Influence Factors for Intention to using Facebook to Mitigate Obesity among Sudanese Women

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Abstract:

Social media (SM) has rapidly evolved over the years to become a dominant platform used globally by millions of users for a variety of applications. In contrast, health problems, in particular, obesity have worsened over recent years. The literature review undertaken in this study has revealed that obesity remains one of the significant health issues globally. Also, despite the widespread use of SM among the population in developing countries, such as Sudan, the use of technology interventions to mitigate adverse health habits remains in its infancy. Likewise, there are limited theoretical models which lead towards the intention to use SM such as Facebook to address these sorts of problems. Therefore, this study proposes a model for the intention to use Facebook as the most popular platform in Sudan to mitigate the problem of obesity with particular emphasis on investigating the important factors that lead to the intention to use Facebook for dieting among middle-aged Sudanese women. In this study, a framework model was developed by hybridising the Theory of Planned Behaviour (TPB) and the Health Beliefs Model (HBM) which included factors that could predict preventive health behaviours from the HBM, namely; perceived susceptibility, perceived seriousness, and perceived threat. This also included the factors related to the TPB such as attitude, perceived behavioural control and subjective norms. This research study is a progress paper that contributes to the body of knowledge in this domain, in particular, obesity. While the framework model has not been tested, it is proposed that future research is undertaken to empirically investigate the proposed model by using smart PLS3 for further analysis.

Keywords:

Obesity, diet, Facebook, Health believe Model, Theory of Planned behaviour.

1. Introduction

The prevalence of obesity as standard fat accumulation (WHO 2006) has been increasing over the past five decades (Sturm & Hattori, 2013). The statistics regarding the number of obese and overweight people in the world is rapidly growing, and becoming one of the leading causes of morbidity and mortality (Ligibel et al., 2014). Several medical researchers have shown that individuals who are obese have a much higher risk of developing obesity-related diseases, such as coronary heart disease, type 2 diabetes, cancer, hypertension, stroke, liver and gallbladder diseases (Ajie & Chapman-Novakofski, 2014). Also, obese individuals often face psychological threats from society becoming hugely stigmatised and are often thought to be "lazy, unmotivated, lacking in self-discipline, less competent (Hunger & Major, 2015; Schmalz & Colistra, 2016; Spahlholz, Baer, König, Riedel-Heller, & Luck-Sikorski, 2016). In the workplace scenario, healthcare expenses relating to obese individuals are much higher compared to other employees given their chronic conditions which require the frequent utilisation of health care services (Ahmadi, Rezaiee, & Hashemian, 2014; Flaherty, 2014). While the obesity phenomena has fast become a major public health threat, it has also been observed that the use of social media (SM) has fast become a powerful and dominant communication tool of the 21st century (Yakasai & Jusoh, 2015).
Scientific research directed towards the benefits and competitive advantages of using SM in the health domain has generally been undertaken using a theoretical model (Dahl, Hales, & Turner-McGrievy, 2016; Gruver et al., 2016). While, other studies have instead pursued a descriptive approach or by performing content analysis (Harris, Moreland-Russell, Tabak, Ruhr, & Maier, 2014). However, most of this research has been limited towards focussing

on developed and industrials countries, although the availability and affordability of social media in developing countries has not been investigated in the context of the in the health sector.

The Sudanese population is a hybrid between the Arab and African races constituting numerous cultures, customs and traditions. Some of these customs and traditions have unfortunately contributed significantly to the increasing rates of obesity in women particularly around the childbearing age (Stevens et al., 2012). It is also worth mentioning that the obesity problem requires multi-sector replies in order to create a more encouraging and motivating social and physical environment to reduce this problem (Bemelmans, Wijnhoven, Verschuuren, & Breda, 2014). SM enables the collaboration, communication, empowerment, engagement, and the ability to educate consumers and health care providers (Boero, 2013). Furthermore, SM can create and present specific content addressing healthy lifestyles regarding diet (Gollust, Eboh, & Barry, 2012).

Furthermore, SM provides the means to assist in research given it is inexpensive as a tool to scale up for more comprehensive forms of implementation and to facilitate data collection (Korda & Itani, 2013; McGowan et al., 2012). In more recent years, SM has provided the Sudanese community with greater access to health-related information from a variety of online SM sources. One such SM platform is Facebook, which is widely used in Sudan. Interestingly, some sites using Facebook in Sudan are helping to address the problem of obesity such as "Dieting with Fatien" and "Health and Beauty". This study reviews the existing literature on obesity in three sections. First, by investigating the negative impact of obesity; secondly, by exploring the influence of SM and the context of health behavioural changes; and lastly, by adopting a theoretical perspective.

Obesity is defined as a body-mass index (BMI). There is no doubt that obesity can lead towards increasing the cost of accessing medical services (such as medical drugs for weight loss, bariatric surgery, and diet therapy) (Hui et al., 2017). Medical researchers have revealed that most obese individuals face a more significant hazard of developing obesity-related diseases, such as heart disease, diabetes, cancer, hypertension, liver, and gallbladder. Likewise, obesity may also be a result or an expression of psychological threats from society (Landsberg et al., 2013). While obese individuals are extremely stigmatised due to their weight and suffer from severe social discrimination as mentioned earlier, they likewise suffer from weight bias in education, employment, and in the medical sector (Ng et al., 2014).

Short and long-term morbidities of teenage obese are frequently encountered. Teenage obesity is associated with an increased rate of school absenteeism and a reduced quality of life (Ajie & Chapman-Novakofski, 2014). In developing countries as well as countries having a low Human Growth Index (HDI), female obesity in all age has reached an alarming level (Yang & Huffman, 2013). There is also a much higher indication in that globalisation plays a vital role in contributing towards overweight and obesity, given changes in job types, stress and sociocultural factors which usually affect physical activity. In fact, these factors relate to an increase in the rate of obesity in women compared to their male counterparts in those countries (Popkin, Adair, & Ng, 2012). These factors have mainly driven by economic growth, daily diets and lifestyle changes in developing countries. With women, obesity poses serious risks to their reproductive health and the health of the foetus and sedentary behaviours. All of these factors lead to an escalation in the obesity of women, making them more vulnerable to serious risks (Bobrow, Quigley, Green, Reeves, & Beral, 2013) such as gestational diabetes mellitus (GDM), preeclampsia, congenital malformations and foetal growth abnormalities [38]. In fact, maternal obesity is associated with higher susceptibility to lifelong risks regarding diabetes mellitus and cardiovascular disease for the woman and an increased risk of childhood obesity (Ahsan et al., 2013).

Many developing countries are affected by the high numbers and rates of overweight individuals. Recent reports indicate that the prevalence of overweight-obesity in the reproductive age of women has grown steadily during the last few decades (Ng et al., 2014). As Sudan is the second largest African country with a population more than 40 million and with various cultural and social backgrounds this has also led towards an increase in the level of obesity found in women. In some developing counters, the level of educational is associated with a higher prevalence of overweight or obese individuals. Recently, Sudan has transitioned from manual labour to more sedentary occupations resulting in the decline of physical activity, and consequently, sedentary lifestyles are becoming more common. This is particularly common in urban/rural areas and in the cultural interactions, customs and traditions which play a major role in increasing obesity rates, particularly among women of marriageable age (Dennedy & Dunne, 2010; Elfaki).

Notwithstanding, obesity can also lead to poor pregnancy among Sudanese women and has been considered as one of the main threats to maternal health in Sudan (Alhaj, Radi, & Adam, 2010). Similarly, behavioural, economic and sociocultural factors are also responsible for the dramatic increase in obesity, for instance, the availability, cost, taste and energy density of food, portion size, and snacking, greater use of automobiles, energy-saving appliances, televisions and computers. Moreover, the transformation witnessed in Sudan throughout the last decade towards a more sedentary lifestyle has contributed significantly to the spread of obesity (Nagwa, Elhussein, Azza, &

Abdulhadi, 2011). Furthermore, the cultural perception of weight and body image in Sudanese society may be viewed in a different setting which could be perceived as a sign of prosperity as opposed to the stigma that exists in some developed societies (Prentice, 2006). Therefore, comprehensive obesity prevention programs to promote healthy food habits and physical activity, especially in women, need to be introduced.

The term SM, can be defined as a set of online applications for the creative exchange of user-generated content [45]. It can also be defined as a set of Internet-grounded applications that lead to the creation and exchange of user-generated content (Leonardi, Huysman, & Steinfield, 2013). SM provides an added or new dimension to health care given it proposes a mediator to be employed by the community, patients, and health experts to interconnect concerning health-related matters to possibly refine health-related outcomes (Moorhead et al., 2013). The application of SM is transforming how people access, create and use information and services.

Nowadays, there is a universal trend towards the use of SM to obtain information regarding health related issues using platforms such as 'Twitter' and 'Facebook' (Bickmore, Utami, Matsuyama, & Paasche-Orlow, 2016) in delivering cost-effective methods to intensify user communication, to offer peer-to-peer support and broaden the admission to health involvements. However, despite the growing research on the use of SM platforms to address health problems, according to the proposed theoretical framework, there are limited studies on the use of SM based on a practical, if not an applicable framework to address these problems. Rather, many studies have instead tended to adopt a descriptive approach towards the problem (Zahn et al., 2014). As such, obesity and overweight issues have now become a global health problem.

In Sudan, the telecommunications sector has become the fastest growing sector over recent years. This fact is supported by a recent report issued by the Global System for Mobile Communications Association GSMA (2015), stating that by the end of 2014, Sudan would have about 27.6 million mobile connections representing 70% of SIM penetrations among 39.2 million people, with 97% of these mobile connections being mobile phone prepaid internet user accounts. This figure did not include, the 10.4 million users accessing online services via personal computers (Mutong'Wa, Campus, Khaemba, & Mengich, 2014). The report also identified that SM in Sudan among the younger population was considered beneficial, in helping to solve many of the problems experienced by this group of people. On the other hand, Facebook has a significant advantage in that it is a real-time social networking platform that allows people to stay updated with the latest news and other information. Facebook also allows users to share and post their opinions, ask questions which makes the platform attractive in addressing problems related to health behaviour (Grgic & Mucnjak, 2017).

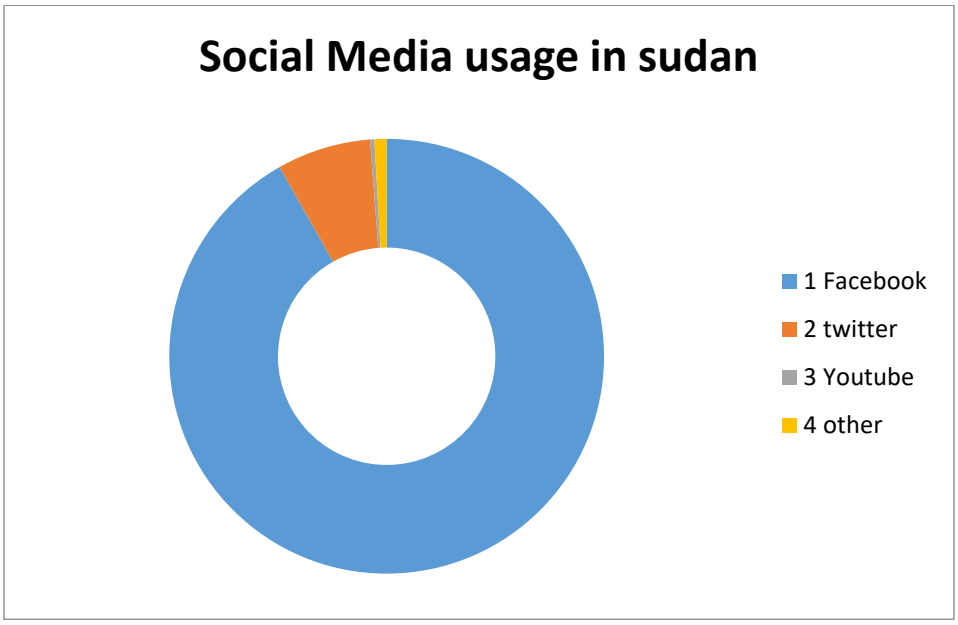

Fig.1. Most visited social media in Sudan, 2015 Sources: (National Telecommunication Corporation Sudan)

2. Theoretical perspective

Information system (IS) theories are fundamental in identifying the determinants of intervention factors (Sezgin & Yıldırım, 2016) and has a significant role in framing and creating scientific research [28]. IS theories help to examine all factors that affect the success of the intervention of SM and to ensure continuity in the use of technology (Galliers & Leidner, 2014). However, limited studies regarding the use of SM platforms to address critical health issues such as obesity remains (Yoo, Jeong, & Park, 2010).
Therefore, the objective of this study is to explore the factors which have lead towards the behavioural intention among young Sudanese women to use Facebook in helping to address the problem of obesity and diet, using a model based on a combination of HBM and TPB. By adopting a healthy diet, given the exposure to serious risk factors mentioned earlier, is considered to be one of the most effective ways to help control and lose weight and combating obesity (Foright et al., 2018; McCuen-Wurst, Ruggieri, & Allison, 2018). Diet is also considered to be one of the most suitable activities given the weather conditions in Sudan. Sudan is a tropical country, which makes activities such as exercise difficult and often inconsistent. Likewise, the conservative Sudanese customs and traditions also make other activities like exercising undesirable for women to partake in (Badri, 2018)].

2.1 Theory of Planned Behaviour (TPB) and the Health Belief Model (HBM)

The Theory of Planned Behaviour (TPB) began as the Theory of Reasoned Action (TRA) in 1980 to predict an individual's intention to engage in behaviour at a given moment and place (Beck & Ajzen, 1991). TPB has been used positively to forecast and clarify a broad range of health behaviours and is considered one of the most widely used models for health behaviour and interventions, such as smoking, drinking, health services utilisation, breastfeeding, and substance use (Karimy, Niknami, Heidarnia, Hajizadeh, & Montazeri, 2013; Webb, Joseph, Yardley, & Michie, 2010). TPB states that behavioural achievement depends on both the motivation (intention) and capability (behavioural control) and discriminates between three types of beliefs: behavioural, normative, and control (Alzahrani, Mahmud, Ramayah, Alfarraj, & Alalwan, 2017) Furthermore, TPB predicts an individual's intention to use IS and helps to provide more precise information in order to better guide development. TPB has been effectively used to forecast a comprehensive range of health and non-health related behaviours (Corace et al., 2016). It was initially developed to describe behavioural intentions associated with information technology (IT) (Asadi & Saedi, 2016) in that subjective norms determine a person's intentions, attitude, perceived behavioural control and that behaviour is, in turn, determined by intentions and perceived behavioural control.
HBM was initially developed as a systematic way to explain health behavioural practices. Recently, HBM was revised to include overall health motivation for the determination of different illness behaviours (Hochbaum, Rosenstock, & Kegels, 1952). Further, HBM is viewed as the start of systematic theory-based investigation into health behaviour. In this sense, HBM is purposeful to study all sorts of health behaviour. Health behaviours are grouped into three categories; individual perceptions, adopting behaviours, and the probability of action. Individual perceptions are features that affect the perception of sickness and they contract with the meaning of health to the individual, perceived susceptibility, and perceived severity, thereby adapting issues containing demographic variables, perceived threat, and cues to action (Green & Murphy, 2014).
On the other hand, TPB states that subjective norms determine the intentions, attitudes, perceived behavioural control and behaviour which in turn is determined by intentions and perceived behavioural control (Ajzen, 2011). There is considerable overlap between the two theories which highlights the importance of proximal versus distal predictors of health behaviour. Individual perceptions are features that affect the perception of sickness; they contract with the meaning of health to the individual, perceived susceptibility, and perceived severity. Adapting issues contain demographic variables, perceived threat, and cues to action (Green & Murphy, 2014).. Both HBM and TPB share several common features as they both adopt an individual level approach in predicting health behaviour and are both based on an expectancy-value (Krawczyk et al., 2012). Several studies, such as (de Visser, Waites, Parikh, & Lawrie, 2011; Gerend & Shepherd, 2012; Riley, Cesar, & Rivera, 2014; Yoo et al., 2010), have combined HBM and TPB.

2.2 Research model and hypothesis development

Several researchers have highlighted the importance of the SM platform in the context of obesity (Chang, Chopra, Zhang, & Woolford, 2013; Li, Barnett, Goodman, Wasserman, & Kemper, 2013) Most of the previous studies are mainly descriptive and qualitative in their approach and lack a theoretical framework to determine the important concepts. Therefore, building on prior literature, a conceptual model was developed in this study (refer to Figure 2)

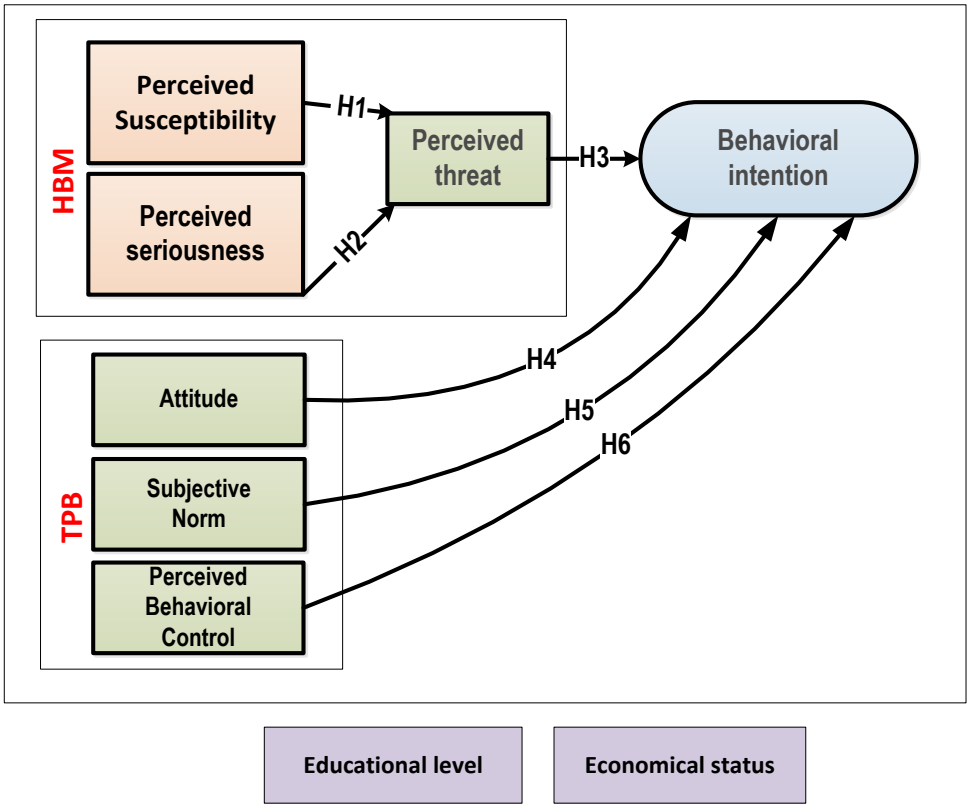

Fig.2 Conceptual model for intention to use FB for diet

by hybridising two theories; the TPB and HBM. The research model addresses the interrelationships between the variables considered necessary for the study. The development of such a framework must allow for hypothesising, testing of certain relationships and whether the theory framed is legal or not (Sekaran & Bougie, 2010). Furthermore, the research model should explain the relationship between constructs. Accordingly, composite or full structural models are produced when the measurement model and the structural models are combined (Figure 2).

2.3 Hypotheses

According to (Kim, Ahn, & No, 2012) susceptibility refers to the subjective assessment of the risk in developing a health problem. The HBM predicts that individuals who perceive they are susceptible to a particular health problem will engage in behaviours in order to reduce the risk of developing that particular health problem (Kim et al., 2012). The subjective risks of contracting the condition argue that the perceived susceptibility towards impacting the effectiveness of the fear appeals may in-turn moderate or mediate the relationship between health worries and health behaviour. On the other hand, perceived threat is the belief that an individual is susceptible to a serious health problem, illness or disorder (Liang & Xue, 2010). Accordingly, to the above definition, in this research perceived susceptibility of obesity is deemed significant to the perceived threat of individuals regarding obesity.

H 1: Perceived Susceptibility by the mediating role of perceived threat will positively influence the behavioural intention to use Facebook for dieting.

Perceived susceptibility, refers to one's perception of the risk or the chances of contracting a health disease or condition it also can include estimates of re susceptibility and susceptibility to illness in general (Updegraff, Brick, Emanuel, Mintzer, & Sherman, 2015).That people will take action to prevent or control illness if they believe that they are susceptible to that illness, especially if they view the illness as potentially having serious consequences to

them, they believe that by following a recommended health action they would reduce their susceptibility to or the severity of the illness(Joseph, Burke, Tuason, Barker, & Pasick, 2009).

H 2: Perceived seriousness by the mediating role of perceived threat will positively influence the behavioural intention to use Facebook for dieting among young Sudanese women.

Researchers defined perceived seriousness as an individual's belief about the severity of the disease (Smith et al., 2011). Perceived seriousness mentions the grade that a person thinks regarding a specific sickness or a condition that is serious (Gibbons, Thorsteinsson, & Loi, 2015)

H 3: Perceived threat will positively influence the behavioural intention to use Facebook for dieting among young Sudanese women.

Perceived threat defined as the personal conviction that a threatening health problem is serious and has potentially negative consequences for lifestyle(Goldzweig, Hasson-Ohayon, Alon, & Shalit, 2016).

The study proved that perceived threat is a significant variable used to predict behavioural intention (Golden & Earp, 2012). In this current study, the perceived threat of obesity is significant to the intention of obesity behaviour.

H 4: Attitude towards Facebook will positively influence the use of Facebook for dieting among young Sudanese women.

Attitude means the way in which a person thinks and feels about someone, or something (Wertz, 2012). There is a significant relationship between attitude and the intention towards technology (Prati, Pietrantoni, & Zani, 2012).

H 5: Subjective norms will positively influence the behavioural intention to use Facebook for dieting among young Sudanese women.

An individual's perception of particular behaviours which is influenced by the judgment of significant others (Walsh, Hamilton, White, & Hyde, 2015; Wong & Lee, 2016); which are recognised as subjective norms. Several researchers confirmed that subjective norms would positively influence the use of technology (Sánchez-Prieto, Olmos-Migueláñez, & García-Peñalvo, 2016).

H 6: Perceived behavioural control will positively influence the intention the use Facebook for dieting among young Sudanese women.

Perceived behavioural control is distinct as an individual's perceptions of how easy or difficult it is to perform a specific behaviour. Behavioural control has been shown to have an outcome on the main dependent variables such as intention and behaviour in a variety of areas and that perceived behavioural control directly influences the intention (Bhatti, 2015). This study suggests that perceived behavioural control will positively influence the intention to use a Facebook Facebook for dieting among young Sudanese women.

2.4 Moderating effects.

When needing to apply technology to enact health changes there are several theoretical variables that play a moderating role in terms of the impact of other predicted variables (Cheung & Vogel, 2013), These moderating variables are mostly used to test the moderating effect regarding the strength or weakness of a relationship between an independent and dependent variable (Dawson, 2014). Previous studies highlighted the importance of moderating variables such as gender, age, economic status and educational level. The outcome of these studies has indicated that the level of education and economic status is highly significant towards behavioural intention (Jafarkarimi, Saadatdoost, Sim, & Hee, 2016). Present researchers suggest that the use of Facebook for selecting diets among middle-aged Sudanese women should be based on their educational level and economic status as the control variables. Hence, the scope of this study was aimed at a particular target group; young Sudanese women which centred on the female group.

3. Future Research and Limitations

There are several limitations inherent in this study. Firstly, no data were collected. Secondly, the proposed theoretical model in this paper was not tested with empirical data. Thirdly, the limited scope of the literature review, given it only focused on the young Sudanese women, and ignoring other age groups who intend to use Facebook in order to change their mind-set regarding obesity. The scope of the literature review was focused on the Facebook user in order to change their mind-set regarding obesity and the use of the SM platform in the health domain in developing countries in general, particularly in Sudan. Therefore, the results cannot be generalised to compare or apply to other countries. Despite the above limitations, this study provides a significant contribution to the health information research field and opens up several opportunities to extend the knowledge in this domain and for future study.

4. Conclusions

The use of SM to mitigate the issues surrounding obesity in Sudan is extremely important; in particular among young Sudanese women given the significant health risks arising due to the level of obesity among young women. This constitutes a significant challenge for health economics by increasing the cost of obesity-related disease and reproductive health costs. This paper provides a significant contribution to the theory and practices towards the use and application of using the SM via Facebook to address obesity and dieting among young Sudanese women. This study has numerous empirical and theoretical contributions. First, this is the first work which has applied the individual factors that affect young Sudanese women towards the intention to use SM to address passive health behaviour and obesity. Second, this study offers a research model that can be leveraged for future research studies. The research model assists in closing the theoretical gaps regarding development through the use of SM in order to change health behaviours.

Further, it is envisaged that the outcomes of this study can be used as a guideline for healthcare providers regarding SM platforms that may contain adverse health information in order to create successful interventions with minimum cost. The researcher of this study aimed to discover the primary concepts, constructs, and set of initial factors influencing the use of SM towards individual behavioural intentions. Consequently, the TPB and HBM model were founded upon the initial integrated theoretical model for the intention to use Facebook and its application with regards to dieting for young Sudanese women. Given the initial research, the model remains untested. Therefore, future work should be conducted which will require data to be collected in order to test the reliability and validity of the proposed model.

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