

BEHAVIOURAL INTENTION MODEL OF FACEBOOK USAGE FOR
WEIGHT LOSS AMONG YOUNG WOMEN IN SUDAN

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ABSTRACT

Obesity among young Sudanese women has a negative influence on the healthcare system as it raises the expense of medical care and increases the risk of maternal and reproductive health issues. Prior studies on the use of technology to overcome obesity focused mostly on the technological perspective and ignored the health beliefs factors. This study aims to propose and validate the behavioural intention model for using Facebook (FB) for weight loss among young women in Sudan by integrating the Health Belief Model (HBM) and the Theory of Planned Behaviour (TPB) (C-HBM-TPB). A quantitative research approach was adopted, specifically the survey method. Using purposive sampling, 250 respondents entailing young women who attend fitness and gym centres in Khartoum state (Sudan) were selected. Data analysis was performed using SmartPLS Version 3 based on Structural Equation Modelling (SEM). The empirical results revealed that significant factors that influence behavioural intention to use FB for weight loss among the young women in Sudan were as follows: Perceived Susceptibility, Perceived Severity, Perceived Threat, Attitude, Subjective Norm, and Perceived Behavioural Control. In addition, the findings showed that perceived threat had a positive mediation role in the link between perceived susceptibility, perceived severity, and behavioural intention to use FB for weight reduction among young Sudanese women. In this context, the Level of Income was also explored as a moderator variable in the link between Attitude, Subjective Norm, Perceived Behavioural Control, and Behavioural Intention. The findings show that the Level of Income has a positive moderator influence on the association between Attitude and Perceived Behavioural Control and Behavioural Intention. However it has no moderator role in the relationship between Subjective Norm and Behavioural Intention. This study adds to the body of knowledge, particularly in the information systems (IS) domain, by presenting a comprehensive and integrated model capable of explaining 74% of the variance. In addition, according to the results of the Importance-Performance Matrix Analysis (IPMA), Perceived Susceptibility is the most important factor influencing the Behavioural Intention to use FB for weight loss, followed by Perceived Severity, Perceived Threat and Subjective Norm. The integrated C-HBM-TPB model can assist creators of FB groups for weight loss in identifying the most important elements impacting the use of FB for weight loss.

ABSTRAK

Masalah obesiti di kalangan wanita muda di Sudan memberi impak negatif ke atas sistem penjagaan kesihatan kerana ia meningkatkan perbelanjaan rawatan perubatan serta risiko isu-isu kesihatan ibu dan reproduktif di negara tersebut. Kajian-kajian lalu mengenai penggunaan teknologi bagi mengatasi masalah obesiti lebih tertumpu kepada perspektif teknologi, dan mengabaikan faktor-faktor kepercayaan kesihatan. Kajian ini bertujuan mencadangkan dan mengesahkan satu model niat tingkah laku untuk menggunakan Facebook (FB) bagi tujuan mengurangkan berat badan di kalangan wanitawanitamuda di Sudan menerusi gabungan Health Belief Model (HBM) dan Theory of Planned Behavior (TPB) (C-HBM-TPB). Pendekatan kajian kuantitatif digunakan, khususnya kaedah tinjauan. Dengan menggunakan persampelan bertujuan, 250 responden yang terdiri daripada wanita-wanita muda yang berdaftar di pusat-pusat kecergasan dan gim di Khartoum (Sudan) dipilih. Analisis data dijalankan menggunakan SmartPLS Versi 3 berasaskan Structural Equation Modelling (SEM). Hasil dapatan empirikal menunjukkan bahawa beberapa faktor penting mempengaruhi niat tingkah laku untuk menggunakan FB bagi tujuan mengurangkan berat badan di kalangan wanita-wanita muda di Sudan iaitu Persepsi Kerentanan, Persepsi Tahap Keterukan, Persepsi Ancaman, Sikap, Norma Subjektif, dan Persepsi Kawalan Tingkah Laku. Persepsi Ancaman didapati mempunyai kesan mediasi positif ke atas hubungan di antara Persepsi Kerentanan, Persepsi Tahap Keterukan, dan Niat Tingkah Laku. Kesan moderator Tahap Pendapatan juga dikaji bagi hubungan di antara Sikap, Norma Subjektif, Persepsi Kawalan Tingkah Laku, dan Niat Tingkah Laku dalam konteks yang sama. Hasil keputusan menunjukkan bahawa Tahap Pendapatan mempunyai kesan moderasi yang positif ke atas hubungan di antara Sikap dan Persepsi Kawalan Tingkah Laku dengan Niat Tingkah Laku, tetapi tidak mempunyai kesan moderasi ke atas hubungan di antara Norma Subjektif dan Niat Tingkah Laku. Kajian ini juga memperkayakan badan ilmu khususnya dalam bidang Sistem Maklumat (IS), menerusi penciptaan satu model komprehensif dan bersepadu yang mampu menjelaskan 74% daripada varians. Berdasarkan keputusan Importance-Performance Matrix Analysis (IPMA), Persepsi Kerentanan merupakan faktor terpenting mempengaruhi Niat Tingkah Laku untuk menggunakan FB bagi tujuan mengurangkan berat badan, diikuti oleh Persepsi Tahap Keterukan, Persepsi Ancaman dan Norma Subjektif. Model bersepadu C-HBM-TPB ini boleh membantu pentadbir kumpulan-kumpulan FB berkaitan penurunan berat badan mengenal pasti elemen-elemen terpenting mempengaruhi penggunaan FB untuk tujuan ini.

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LIST OF ABBREVIATIONS

ACP	-	Average Congruency Percentage
ATT	-	Attitude
AVE	-	Average Variance Extracted
BI	-	Behaviour Intention
CFA	-	Confirmatory Factor Analysis
C-HBM-TPB	-	Combined –HBM -TPB
FB	-	Facebook
HBM	-	Health Belief Model
ICT	-	Information and Communications Technology
IPMA	-	Importance-Performance Matrix Analysis
IS	-	Information Systems
PBC	-	Perceived Behavioural Control
PLS	-	Partial Least Square
PLS-SEM	-	Partial Least Square and Structural Equation Modelling
PSE	-	Perceived Severity
PTH	-	Perceived Threat
SDF	-	Socio-demographic factors
SEM	-	Structural Equation Modelling
SLR	-	Systematic Literature Review
SM	-	Social Media
SN	-	Subjective Norm
TAM	-	Technology Acceptance Model
TPB	-	Theory of Planned Behaviour
TRA	-	Theory of Reasoned Action
VIF	-	Variance Inflation Factor
WHO	-	World Health Organisation

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CHAPTER 1

INTRODUCTION

1.1 Overview

Obesity has become a global health concern and is now One of the leading causes of illness and mortality in the world's population (Chen et al., 2022). According to present trends, one in every five person in the globe will be affected by obesity by 2025. One-Third of those will be suffering from severe Obesity (BMI more than 35 kg/m²) and will be at high risk of developing other non-communicable diseases (NCDs) that would necessitate medical intervention (www.worldobesity.org). Obesity rates are increasing in high- and low-income countries affected by this epidemic (Gupta and Garg, 2020). In Sub-Saharan Africa, obesity prevalence rates are rising with 20% to 50% of the population considered fat (Danquah et al., 2020).

Obesity is a major issue in Sudan, especially among women. Obesity and overweight issues are more common among Sudanese urban women than in rural women. Owing to a multitude of interconnected variables, such as the shift to sedentary lifestyle and strongly rooted customs and traditions in the Sudanese society (Attia, 2018a; Danquah *et al.*, 2020). Obesity in women is one of the most serious non-communicable diseases and poses significant economic challenges. It is closely linked to rising medical costs as obesity during pregnancy is linked to a higher risk of serious maternal and neonatal complications, with the incidence of a series of malformations significantly increasing in women with a BMI greater than 30 kg/m² (Omar et al., 2020). Obesity must therefore be tackled early in developing countries in order to restrict and minimise adverse effects on healthcare systems (Angawi and Gaissi, 2021; Chooi et al., 2019).

Sudan Republic's wide range of cultures, traditions, and habits contribute to rising obesity rates, particularly among women (Abdalla and Abdulraheem, 2016; Magied et al., 2019). Obesity among women is viewed as a sign of wealth and luxury in the Sudanese society. It is a source of pride and admiration because of the social misinterpretation of body image. As a result, families take great care to feed women before marriage by giving them food high in carbohydrates and fat to assist them in gaining weight in preparation for the wedding (Elfaki et al., 2017; Omar et al., 2020). The World Health Organization (WHO) report indicates a tremendous increase in the rate of obesity in Sudan, particularly among women (Abdalla and Abdalla, 2017). Sudan's economy has improved in recent years, which has altered the lifestyles of its population. This transition appears to have changed the dietary choices in some metropolitan areas and resulted in a shift in lifestyle towards more sedentary behaviours (Omar et al., 2020). It is critical to recognize that resolving the obesity epidemic will need both individual and institutional actions (Ahmed et al., 2017; Lecube et al., 2017).

Several initiatives have been developed recently for the usage of SM technology for tackling the global obesity problem. Numerous studies have shown the efficacy of SM interventions in combating obesity (Cesare *et al.*, 2019; Jane *et al.*, 2018; Waring *et al.*, 2018b). The systematic literature review (SLR) investigates existing studies related to the utilization of SM for weight loss. It outlines that the use of SM for weight loss activities is rapidly increasing in industrialized countries. Despite the availability and expansion of these platforms in low income countries, the existing studies failed to fully capitalize on the benefits of these platforms to address the issue of obesity globally (Soheylizad and Moeini, 2019).

Moreover, the SLR outcomes showed limited theoretical basis for using SM to lose weight. However, the majority of these prior studies had focused on the role of SM in tackling weight loss from a descriptive or content analysis perspective (Hawkins et al., 2020; Riley and Chakradhar, 2019). However, there is still a lack of studies on the intention to use SM for weight loss in low income countries. Additionally, no empirical research has clearly explained and theorized the behavioural intention of using SM for this field in Sudan.

Furthermore, despite the broad range of behavioural intentions theories in the information system (IS) domain (Hagg et al., 2018; Lim, 2018), there is a lack of theoretical frameworks that use SM for weight loss. It is well established that the employment of theories contributes to the success of interventions (Gaube et al., 2019; Saslow et al., 2017). Meanwhile, it was identified that the absence of a theoretical framework leaves a significant gap and therefore, these circumstances that have motivated this study; this literature proves that despite the wide range of theories in the IS domain, only a few of the researchers have used multiple approaches in relation to the intention of using SM for weight loss (Lozano-Chacon et al., 2021). It is worth noting that most previous studies that used the theoretical foundation in adopting SM in weight-loss activities focused primarily on the technical aspects (Ilhan, 2018; Petersen et al., 2019). While ignoring users' health concerns and perception factors such as perceived susceptibility and seriousness, as well as a perceived threat which is defined as an individual's cognitive assessment of the likelihood that danger will affect them (Sheppard and Thomas, 2021). Despite the fact that perceived threat is a key towards predicting adaptive health responses and plays an important role in explaining individual health-related behaviour, the literature on health behaviours generally supports the idea that perceived threat increases precautionary behaviour (Irshad et al., 2020). Nonetheless, it is notable that the significance of perceived threat has been overlooked in studies on technology adoption in the health domain.

In contrast, the integration of theories gives a sound theoretical foundation and increases the efficacy of interventions (Momani and Jamous, 2017; Taherdoost, 2018). The main goal of this study is to fill the gap in knowledge and practice by gathering empirical evidence on the essential factors of the intention of using SM-bases for weight loss aims in order to develop a behavioural intention model entailing the usage of FB for weight loss among young Sudanese women. Applying a theoretical model examining the intention to use FB for weight loss is helpful because it provides a framework for identifying the determinants of a successful intervention.

Based on a review of prior research, numerous intention-based IS theories and models are available as study models (Lai, 2017). These have been tested by attempting to understand the determinants with three different IS usage stages. The

first stage includes behavioural intention to use technology and consider adopting it. The second stage represents the adoption and actual use of the technology, and the third stage outlines the continuous use of the technology (Ajzen, 1985; Ajzen, 1991b; Ajzen and Fishbein, 1975; Davis, 1989; Davis and Venkatesh, 1996; Hochbaum et al., 1952; Venkatesh and Bala, 2008; Venkatesh and Davis, 2000; Venkatesh et al., 2003a). Consequently, this current study examines the first stage of behavioural intention to use FB for weight loss. Namkoong et al. (2017) confirmed the efficacy utility of using a multi-theoretical method for predicting behavioural intentions in SM research. In conclusion, despite the numerous benefits of using SM for weight loss, the variables and determinants that lead to behavioural intention to use have received less attention; as far as we know, despite the numerous benefits of using SM for weight loss, the variables and factors that lead to behavioural intention to use have received less attention. The TPB proposes a theoretical framework based on the predictability and comprehension of intention and behavioural outcome. According to Wanichavorapong and Yusof (2017), the standard TPB only varies by 39% to 27% depending on various behaviours. However, (Pavlou and Fygenson, 2006) acknowledged that the theory accepts other extensions to increase the predictability. Thus, the current study looked at factors related to users' health beliefs as well as factors related to technical beliefs in order to develop and validate a comprehensive model for using FB for weight loss among young women in Sudan.

1.3 Problem Statement

As mentioned in the research problem background, despite the widespread SM with low-cost availability in Sudan, particularly among young people of all genders, the research is still a long way from taking advantage of SM to address obesity and overweight issues, given that obesity in women has increased in Sudan and is now considered as one of the most significant health problems (Ahmed et al., 2017; Mita et al., 2016; Omar et al., 2020; Samadi, 2018). Despite the popularity of using such platforms which can achieve significant success in health behaviours research, particularly in health promotion activities such as weight loss interventions, the use of SM in weight loss is vital for comprehending users' behavioural intentions (Ahmed et

al., 2017; Omar et al., 2020). Meanwhile, the lack of a theoretical framework is regarded as a critical gap in the literature related to weight loss research using SM.

Currently, empirical studies based on theoretical models that explain behavioural intentions of using SM for weight loss in low income countries are limited (Hagg et al., 2018; Mita et al., 2016; Samadi, 2018). In the context of Sudan, the existing evidence shows that no empirical study has clearly explained the behavioural intention to use SM-based weight loss intervention.

Prior research on SM use for weight loss interventions mainly focuses on individual characteristics, for instance, socioeconomic status or contextual factors such as social and functional support (Cavallo et al., 2021; Napolitano et al., 2017). However, they ignore the importance of health beliefs and examine their impact in conjunction with behavioural, normative, and control beliefs.

Accordingly, the first research imperative of the present study is to investigate these potential factors that influence the behavioural intention to use FB for weight loss in order to develop a comprehensive validated model to enhance behavioural intentions to use Facebook for weight loss among young women in Sudan.

1.4 Research Questions

Based on the problem background and problem statement, the focus of the current study is *“How can Sudanese young women be encouraged to uses Facebook for weight loss?”* Based on this main question, three sub-questions have been formulated as follows:

1. What factors influence behavioural intentions to use FB for weight loss among young women in Sudan?

2. How to develop and validate an integrated research model that aims to foster behavioural intention to use FB for weight loss among young women in Sudan?
3. Which is the most critical factor influencing young women's behavioural intention to use FB for weight loss among young women in Sudan?

1.5 Research Objectives

The main objective of this study is to develop a theoretical model, specifically *“To develop a model to encourage young women in Sudan to use Facebook for weight loss?”*. Three interconnected objectives were developed based on the above research questions, as follows:

1. To identify factors influencing behavioural intention to use FB for weight loss among young women in Sudan.
2. To develop and validate an integrated research model that aims to foster the Intention to use FB for weight loss among young women in Sudan.
3. To identify the most critical factor influencing behavioural intention to use FB for weight loss among young women in Sudan.

1.6 Scope of the Research

The aim of the current study is to develop a model to encourage young women (from 18 to 33 years old)(Lee *et al.*, 2018) to use FB for weight loss , This age group was selected because they are the most likely to be overweight and most susceptible to the problems that obesity poses on their health (Pengpid and Peltzer, 2022). Since the most popular platform in Sudan is FB, it was hence chosen in this study. Because Khartoum is Sudan's capital, it has the highest population density. It was chosen as the

study site because its residents reflect all of Sudan's numerous ethnic, regional, and cultural groups. The study's target group is young women who are obese or overweight and use FB. To confirm that samples meet the scope of this study, the data collection was conducted in gymnasiums and fitness centres that are likely to be frequently visited by young women. Due to the nature of SM, this study aims to identify a variety of factors that may influence an individual's intention to use SM for weight loss. The scope of this study from SM is FB. Given that the study's scope is limited to young women, neither gender nor education level was included as a variable in the correlations between the studies constructs. Furthermore, level of education was not taken into account in the analysis because SM use has become common among a wide range of people and has no relation to education level (Azizi et al., 2019). As a result of the multiplicity and different cultures and races in Sudan (Adam and Taha, 2022), the scope of this study is beyond solving the issues of cultures and traditions. In this research, a positivism approach was used as the research paradigm. A survey method was employed using paper-based questionnaire. The collected data was tested using Structural Equation modelling adopting the partial least square approach, the Smart PLS (3.0 v) software was employed as the data analysis tool.

1.7 Significance of the Research

Obesity and overweight rates are increasing worldwide due to a variety of circumstances, particularly in Sudan, which is one of the low income countries facing economic issues. Obesity is considered one of the health care risks in Sudan (Mohamed, 2018; Nour, 2021). The use of social media for health-related issues has opened up new channels for health care and empowered people to participate in activities that can help solve health problems, particularly those involving human behaviours, for example, the issue of obesity. These platforms can be used to support and encourage individuals in their attempts to lower their obesity risk. By using the SLR approach, this study collects, analyses, and synthesizes existing literature on using social media in weight loss-related activities,

This study adds to the body of knowledge a comprehensive theoretical model for using Facebook for weight loss among young women in Sudan by integrating the health belief model (HBM) and the Theory of Planned Behaviours (TPB). The present study can assist health care practitioners, decision-makers, and website designers in better understanding how the intention to use SM for weight loss can address the problem of obesity and its repercussions which pose a threat to health economics.

1.8 Definitions of Terms:

Table 1.1 presents the definitions for the terminologies used throughout the study to make them easier to understand.

Table 1.1 Definitions of terms

Term	Definition
Social media	SM is a collective term for websites and applications which focus on communication, community-based input, interaction, content-sharing, and collaboration.
Facebook	FB is widespread and is the largest social networking site in the world. It is a free social networking website that allows registered users to create profiles, upload photos and quotes about themselves, and respond or link to the information posted by others.
Perceived susceptibility	The degree to which an individual feels at risk for a health problem or condition i.e. the subjective perception of the risk of developing a health problem (Janz and Becker, 1984)
Perceived seriousness	The belief that a person is predisposed to a severe health problem, disease, or condition (individuals' perceptions of the disease's seriousness or severity) (Hochbaum <i>et al.</i> , 1952).
Perceived threat	The belief that a person is susceptible to a severe health problem, disease, or particular condition (Rosenstock <i>et al.</i> , 1988)

Term	Definition
Attitude	Attitude refers to evaluating an individual about how favorable or unfavorable an act is. The current study defined Attitude as the degree to which the individual has positive or negative personal feelings in using FB for weight loss (Davis <i>et al.</i> , 1989)
Subjective Norm	This term refers to the belief that essential persons or groups of people will support and approve particular behaviors, or in another sense, the degree of perceived social pressure from others to adopt specific behaviors (Kernot <i>et al.</i> , 2013)
Perceived Behavioral Control	A person's beliefs about issues that will make it easy or hard to perform the specific behavior (Lowe-Calverley and Grieve, 2018)
Sociodemographic factors	Sociodemographic factors, age, race, ethnicity, language, income, and education can influence behavior. The current study suggests that education and economics have a positive moderating effect in the relationship between attitude, subject norm, and perceived behavioral control and behavioral intentions to use FB for weight loss among young Sudanese women (Reiners <i>et al.</i> , 2019).
Behavioral Intention	The perceived likelihood of the individual carrying out the particular behavior (Conner, 2020)
Systematic Literature Review	SLR is used to identify, evaluate, and interpret all available research studies related to the area of analysis, research questions, and a new research trend.
Structural Equation Modelling	This tool supports researchers in testing the model's overall fit and examining the relationships between the conceptual model constructs together (Hair <i>et al.</i> , 2011).
Important Performance map Analysis	This is an advanced test in SmartPLS software used for identifying the essential factors in the model.

1.9 Organization of the Study

The study investigates the factors affecting the behavioural intentions of young Sudanese women in using FB for weight loss and suggests a behavioural intention model for FB use for weight loss purposes among young women in Sudan. Using a cross-sectional survey design, the research aims to gather information from young Sudanese women regarding their experiences and attitudes. Partial least square structural equation modelling techniques based on the Partial Least Square Structural Equation Modelling was used to examine the acquired data (SmartPLS.3). Results can be employed to develop a behavioural intention model that is both valid and dependable for the purpose of using Facebook as a weight-loss diet. Accordingly, the research is organized into six (6) chapters, which are structured in the following order:

Chapter 1 – Introduction. This chapter provides a brief overview of the study, its context, and the research problem. The objectives of the study are highlighted as well as the study's significance, scope, and organization.

Chapter 2 – Literature Review. The first section of the review begins with a general overview of the obesity problem in Sudan. Next entails a review on SM and its potential benefits to the health domain and health behaviour. Next is a systematic review of the use of social media for weight loss. The theoretical foundation for this study is laid out in the third section of this chapter, which includes a critical analysis of relevant theories on the intention to use IS/IT. The chapter concludes with a description of the model's variables.

Chapter 3 – Research Methodology. This chapter discusses the appropriate research paradigm. Additionally, the methodology for conducting the research is demonstrated, which serves as a guide for the research process. The research design is then presented, along with a detailed description of its operational framework, which includes all phases of the study. A variety of methods and tools are described in order to ensure that the research findings are validated and delivered reliably at each phase.

Chapter 4 Model Development and Instrument Validation. The preliminary research model, which is based on the findings of the literature review, is developed in this chapter. In addition to the research hypothesis, this chapter includes a detailed construct explanation that includes the study's context. Finally, a pilot survey was conducted to improve the final research instrument used in this study, and the research hypothesis was proposed. The research model is introduced in this chapter.

Chapter 5 – Data Analysis. This chapter presents the main data analysis relating to the testing and theory development for the proposed model by applying the Structural Equation Modelling (SEM) analysis with Smart PLS analysis software.

Chapter 6 – Conclusion and implications. This chapter describes the research accomplishments that have resulted from this research. It concludes with a discussion of the research outcomes' contributions, the research's limitations, and future research suggestions.

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