram provided a platform for these research informants to gain feedback about their health behavior from family and friends within the digital social network. The feedback came through as direct messages in the respective Instagram sites. The feedback

formed social interactions between the research informants and their family members and friends and helped in developing new relationships with others such as fitness coaches and gathering more followers in Instagram. To show their support, people regularly asked for more healthy tips and pictures or updates from the research informants. The constant communication within Instagram created a socially interactive platform for changing health behavior among the research informants:

I follow fitness coaches and sent direct messages asking for (healthy) tips from them. A fitness coach gave me a diet plan and would track my activities and health progress. I also recommended friends to follow a fitness coach. And sometimes helped on behalf of my friends to ask (for certain information) from the fitness coach. (Informant 4, 21, female)

It is worth noting that some of the feedback became a social barrier to certain research informants, particularly negative comments from friends and family. For example, one research informant posted other pictures with health-related messages instead of her own personal pictures because she was afraid of what people might say about her attempt to lose weight. This is possibly because she had little confidence about her look. This indeed has demonstrated that social media affirmation had a positive effect on self-esteem and such an effect was partially mediated by actual and ideal-self congruence (Isaranon, 2019).

Health Behavior

Individuals who have personal cognition or awareness on health behavior perform various actions to achieve the expected outcomes (Chin & Mansori, 2018). In the study, the expected outcome was mainly about losing body weight that was gained through a health behavior changing process and was mediated using Instagram as a social media site. All the research informants sought further information on healthy eating or weight management from the Instagram as a mean to change or improve their personal cognition. One research informant had also used other forms of digital media like a fitness application installed in her phone and posted pictures of food she ate in the WhatsApp status as to gain more feedback and knowledge on health behavior. These behavioral changes were carried out specifically to gain more knowledge about losing weight and better management of the informants' body weight:

I did research (within the social media site). I learnt it is important to take care of our body and to study. I open Instagram to look for work-out and diet information. There are many fitness information shared by others in Instagram. (Informant 2, 21, female)

I studied diet information posted in Instagram, and I posted my overweight pictures in Instagram. I used the Internet to find BMI and fat calculations. (Informant 3, 21, male)

The behavioral changes of these research informants were also influenced by the people who responded directly to them either online or offline. For example, some fitness coaches and friends regularly provide support through direct messages in their Instagram. Some of the research informants had further carried out their social networking interactions outside of the digital networking site, such as face-to-face meeting with friends and discussing about their physical appearance and sharing their healthy practices with others through physical training. These actions intensified changes in health behaviors among the research informants and created further social interactions within and outside of the social media site:

Everyone is supportive, although some people give negative comments on my excessive physical activities. Friends (that I met on the Instagram) showed support and later joined me during the exercise. My aunt advised on my cycling attire (through direct message), and my grandmother taught me to prepare traditional salad. I met people with whom I shared information (or interacted) within Instagram, and I joined a fitness center together with the people that I knew from Instagram. (Informant 2, 21, female)

Research informants valued feedback from their family and friends in their attempt to achieve their health goals. In addition, social media sites provided peer information that family and friends may not provide, and this met the needs of young people in getting health information and support from online correspondence. This echoes the findings of Fergie et al. (2013) who suggested that young people value social recognition and peer-generated health information content to which they can relate.

Discussion

Based on the social cognitive model from Chin and Mansori (2018) and the findings presented in previous sections, all the research informants in this study had personal cognition and interacted with the environmental factors that led to changes in health behavior. To answer the first research objective, several emerging sub-themes were identified from these cases and complemented the social cognitive model as illustrated in Figure 1.

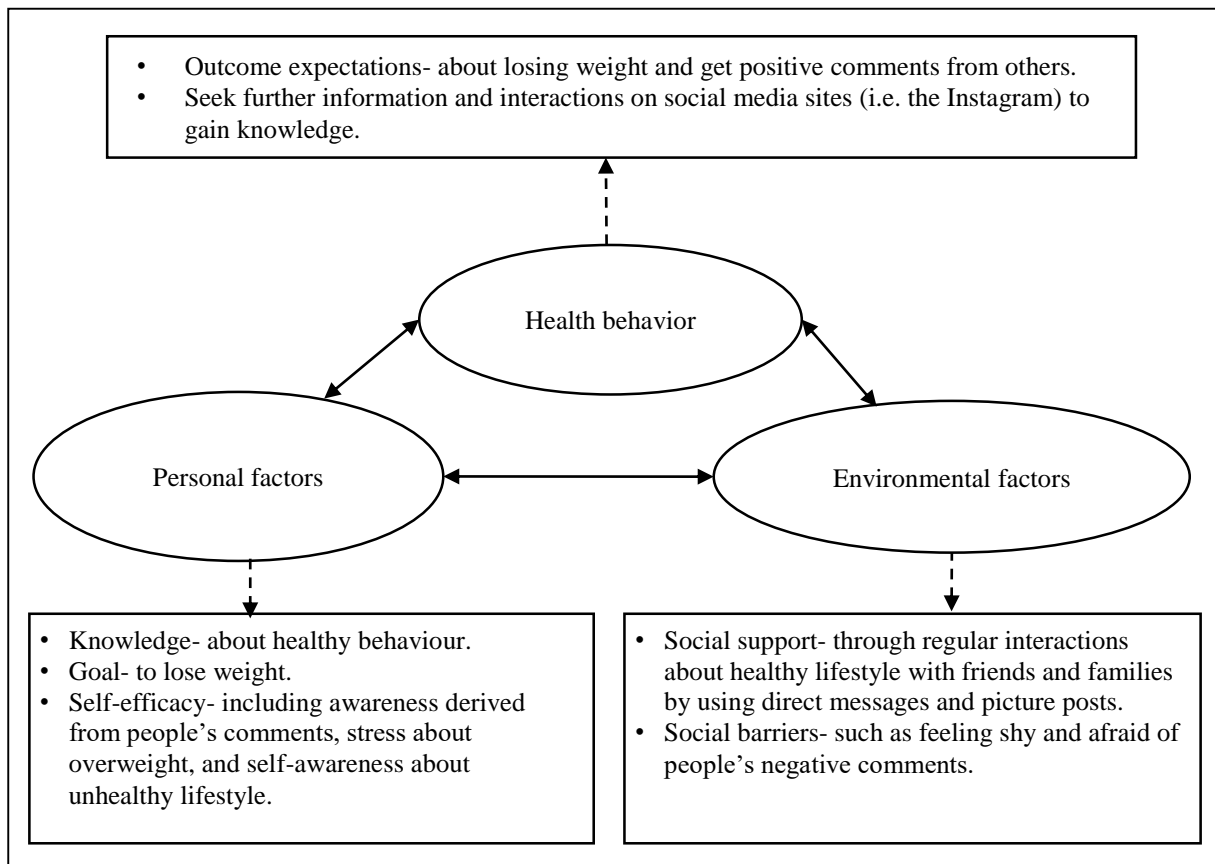


Figure 1. Social cognitive model for changing health behaviors among Instagram users. Source: Adapted from Chin and Mansori (2018) with the emergent sub-themes.

Figure 1 shows the social cognitive model for changing health behaviors among overweight Instagram users at a Malaysian public university. The solid double-headed arrows represent the bidirectional impact among personal factors in the form of cognitive thoughts (i.e. knowledge, goal, and self-efficacy), environmental factors in the form of social supports or barriers, and health behavior for the expected outcomes in changing or losing body weight. The dotted one-headed arrows represent the behavioral evidence of themes within the social cognitive model. This study indicates that social cognitive theory can explain individuals' interactions within the Instagram, a social media site for changing health behaviors particularly among young users at university. These findings are consistent with Kim et al. (2015) who reported that university students develop greater effects on their behaviors when they have knowledge and self-efficacy, positive social outcome expectations and shared enjoyment from the social networking sites.

To answer the second research objective, on how the factors contribute to the application of social media in relation to health behavior, themes synthesized from the study are illustrated in Figure 1, and further discussed. Social cognitive determinants (i.e. personal cognition or awareness) are clustered within people's networks and these determinants influence health behavior (Latkin & Knowlton, 2015). In the study, the personal cognition is that an unhealthy body weight is perceived as being big, fat or obese, and that is unacceptable, especially among the young groups of people who have high average of body weight or above certain acceptable body size limit. To be socially accepted, overweight individuals would like to change their health behaviors by getting health knowledge. Since the research participants were university students who are categorized as youths with the highest prevalence in using social media sites like Instagram, these participants were expected to search for information from this social networking platform first rather than meeting with professionals like a dietitian or fitness coach. The main benefits of using online social media for health promotion are the ease of access and readily available information (Latkin & Knowlton, 2015). The social interactions occur within social media generate environmental supports in the form of positive feedback that contribute towards a change in the cognition for health behavior.

Conclusion

The main findings of this study, based on the social cognitive theory, showed that getting feedback from the social interactions through the Instagram is effective in achieving the goal to lose weight among youths. All themes within the personal, environmental and behavioral components showed that interactions took place in a dynamic way, both online and offline. Based on the findings, it appears that the health behavior change was initiated in the real environment (not virtual) and all research informants had prior knowledge about healthy lifestyles that increased their personal cognition and awareness to lose weight. The role of Instagram in this study was mainly to facilitate the process for changing health behavior (Wilson et al., 2018) by providing a platform to search for health information and to engage in social interactions by seeking feedback and sharing knowledge. According to Wilson et al. (2018), more than 10% of posts on Instagram were food-related, and it was easy for individuals to access health-related information by using photo-sharing function. These explanations answer the main research question on how Instagram, a social media site affects social interaction for changing health behavior.

The rapid development and wide accessibility to social media sites allow all groups of people to participate in various lifestyle behaviors. One participative mechanism is that social media can facilitate social interaction and health behavior change. Young people use social media mostly through mobile devices, and they increasingly use social media for health-related interactions with others. In this paper, current evidence on social cognition was explored among Instagram users at a Malaysian public university in the context of health behavior change. In summary, the health behavior change in young Instagram users first initiated in offline environment, then organically moving between offline to online social media environment. All research informants have adequate healthy lifestyle knowledge that influences their motivation for effective weight loss. Instagram reinforces positive health behavior change by serving as a platform for discussion and disseminating information about weight loss.

From the social media perspective, Instagram primarily serves as a communication tool for social interactions and promoting business. Today, the promotional activity in Instagram goes beyond the commercial context and has public health benefits (i.e. health promotion). This paper proposes that Instagram plays a mediating role in changing health behavior among young users. The study does not suggest generalization of the health behavior to other groups of users or health conditions, as the findings are not sufficiently generalizable based only on the experiences of a small group of university students. Indeed, many other experiences of university students who have involved in health behavior change may not be represented in the data. Different viewpoints are also valuable, particularly from the young obese individuals who receive professional assistance.

Future studies might conduct more detailed investigations pertaining to personal, environmental and behavioral factors in relation to the use of a social media site for changing health behavior. Numerous interesting potential research avenues can be used to examine different health issues like clinical diseases, different social media sites like Facebook and different target groups. Also, future research should investigate the role of a social media site among youths from other theoretical viewpoints, for example, from the theory of planned behavior or technology acceptance perspectives.

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References

- Ahmad Sharoni, S. K., Abdul Rahman, H., Minhat, H. S., Shariff-Ghazali, S., & Azman Ong, M. H. (2018). The effects of self-efficacy enhancing program on foot self-care behaviour of older adults with diabetes: A randomised controlled trial in elderly care facility, Peninsular Malaysia. *PLOS ONE*, *13*(3), e0192417. doi:10.1371/journal.pone.0192417
- Bandura, A. (1998). Health promotion from the perspective of social cognitive theory. *Psychology & Health*, *13*(4), 623-649. doi:10.1080/08870449808407422

- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior, 31*(2), 143-164. doi:10.1177/1090198104263660
- Bandura, A. (2009). Social cognitive theory of mass communication. In *Media Effects: Advances in Theory and Research* (3rd ed., pp. 110-140). New York: Routledge.
- Branthwaite, A., & Patterson, S. (2011). The power of qualitative research in the era of social media. *Qualitative Market Research: An International Journal, 14*(4), 430-440. doi:10.1108/13522751111163245
- Cavusoglu, L., & Demirbag-Kaplan, M. (2017). Health commodified, health communified: navigating digital consumptionscapes of well-being. *European Journal of Marketing, 51*(11/12), 2054-2079. doi:10.1108/EJM-01-2017-0015
- Chin, J. H., & Mansori, S. (2018). Social marketing and public health: A literature review. *Journal of Marketing Management and Consumer Behavior, 2*(2), 48-66.
- Clark, J. L., Algoe, S. B., & Green, M. C. (2018). Social network sites and well-being: The role of social connection. *Current Directions in Psychological Science, 27*(1), 32-37. doi:10.1177/0963721417730833
- Dev, R. D. O., Kamalden, T. F. T., Geok, S. K., Abdullah, M. C., Ayub, A. F. M., & Ismail, I. A. (2018). Emotional intelligence, spiritual intelligence, self efficacy and health behaviors: Implications for quality health. *International Journal of Academic Research in Business and Social Sciences, 8*(7), 794-809. doi:10.6007/IJARBS/v8-i7/4420
- Dunlop, S., Freeman, B., & Jones, S. C. (2016). Marketing to youth in the digital age: The promotion of unhealthy products and health promoting behaviours on social media. *Media and Communication, 4*(3), 35-49. doi:10.17645/mac.v4i3.522
- Fergie, G., Hunt, K., & Hilton, S. (2013). What young people want from health-related online resources: A focus group study. *Journal of Youth Studies, 16*(5), 579-596. doi:10.1080/13676261.2012.744811
- Field, J. A., Elbert, D. J., & Moser, S. B. (2012). The use of social media in building interest in wellness on a college campus. *American Journal of Business Education, 5*(5), 515-524. doi:10.19030/ajbe.v5i5.7207
- Frimming, R. E., Polsgrove, M. J., & Bower, G. G. (2011). Evaluation of a health and fitness social media experience. *American Journal of Health Education, 42*(4), 222-227. doi:10.1080/19325037.2011.10599191
- Gardner, B. (2015). A review and analysis of the use of 'habit' in understanding, predicting and influencing health-related behaviour. *Health Psychology Review, 9*(3), 277-295. doi:10.1080/17437199.2013.876238
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods, 18*(1), 59-82. doi:10.1177/1525822X05279903
- Guidry, J. P., Jin, Y., Orr, C. A., Messner, M., & Meganck, S. (2017). Ebola on Instagram and Twitter: How health organizations address the health crisis in their social media engagement. *Public Relations Review, 43*(3), 477-486. doi:10.1016/j.pubrev.2017.04.009
- Instagram users in Malaysia. (2019, January). Retrieved from <https://napoleoncat.com/stats/instagram-users-in-malaysia/2019/01>
- Isaranon, Y. (2019). The role of Facebook affirmation towards ideal self-image and self-esteem. *The Journal of Behavioral Science, 14*(1), 46-62.
- Joseph, R. P., Ainsworth, B. E., Mathis, L., Hooker, S. P., & Keller, C. (2017). Utility of social cognitive theory in intervention design for promoting physical activity among African-American women: A qualitative study. *American Journal of Health Behavior, 41*(5), 518-533. doi:10.5993/AJHB.41.5.1

- Kamel Boulos, M., Giustini, D., & Wheeler, S. (2016). Instagram and WhatsApp in health and healthcare: An overview. *Future Internet*, 8(3), 37. doi:10.3390/fi8030037
- Kelly, M. P., & Barker, M. (2016). Why is changing health-related behaviour so difficult? *Public Health*, 136, 109-116. doi: 10.1016/j.puhe.2016.03.030
- Kim, J., Lee, C., & Elias, T. (2015). Factors affecting information sharing in social networking sites amongst university students: Application of the knowledge-sharing model to social networking sites. *Online Information Review*, 39(3), 290-309. doi:10.1108/OIR-01-2015-0022
- Latkin, C. A., & Knowlton, A. R. (2015). Social network assessments and interventions for health behavior change: A critical review. *Behavioral Medicine*, 41(3), 90-97. doi.org/10.1080/08964289.2015.1034645
- Lin, H. C., & Chang, C. M. (2018). What motivates health information exchange in social media? The roles of the social cognitive theory and perceived interactivity. *Information & Management*, 55(6), 771-780. doi:10.1016/j.im.2018.03.006
- World Health Organization. (2019, April). Malaysia and WHO call for more investment in primary health care the 21st century. Retrieved from <https://www.who.int/malaysia/news/detail/08-04-2019-malaysia-and-who-call-for-more-investment-in-primary-health-care-the-21st-century>.
- MCMC, (2018). *Internet users survey 2018*. Cyberjaya, Malaysia: The Malaysian Communications and Multimedia Commission.
- Peltzer, K., Pengpid, S., Samuels, T., Özcan, N., Mantilla, C., Rahamefy, O., . . . Gasparishvili, A. (2014). Prevalence of overweight/obesity and its associated factors among university students from 22 countries. *International Journal of Environmental Research Public Health*, 11(7), 7425-7441. doi:10.3390/ijerph110707425
- Ploderer, B., Reitberger, W., Oinas-Kukkonen, H., & Gemert-Pijnen, J. (2014). Social interaction and reflection for behaviour change. *Personal Ubiquitous Computing*, 18(7), 1667-1676. doi:10.1007/s00779-014-0779-y
- Radzi, W. M., Jasimah, C. W., Salarzadeh Jenatabadi, H., Alanzi, A. R., Mokhtar, M. I., Mamat, M. Z., & Abdullah, N. A. (2019). Analysis of obesity among Malaysian university students: A combination study with the application of Bayesian structural equation modelling and Pearson correlation. *International Journal of Environmental Research and Public Health*, 16(3), 492-508. doi:10.3390/ijerph16030492
- Riley, L., Guthold, R., Cowan, M., Savin, S., Bhatti, L., Armstrong, T., & Bonita, R. (2016). The World Health Organization STEPwise approach to noncommunicable disease risk-factor surveillance: Methods, challenges, and opportunities. *American Journal of Public Health*, 106(1), 74-78. doi:10.2105/AJPH.2015.302962
- Santarossa, S., & Woodruff, S. J. (2018). # LancerHealth: Using Twitter and Instagram as a tool in a campus wide health promotion initiative. *Journal of Public Health Research*, 7(1), 9-13. doi:10.4081/jphr.2018.1166
- Sarkar, U., Le, G. M., Lyles, C. R., Ramo, D., Linos, E., & Bibbins-Domingo, K. (2018). Using social media to target cancer prevention in young adults. *Journal of Medical Internet Research*, 20(6), e203. doi:10.2196/jmir.8882
- Shukri, M., Jones, F., & Conner, M. (2016). Work factors, work–family conflict, the theory of planned behaviour and healthy intentions: A cross-cultural study. *Stress Health*, 32(5), 559-568. doi:10.1002/smi.2662
- Soheylizad, M., & Moeini, B. (2019). Social media: An opportunity for developing countries to change healthy behaviors. *Health Education Health Promotion*, 7(2), 57-58. doi:10.29252/HEHP.7.2.57

- Sunitha, S., & Gururaj, G. (2014). Health behaviours & problems among young people in India: Cause for concern & call for action. *The Indian Journal of Medical Research*, 140(2), 185-208.
- Wang, Y., & Willis, E. (2018). Supporting self-efficacy through interactive discussion in online communities of weight loss. *Journal of Health Psychology*, 23(10), 1309-1320. doi:10.1177/1359105316653264
- Wilson, B., Knobloch-Westerwick, S., & Robinson, M. J. (2018). Picture yourself healthy: How users select mediated images to shape health intentions and behaviors. *Health Communication*, 34(8), 838-847. doi:10.1080/10410236.2018.1437527
- Yang, Q. (2017). Are social networking sites making health behavior change interventions more effective? A meta-analytic review. *Journal of Health Communication*, 22(3), 223-233. doi:10.1080/10810730.2016.1271065
- Yin, R. K. (1981). The case study as a serious research strategy. *Knowledge*, 3(1), 97-114. doi:10.1177/107554708100300106
- Yin, R. K. (2014). *Case study research and applications: Design and methods*. Thousand Oaks: Sage publications.
- Zhang, J., Le, G., Larochele, D., Pasick, R., Sawaya, G. F., Sarkar, U., & Centola, D. (2019). Facts or stories? How to use social media for cervical cancer prevention: A multi-method study of the effects of sender type and content type on increased message sharing. *Preventive Medicine*, 126, 105751. doi: 10.1016/j.ypmed.2019.105751
- Zhu, S., Yang, H. H., MacLeod, J., Yu, L., & Wu, D. (2019). Investigating teenage students' information literacy in China: A social cognitive theory perspective. *The Asia-Pacific Education Researcher*, 28(3), 251-263. doi:10.1007/s40299-019-00433-9