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Healthy lifestyle and behavioural intentions: the role of self-identity, self-efficacy, subjective norms, and attitudes

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ABSTRACT

This study aims to investigate the influence of health self-identity, self-efficacy beliefs, and subjective norms on healthy lifestyles and, in turn, behavioural intentions. Health attitude is also considered a crucial underlying mechanism for understanding health-promoting behaviours. The study used a covariance-based structural equation modelling to test the proposed conceptual model with 493 South African consumers. The results show that health self-identity and self-efficacy beliefs influence healthy lifestyles and, in turn, influence behavioural intentions (e.g. smartwatch use, healthy eating, and physical exercise). Further, the results show that a healthy lifestyle mediates the relationship between healthy self-identity and behavioural intentions. Subjective norms do not directly influence a healthy lifestyle but behavioural intentions. The lack of mediational influence of a healthy lifestyle between subjective norms and behavioural intentions suggests that subjective norms independently predict health-promoting behaviours. Finally, healthy lifestyles predict health attitudes, but health attitudes do not explain behavioural intentions. The results suggest that social marketers and brand managers should focus more on personal attributes (i.e. health self-identity and self-efficacy beliefs) than social factors (e.g. subjective norms) to improve healthy lifestyles and health-promoting behaviours. This study adds to the growing body of knowledge on healthy lifestyles by highlighting its underlying mechanisms.

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Healthy lifestyle; healthy self-identity; subjective norms; self-efficacy; health attitudes; behavioural intentions

1. Introduction

The growing demand for health-related products globally is a testament to consumers' desire and efforts to attain general well-being (Malcorps, 2019). Globally, unhealthy lifestyles have led to a public health crisis with serious health issues ranging from obesity, high blood pressure and strokes (World Health Organization, 2014a). For example, the direct cost of obesity-related illness in the United States was estimated to be as high as \$147 billion (Finkelstein et al., 2009). Similarly, the European Union has observed a 52% surge in adult obesity and urged member states to take drastic steps to reduce pressures on health systems through unhealthy lifestyle behaviour changes (Euro Commerce, 2018).

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In Sub-Saharan Africa, unhealthy lifestyles have significantly affected a vulnerable health system (World Health Organisation, 2014b). The increased alcohol-related trauma cases in South African hospitals during COVID-19 lockdowns further amplifies these vulnerable health systems (Barron et al., 2020). In South Africa, the cost of treating the consequences of diabetes, hypertension, and hypercholesterolemia is estimated at \$34.2 billion a year, representing roughly 10% of South Africa's Gross Domestic Product (Davies & Wagner, 2019). The surge in lifestyle-related diseases has created a national Healthy Lifestyle Day dedicated to intensive media awareness on the dangers of unhealthy eating and sedentary lifestyles (South African Department of Health, 2020).

Despite these efforts to create awareness and promote healthy living, there seems to be a paucity of research on the impacts of a healthy lifestyle on health products' purchase intentions as a baseline for promoting healthy living (Odunitan-Wayas et al., 2018). Healthy behavioural intentions are described as a person's willingness to participate in physical activity, monitor their health and healthy diet. Previous studies explain why lifestyle diseases prevail, with reasons ranging from unhealthy diet, physical inactivity, stress, environmental factors, lack of health education and demographic variables such as age. These factors cumulatively predict the consequences of an unhealthy lifestyle such as heart disease, diabetes, chronic liver disease, hypertension and stroke (Sharma & Majumdar, 2009). To reverse this trend, prior studies suggest that psychological motivational drivers can lead to healthy lifestyles positive health attitudes and intended behavioural outcomes (Melzner et al., 2014). Yet few studies have considered the role of such factors as health self-identity, healthy lifestyle, health attitudes and subjective norms as an effective mechanism for promoting healthy behavioural outcomes. For example, Chen (2009) found that a healthy lifestyle served as a crucial route for health consciousness and environmental attitudes to predict attitudes towards organic food preference. More recently, Quaye et al. (2021) empirically established that health self-identity was a crucial force promoting health consciousness, consumer knowledge of healthy living, self-efficacy and normative beliefs guiding healthy behavioural outcomes.

Although health self-identity and self-efficacy are important determinants of healthy living, deficits remain in our understanding of how a healthy lifestyle serves as an important route to influence healthy behavioural intentions. There is a need to further understand how a healthy lifestyle promotes health attitudes to health target behaviours. To our knowledge, combining healthy self-identity, self-efficacy, subjective norms, healthy lifestyle and health attitudes in a constellation of factors to successfully impact healthy behavioural intentions is presently lacking. The foregoing phenomena necessitate a holistic view of other personal factors that have the potential to enhance healthy living and overcome such barriers to consumers' intention to purchase healthy foods and partake in health-promoting activities (see: Ali et al., 2018). We draw on the theory of planned behaviour (TPB) and self-concept theory to account for the outcomes in this study. TPB is usually adopted as a useful framework for explaining behavioural intentions. Key among its predictions is that people's intentions are influenced by their attitudes, social norms and perceived behavioural control (Ajzen & Fishbein, 1977). Self-concept theory also describes an individual's sense of their identity out of which flows their cognitions and behaviour (Reed, 2002).

Therefore, the current study offers a significant contribution to the existing literature on predictors of healthy lifestyles and behavioural intentions. First, we demonstrate the

possibility of enriching the theory of planned behaviour by including healthy self-identity and healthy lifestyle in an organised framework for predicting healthy behavioural intentions. We add to the literature by showing that healthy self-identity and self-efficacy are powerful predictors of a healthy lifestyle. A crucial insight found in this study is that contrary to expectations, normative influence through subjective norms did not explain a healthy lifestyle, pointing to the need to offer contextual underpinnings to often taken-for-granted cultural drivers of behaviour. Practically, the results should inform health communities, practitioners and marketers that health self-identity can improve healthy behavioural intentions when healthy lifestyles are carefully promoted.

2. Conceptual background and hypothesis

2.1. *Extended theory of planned behaviour*

The theory of planned behaviour (TPB) by Ajzen and Fishbein (1980) describes how behaviour is determined by a combination of a person's intentions to behave in a certain way and their perception of control over the behaviour. According to the theory, intentions are the single most vital determinant of human behaviour and intentions are held to be predicted by three factors. First, attitudes towards the behaviour explain a person's overall positive or negative evaluation towards performing the behaviour (Povey et al., 2000). Second, subjective norms describe a person's view of whether others would want them to engage in the behaviour (Povey et al., 2000). Third, perceived behavioural control describes a person's consideration of the degree to which internal or external factors may prevent or enhance behavioural performance (Povey et al., 2000).

Furthermore, Ajzen (1991) suggested that TPB was amenable to further extensions if additional predictors, when added could account for significant variance, over and above the TPB factors. Increasingly, studies extend the TPB with new variables to improve its predictive power (Jackson et al., 2003). Therefore, this study includes self-identity and healthy lifestyle in predicting health behavioural intentions. Also, a clear distinction is usually made between self-efficacy, which explains faith in one's ability to perform the behaviour, and perceived behavioural control, which explains the extent to which a person perceives whether or not the performance of a behaviour is within their control. Previous studies show that self-efficacy is a better predictor of behavioural intentions than perceived behavioural control (Povey et al., 2000; Norman, 2011; Ram & Laxmi, 2017), hence self-efficacy is utilised in this study. Ultimately, TPB has become a useful framework for examining the influence of personal determinants and social influences as well as non-volitional predictors of intention for healthy living just like other behaviours (Jackson et al., 2003; Norman, 2011; Rex et al., 2015).

2.2. *Self-concept theory*

The concept of self may be traced back to the 3000-year-old Ahamkara philosophy, which explains the totality of opinions and social factors individuals use for ascription and self-identification (Mehrad, 2016). Self-concept and identity are often used interchangeably; although self-concept serves as a theory of who a person is and may become, it is often activated through various personal and social identities (see Craven & Marsh,

2003; Marsh et al., 2012; Oyserman, 2009). Thus, identity-based motivations are assumed to underlie many behaviours (Oyserman et al., 2012). People who integrate specific identities into their self-concept are likely to behave consistently (Bandura, 1990; Oyserman et al., 2012). Shavelson et al. (1976) conceptualised self-concept as a person's perception constructed through experience within an environment or an ecosystem. Shavelson et al. (1976) also highlighted the influence of close relatives on self-concept reinforcements. Far from static, self-concept acts as an assumed dynamic construct for explaining actions measured through peer and significant others' influence, physical ability, and physical appearance (Shavelson et al., 1976).

Multicultural views are an essential element of the external environment that greatly influences self-concept (Fazli-Salehi et al., 2021). The prevailing culture, primarily driven by societal norms, promotes self-using social referent groups as vehicles of norm enforcement and conformance (Cislaghi & Heise, 2020). For example, most individuals perceive themselves as part of the collective in Africa, Latin America, and Asia. The forgone means interdependent on social networks due to closed cultures influencing self-concepts more than in distance cultures such as in Europe and North America where individuality and independence of self are amplified (Swann et al., 2012).

2.3. Self-concept and healthy-lifestyle

A healthy lifestyle is conceptualised as people's actions to maintain health-promoting behaviours, their rationale, and the ramifications of those actions (Giles & Brennan, 2015). It is usually measured contextually based on specific healthy lifestyle choices such as eating healthy and exercising (Chen, 2011; Mai & Hoffmann, 2015). The self-concept construct is vital to individuals' psychological well-being; hence, its association with individuals' awareness of their qualities and limitations (World Health Organisation, 2014b). Individuals who feel good about themselves and their abilities are largely considered resilient to everyday living challenges. Their positive self-concept promotes positive affective emotions such as happiness, motivation, and reduced anxiety (Lohbeck et al., 2018). We should consider Shavelson et al. (1976) general self-concept on non-academic domains and other subdomains when linking self-concept to a behavioural attribute such as a healthy lifestyle. Non-academic domains represent social and affective self-concepts. According to Shavelson et al. (1976), physical self-concepts (physical perceptions) are divided into perceived physical ability and perceived physical appearance.

Perceived physical ability catalyses various social cognitive concepts such as self-determination (Weiss, 2000). In physical activity, for example, the perceived ability is operationalised as performing a specific rigorous sports activity that exerts energy (Harter, 1982). Similarly, perceived physical appearance drives the intention to purchase healthy products to enhance self-image (Hanspal & Devasagayam, 2017). Indeed numerous studies have established the link between the concept of self and different forms of healthy lifestyles, such as physical activity, healthy food choices, dieting, and quitting social vices such as smoking and alcohol consumption (see: 2020; Godrich et al., 2019; Ibrahim et al., 2022; Lindgren et al., 2017). This paper uses self-concept theory, TPB and healthy lifestyle concepts as overarching theoretical foundations to develop a unified conceptual framework (see Figure 1). In the conceptual framework, we expect a healthy self-identity, self-efficacy, and subjective standards to predict a healthy lifestyle. A healthy lifestyle

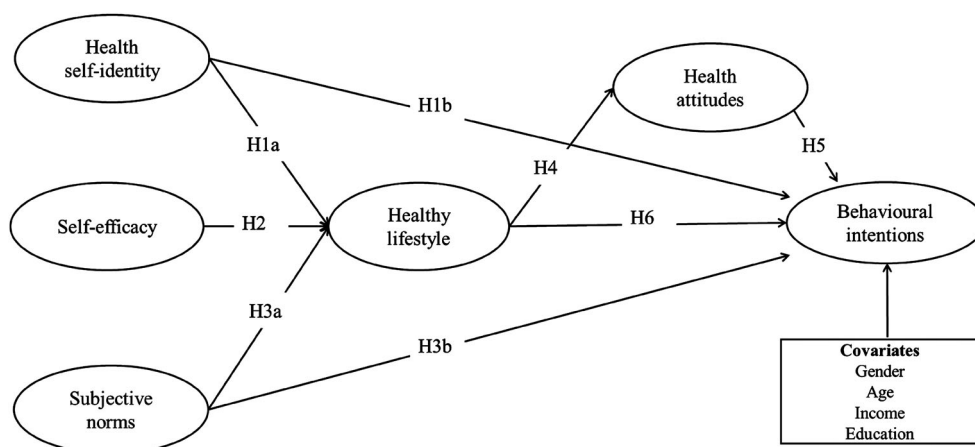


Figure 1. Conceptual framework.

would predict health attitudes and behavioural intentions in a mediating mechanism. We discuss all the hypotheses in the following sections.

2.4. Hypotheses development

2.4.1. Health self-identity and behavioural intentions

An individual array of habits formed over time is linked to self-concept (Verplanken, 2018). Developing these habits implies that people who self-identify with a healthy lifestyle practice healthy habits over time (Gardner, 2015). There is a plethora of evidence on the influence of healthy self-identity on the intention to act healthy. For example, Gao et al. (2020) recently found that individuals with a history of diabetes took to physical activities more frequently, driven by the motivation to stay healthy. Earlier, Sánchez-Miguel et al. (2017) similarly identified self-identity as a good predictor of intentions to exercise, although they found significant gender differences in self-identity. In 2012, de BruijnBas and Putte also found self-identity to predict behaviour intentions, albeit within a non-African context. Sharma et al. (2020) also report that consumers who maintain a green self-identity and self-concept are likelier to purchase green products.

Even though the extant empirical literature suggests that health self-identity predicts behaviour intentions, contextually, it may offer varying effects on the intention to engage in health-promoting behaviour due to localised constraints. For example, in South Africa, there are many barriers to engaging in health-promoting activities, such as the high cost of organic foods, fruits and vegetables and access to gyms. We suspect that those who self-identify with health would persist amidst these barriers and hence hypothesise that:

H_{1a}: Self-identity has a positive effect on behavioural intentions.

2.4.2. Health self-identity and lifestyle

Healthy lifestyles have been conceptualised as efforts to achieve holistic well-being (Mokdad et al., 2005). People who desire healthy outcomes such as staying fit and maintaining a healthy body image are observed to strive to attain these health goals (Jin et al.,

2017). The existing studies on the linkage between self-concept and healthy lifestyles tend to focus on specific health-related lifestyles, such as healthy food choices (Bisogni et al., 2002; Korn et al., 2013). Therefore, Oyserman et al. (2012) called for more empirical evidence on generic healthy lifestyle behaviours on the individual concept of self.

Hanspal and Devasagayam (2017) found that consumers with healthy self-images differ in how they perceive themselves regarding both body image and preference for healthy labelled food. Dominick and Cole (2020) also found that people who think of their health goals as identities are more likely to engage in healthy goal-consistent behaviours. Similarly, Korn et al. (2013) found a high correlation between positive self-body image, health perception, and appropriate nutrition, akin to a healthy lifestyle. In contributing to the growing literature on generic healthy lifestyle behaviours and the influence of self-identity, this study hypothesises that:

H_{1b}: Self-identity has a positive effect on a healthy lifestyle.

2.4.3. Self-efficacy and a healthy lifestyle

Self-efficacy is “people’s belief about their capabilities to exercise control over their level of functioning and over events that affect their lives” (Bandura, 1991, p. 257). Concerning a healthy lifestyle, self-efficacy plays a dominant role in healthy lifestyle behaviour uptake (Padden et al., 2012). Previous studies (Muturi et al., 2016) found a positive correlation between self-efficacy and healthy food choices. Mai and Hoffmann (2012) explain that consumers with nutrition self-efficacy engage deeply with health-related information to influence their healthy lifestyles. Jackson et al. (2014) reported that health self-efficacy predicted higher engagement in a healthy lifestyle. Similarly, Ram and Laxmi (2017) also found self-efficacy to positively influence healthy lifestyle promotion. In gauging the effect of self-efficacy within an African social context, this study believes that it will play a vital role in determining healthy lifestyle behaviour; hence hypothesises that:

H₂: Self-efficacy has a positive effect on a healthy lifestyle.

2.4.4. Subjective norms, healthy lifestyle, and behavioural intentions

Subjective norms are the perceived social pressure to engage or not engage in a particular behaviour (Norman, 2011). The theory of planned behaviour specifies that subjective norms predict behavioural intentions and actual behaviour (Ajzen, 1991). Subjective norms describe “the extent to which important others would approve or disapprove of the performance of given behaviour” (Ajzen, 1991, p. 195). The social pressures to conform may come from family, friends or colleagues, driven by collective social group interest (Martin et al., 2008). Pressures exerted by close relatives or social groups may encourage individuals to emulate healthy lifestyle behaviours or green consumption habits (Khare, 2014; Paul et al., 2016; Singh & Verma, 2017).

The influence of subjective norms in driving the performance of healthy lifestyle behaviour is contingent on the social context (Pasick et al., 2009). In consumer behaviour research, subjective norms are associated with various behavioural intentions, such as organic food consumption (Dean et al., 2012), environmentally conscious consumption (Khare, 2014), and intentions to purchase green products (Paul et al., 2016). Twene-boah-Koduah et al. (2019) found that subjective norms, perceived usefulness and ease

of use explained the adoption of physical activity. Hansen et al. (2013) also report subjective norms expressed through peer pressure influenced the choice of purchased snacks for adolescents. In this study, we expect subjective norms to strongly affect healthy lifestyle behaviour in conformance to the expectations of significant others. Hence, we hypothesise that:

H_{3a}: Subjective norm has a positive effect on a healthy lifestyle.

H_{3b}: Subjective norm has a positive effect on behavioural intentions.

2.4.5. *Healthy lifestyle and healthy attitude*

According to Giles and Brennan (2015), people disposed to a healthy lifestyle take to physical activity and other efforts that promote well-being. Disposition makes for easier lifestyle changes and adaptations towards well-being (Schwarzer, 2008). Attitude toward a behaviour describes the “degree to which a person has a favourable or unfavourable evaluation of the behaviour in question” (Ajzen, 1991, p. 188). Health attitudes highlight people’s likes or dislikes, positive or negative, and favourable or unfavourable evaluations of health-promoting beliefs. Indeed, healthy lifestyles and healthy attitudes are two concepts that have reverse causality tendencies (Krishnan & Zhou, 2019). For example, the existing healthy lifestyle literature shows that people who live healthy lifestyles inherently adopt an attitude that promotes such behaviours (see: Andrade et al., 2017; Krishnan & Zhou, 2019; Santiago et al., 2017), conversely, a positive attitude towards healthy living is exhibited in daily routines that guarantees the execution and sustenance of such behaviours (Pandey et al., 2021). Previous studies have established the effect of a healthy lifestyle disposition on the ability to act on improving health attitudes. Pickard et al. (2018) found that adopting a healthy lifestyle predicts a positive attitude towards health activities. Blake et al. (2017) also found that pre-registered nurses exhibited poor attitudes towards health promotional activities due to their poor healthy lifestyle disposition. Also, Chen (2009) reported that Taiwanese consumers with a healthy lifestyle expressed positive attitudes towards organic foods. Thus, we anticipate that healthy people will favourably evaluate health-promoting behaviours and act according to such beliefs. Thus, we hypothesise that:

H₄: Healthy lifestyle has a positive effect on a healthy attitude.

2.4.6. *Health attitude and behavioural intention*

Attitude represents the individual’s negative or positive evaluation of healthy lifestyle behaviour (Rex et al., 2015). The attitude construct strongly predicts behavioural intentions in many domains (Ajzen & Fishbein, 2005). A person’s readiness to plan may vary with more or less positive expectations regarding healthy lifestyle choices (Hankonen et al., 2014). Previous studies have found a healthy attitude to predict health-related behavioural intentions. Specifically, Poobalan et al. (2012) established a strong positive effect of attitude on engagement in physical activity.

Similarly, Nguyen et al. (2020) also depicted attitude as a strong predictor of consumers’ intention to buy functional, healthy foods. Generally, in the physical activity domain studies, attitude is relatively low in sustaining momentum, thus accounting for the high relapse rate among people who initiate physical activities (Kwasnicka et al.,

2016). Paul et al. (2016) confirmed a strong link between attitude and green product purchase intentions. Thus, we expect a positive health attitude to increase favourable behavioural intentions for healthy choices.

H₅: Health attitude has a positive effect on behavioural intentions.

2.4.7. Healthy lifestyle and behavioural intentions

Within social marketing, healthy lifestyles are a balance of healthy food intake, avoiding social vices such as smoking and alcohol consumption, and engaging in physical activities (Ali et al., 2018). Individuals who adopt healthy lifestyles have gone through several motions of overcoming barriers to lifestyle changes, such as marketing promotional activities and negative social norm pressures (Hastings et al., 2000). Once individuals have accepted healthy lifestyle behaviour, they are motivated by the gains of staying healthy. They try to eat healthily, engage in physical activity, and avoid health-related social vices (Donovan, 2011).

Research into healthy lifestyle dispositions and the intention to engage in health-related behaviours have targeted different health-related behaviours such as smoking, alcohol consumption and physical activity. Still, healthy lifestyle behaviour studies have generally been limited (Truong, 2014). However, previous studies have established the nexus between specific healthy lifestyle dispositions and behavioural intention (Chen, 2011). For example, Giles and Brennan (2015) observed that young people would take action on their current lifestyles if the benefits were tangible and realistic. Chen et al. (2011) reported that consumers with healthy lifestyles were more willing to use functional foods than their less healthy counterparts. Psouni et al. (2016) also found the desire to maintain a healthy body and physical appearance as a good predictor of engaging in physical activity and healthy eating. This study contributes to existing studies on general lifestyle and intention to act and also believes that consumers' intention to live healthily would influence intentions to act and therefore hypothesise that:

H₆: Healthy lifestyle has a positive effect on behavioural intentions.

3. Methods

3.1. Data collection and sample characteristics

The suitable sample for this study were adult consumers aged 18 years and over. The study adopts a cross-sectional research design and utilises a convenience sampling approach for data collection. Data for the study was obtained through online data collection among South Africans using the Qualtrics survey platform. The online questionnaire data collection method was used to reach a wide geographic area and diverse consumers on social media in a cost-effective manner. The data was collected over one week. The social media platforms used were Facebook and Instagram. After cleaning the responses of excessive missing data, 493 responses were used for the analysis. Responses with more than 60% missing data were deleted from the dataset. The remainder of responses with missingness completely at random were handled with full information maximum likelihood estimation approach, which was implemented in subsequent structural equation modelling analysis. Table 1 depicts the demographic profile of respondents.

Table 1. Profile of respondents ($N = 493$).

Factors	Frequency	%
Gender		
Male	53	10.55
Female	440	89.25
Age		
18–24	47	9.53
25–34	79	16.02
35–44	76	15.42
45–54	114	23.12
Over 55	177	35.90
Education		
Matric	119	24.14
Diploma	139	28.20
Bachelor's degree	110	22.31
Post graduate degree	123	24.95
Income		
R0 – R4,999	112	22.72
R5000 – R9,999	48	9.74
R10,000 – R19, 999	104	21.10
R20,000 – R29,000	94	19.07
Over R30,000	133	26.98
Employment status		
Employed	248	50.30
Entrepreneur	12	2.43
Student	40	8.11
Unemployed	49	9.94
Self employed	81	16.43
Other	63	12.78

Compared to males (10.55%), the sample was predominantly females (89.25%). The data further shows that respondents aged between 18 to 44 years were about 40.97% of the sample. This data is consistent with the general population of South Africa, which shows that as of 2022, 41% of the population were aged between 20 to 44 years old (Statista, 2022). Yet an equally higher percentage of the respondents were over 55 years (33.90%) and between 45–54 years (23.12%). Also, the participants were diverse in their educational achievement (matric [22.72%], Diploma [28.20%], Bachelor's degree [22.31%], and Postgraduate degree [24.95]), highlighting that the majority of the respondents had a diploma certificate. Lastly, a higher percentage of the respondents earned more than R30,000 monthly income (26.98%), followed by those making as little as 0 – R4,999 (22.72%). The foregoing suggests that the sample has a good spread of participants across relatively low and high-income brackets. Finally, about half of the respondents confirmed that they were employed (50.30%), while others indicated they were either entrepreneurs/self-employed (18.86%) or students (8.11%), with few employed (9.94%).

3.2. Measures

Table 2 contains all constructs and scale items used for this study based on well-established and validated scales. Health self-identity was measured with four items from Brenner et al. (2018). Self-efficacy was measured with four items from Ben-Ami et al.'s (2014) scale, and subjective norms were measured with items four items from Khare (2015). Healthy lifestyle was measured with five items by Hearty et al. (2007). Moreover,

Table 2. Constructs and measurement items.

Items	λ	CR	AVE
Health self-identity			
In general, being a healthy eater is an important part of my self-image	.74	.84	.51
Being athletic and sporty reflects who I am.	.70		
I have come to think of myself as a health-conscious person.	.81		
I identify with a community of health-conscious people.	.65		
Membership + in health clubs such as running, jogging, or cycling is part of my identity.	.66		
Self-efficacy			
I believe I can exercise non-stop for 30 minutes, 3–4 times a week.	.77	.81	.52
I believe that I can engage in exercise even if I am not in such a good mood	.73		
I believe that performance is important when I exercise	.64		
I believe that I have it in me to commit to an exercise and eating routine	.73		
Subjective norms			
When I am not familiar with a product or brand, I often ask for opinions from the people that are important to me	.80	.84	.58
When I am exploring brand options, I enjoy consulting with the people that I am close to	.87		
I often gather information from my family and friends about brands	.78		
To make sure I buy the right brand, I sometimes observe what other people are buying.	.56		
Healthy lifestyle			
I've made a conscious decision to live a healthier lifestyle	.78	.86	.55
I am conscious of my fat and sugar intake daily	.67		
I enjoy healthier lifestyle-oriented brands such as Bodyshop, Weight Watchers and Sportsman's Warehouse	.70		
I have a favourable attitude towards health-oriented lifestyle brands	.76		
Living a healthier lifestyle is fun, and I enjoy it	.80		
Health attitudes			
Negative/ Positive	.91	.95	.84
Very bad/ Very good	.91		
Unfavorable/ Favourable	.93		
Unpleasant/ Pleasant	.91		
Behavioural intentions			
I intend to buy a smartwatch to monitor my health in the near future.	.72	.77	.53
I plan to buy and eat fruits and vegetables often.	.74		
I intend to do physical activity such as running, cycling, gym, swimming, etc. on a regular basis.	.73		
CFA model fit: χ^2 (350) = 685.858, RMSEA = 0.04, χ^2/df = 1.96, CFI = 0.95, TLI = 0.94, SRMR = 0.05; λ = standardised factor loading, CR = composite reliability, AVE = average variance extracted.			

healthy lifestyle attitudes were measured with the semantic differential scale with four items from Wardle and Stepoe (2003). The measure had bipolar adjectives: “negative/positive,” “very bad/very good,” “unfavourable/favourable,” and “unpleasant/pleasant.” Lastly, behavioural intentions for smartwatch use, organic foods, and physical activity were measured with three items from Parkinson et al. (2017). Except for healthy lifestyle attitudes, all measures used a seven-point Likert scale format (from 1 = strongly disagree to 7 = strongly agree). Participants also reported their demographics. Gender, age, income, and education were used as control variables.

4. Data analysis

4.1. Measurement model validation

Confirmatory factor analysis (CFA) was used to estimate the measurement model for determining the psychometric properties of the models, using Mplus 8.3. Following Anderson and Gerbing (1988), the construct's reliability and validity were examined by establishing the fit of the measurement model. The fit statistics of the measurement model demonstrate

Table 3. Descriptive statistics and correlation matrix.

#	Constructs	Mean	SD	1	2	3	4	5	6
1	Health self-identity	2.96	.73	.71					
2	Self-efficacy	4.40	1.30	.70	.72				
3	Subjective norms	2.91	1.21	.47	.45	.76			
4	Healthy lifestyle	3.33	.76	.32	.31	.17	.74		
5	Healthy lifestyle attitudes	8.09	5.46	.86	.72	.40	.47	.92	
6	Behavioural intentions	2.85	.52	.63	.90	.30	.27	.79	.73

Note. N = 493; SD = standard deviation; values off the diagonal are square root of average variance extracted (AVE)

a good fit to the data: $\chi^2 = 685.858$, $p < .001$; $df = 350$, $\chi^2/df = 1.96$; RMSEA = .04, CFI = .95, TLI = .94, and SRMR = .05. In addition, all scale indicators loaded significantly on their respective latent construct ($p < .001$), with loadings ranging from .56 to .93. The average variance extracted (AVE) indices for each construct exceed the recommended minimum of .50, demonstrating good convergent validity (Table 2) (Bagozzi & Yi, 1988).

Finally, the discriminant validity of the scales were determined by comparing the square root of the AVE with the correlation of latent constructs. As shown in Table 3, the square root of each construct's AVE is greater than the correlation between any paired constructs, demonstrating strong evidence of discriminant validity (Fornell & Larcker, 1981). data and correlation matrix for all variables are shown in 3.

Podsakoff et al. (2003) caution about the presence of common method variance (CMV) when conducting cross-sectional research since CMV can artificially alter the results. To minimise CMV, several procedural and statistical remedies are recommended including the use of well-established scales and ensuring anonymity of respondents and careful design of questionnaires to reduce response bias (Podsakoff et al., 2003). Statistical remedies were implemented through Harman's single-factor test. According to this test, if a single factor accounts for a greater percentage of variance in the scales used, then CMV is present. Our analysis showed that the highest variance of any scales used did not exceed 38%, which sits below the 50% threshold (Podsakoff et al., 2003). Furthermore, a confirmatory factor analysis following Harman's single-factor test was used to ascertain the potential threat of CMV. This test suggests that if CMV is present, then a single latent factor should have a better fit compared to the multifactor solution. The single-factor CFA produced poor fit: $\chi^2 (230) = 2760.84$, $\chi^2/df = 12.00$, RMSEA = .15, CFI = .47, TLI = .42, SRMR = .14 when compared to the multifactor solution, collectively showing that CMV seems not to be a problem linked to the data.

4.2. Tests of hypotheses

The tests of the various hypotheses continued with an estimation of the structural path model. The model also showed satisfactory fit to the data: $\chi^2 (304) = 673.56$, $\chi^2/df = 2.22$, RMSEA = .05, CFI = .93, TLI = .92, SRMR = .06. The results show that healthy self-identity significantly influences a healthy lifestyle ($\beta = .70$, $t = 10.42$, $p < .01$), supporting H1a. However, the influence of health self-identity on behavioural intentions towards healthy living was not supported ($\beta = .08$, $t = .51$, $p > .05$). Self-efficacy beliefs have a significant positive influence on healthy lifestyle ($\beta = .22$, $t = 3.16$, $p < .01$). The more individuals perceive that they can maintain healthy living, the more likely they will lead a healthy lifestyle. Although

Table 4. Results of the structural equation modeling.

	Hypothesis/path analysis	λ	t-value	Hypothesis Supported
H1a	Health self-identity → Healthy lifestyle	.70	10.42**	Yes
H1b	Health self-identity → Behavioural intentions	.08	.51	No
H2	Self-efficacy beliefs → Healthy lifestyle	.22	3.16**	Yes
H3a	Subjective norms → Healthy lifestyle	-.01	-.29	No
H3b	Subjective norms → Behavioural intentions	.11	2.18*	Yes
H4	Healthy lifestyle → Health attitudes	.46	8.77**	Yes
H5	Health attitudes → Behavioural intentions	.08	1.33	No
H6	Healthy lifestyle → Behavioural intentions	.67	4.01**	Yes
Covariates				
	Gender → Behavioural intentions	-.08	-1.87 ⁺	
	Age → Behavioural intentions	-.30	-5.70**	
	Income → Behavioural intentions	.15	3.26**	
	Education → Behavioural intentions	.02	.54	

SEM model fit: χ^2 (304) = 673.56, χ^2/df = 2.21, RMSEA = .05, CFI = .93, TLI = .92, SRMR = .06; λ = standardised factor loading; ⁺ $p < .10$; ** $p < .01$.

subjective norms are seen not to influence healthy lifestyle ($\beta = -.01$, $t = -.29$, $p > .05$), the influence of subjective norms on behavioural intentions towards healthy living is significant and positive ($\beta = .11$, $t = 2.18$, $p < .01$). Healthy lifestyle has a significant positive influence on attitudes toward healthy living ($\beta = .46$, $t = 8.77$, $p < 0.01$) and behavioural intentions ($\beta = .67$, $t = 4.01$, $p < .01$), thus supporting H4 and H6, respectively. However, attitudes toward healthy living does not have effect on behavioural intentions ($\beta = .08$, $t = 1.33$, $p > .05$). This implies that a healthy lifestyle can independently influence behavioural intentions towards healthy choices regardless of attitudes towards healthy living— Table 4 and Figure 2 highlight all these findings.

4.3. Test of mediation

To examine the mediating mechanism in the conceptual model of Figure 1, we performed a mediation analysis following Baron and Kenny (1986) and the advanced bootstrapping

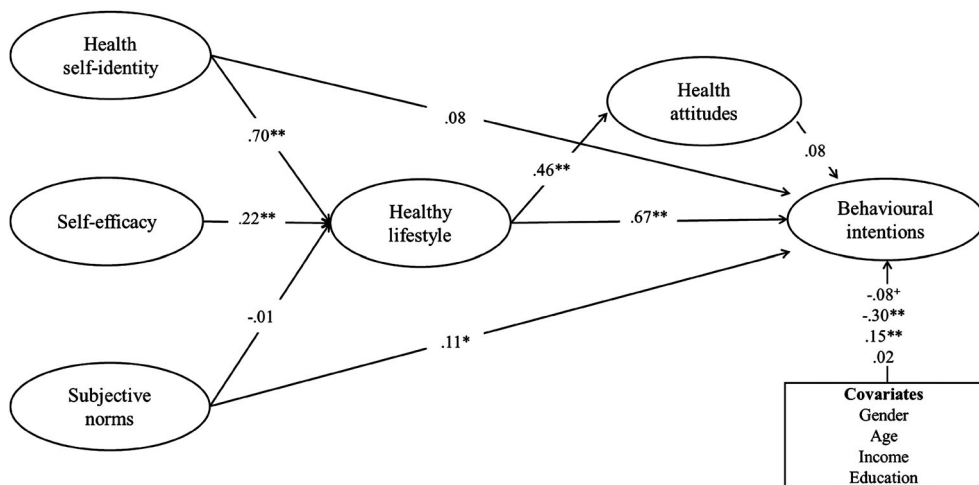


Figure 2. Path model depicting coefficients of estimation. ⁺ $p < .10$; * $p < .05$, ** $p < .01$.

Table 5. The mediation role of healthy lifestyle and health attitudes.

Path	Standardised estimate	Bootstrap bias-corrected method 95%			
		t-value	Lower	Upper	p-value
<i>Effects from Health self-identity to behavioural intentions</i>					
HSI → BI (total)	.52	7.89**	.39	.65	.00
HSI → BI (total indirect)	.44	2.97**	.19	.77	.00
Specific indirect effect					
HSI → HL → BI	.47	3.00**	.20	.81	.00
HSI → HL → ATT → BI	−.02	−1.22	−.07	.01	.22
<i>Effects from Subjective norms to behavioural intentions</i>					
SN → BI (total)	.10	1.89 ⁺	−.00	.20	.06
SN → BI (total indirect)	−.01	−.27	−.06	.04	.79
Specific indirect effect					
SN → HL → BI	−.01	−.27	−.07	.04	.79
SN → HL → ATT → BI	.00	.22	−.00	.01	.82
<i>Effects from Healthy lifestyle to behavioural intentions</i>					
HL → BI (total)	.63	3.56**	.29	.98	.00
HL → BI (total indirect)	−.03	−1.23	−.09	.02	.22
Specific indirect effect					
HL → ATT → BI	−.03	−1.23	−.09	.02	.22

** $p < .01$; * $p < .05$; ⁺ $p < .10$; Abbreviation: HSI = health self-identity, HL = healthy lifestyle, SN = subjective norms, ATT = health attitudes, BI = behavioural intentions.

method by Preacher and Hayes. Specifically, we adopted the bootstrapping bias-corrected confidence interval procedure in SEM (Mplus), with 95% confidence intervals and 2,000 samples (Xie et al., 2016). Table 5 shows a summary of the mediation results.

The findings confirm that a healthy lifestyle fully mediates the relationship between healthy self-identity and healthy behavioural intentions ($\beta = .47$, $t = 3.00$, $p < .01$). The results suggest that healthy self-identity affects healthy behavioural intentions mainly through the route of healthy lifestyles. However, a healthy lifestyle does not show a mediating effect between subjective norms and healthy behavioural intentions; neither do health attitudes mediate the relationship between a healthy lifestyle and behavioural intentions. When combined, a healthy lifestyle and healthy attitudes do not mediate the link between healthy self-identity and subjective norms to behavioural intentions.

5. Discussion and conclusion

Understanding the key antecedents and consequences of healthy lifestyle adoption is essential for effectively deploying behaviour change strategies among social marketers and brand manufacturers who use healthy lifestyle positioning concepts. This study will substantially help efforts targeted at developing healthy lifestyles and encouraging health-promoting behaviours and related products. Several theoretical and practical implications are discussed in the following sections.

5.1. Theoretical implications

Drawing on self-concept theory, TPB and identity-based motivations, the findings show that individuals who maintain a strong healthy identity maintain a strong, healthy lifestyle. This finding is consistent with previous empirical (Hanspal & Devasagayam, 2017; Korn et al., 2013; Oyserman et al., 2012). However, the findings did not support the prediction that healthy self-identity will lead to behavioural intentions for healthy living. The

forgone is inconsistent with prior empirical results, which found strong links between self-identity and purchase intentions (de BruijnBas & Putte, 2012; Von Essen & Englander, 2013; Sánchez-Miguel et al., 2017; Sharma et al., 2020). Self-efficacy beliefs also emerged as a significant predictor of healthy lifestyles in South Africa. This finding contributes to the literature that perceived self-efficacy improves a healthy lifestyle (Abadil et al., 2017; Ram & Laxmi, 2017). The finding suggests that consumers with positive self-efficacy beliefs exert more cognitive resources to engage in health-improving lifestyles (Jackson et al., 2014; Mai & Hoffmann, 2012).

Relative to the role of interpersonal influences on healthy behaviour, we find that subjective norms do not influence a healthy lifestyle, but rather influence behavioural intentions. This result is inconsistent with the observation that subjective norms are the weakest link in the intention model (Paul et al., 2016). This finding suggests that consumers do not maintain a healthy lifestyle to impress others or do not observe or conform to what others are doing before maintaining healthy lifestyles (Khare, 2014). Besides, friends, family, and peer groups may have failed to provide proper examples concerning maintaining a healthy lifestyle (Paul et al., 2016). This finding contradicts previous empirical studies where subjective norms strongly impact a healthy lifestyle (Hansen et al., 2013; Khare, 2014; Tweneboah-Koduah et al., 2019). The plausible explanation of this finding may be that personal characteristics such as self-identity and self-efficacy beliefs are more paramount in driving healthy lifestyles than subjective norms. Yet, we show that subjective norms influence favourable behavioural intentions towards healthy living. In line with literature on interpersonal influences, people may exercise individual responsibility while in a group but look to others to enact socially appropriate behaviours such as eating healthy foods, maintaining sustainable consumption practices, and exercising. Extant studies report a strong influence of subjective norms on intentions and actual purchase of organic food (Singh & Verma, 2017). The study also shows that healthy lifestyles and health attitudes do not mediate the relationship between subjective norms and healthy behavioural outcomes, suggesting that subjective norms independently influence behavioural intentions.

Furthermore, the findings support previous studies that report consumers who maintain healthy lifestyles have a positive attitude towards healthy living and tend to engage in health-promoting behaviours (Blake et al., 2017; Chen, 2009; Pickard et al., 2018; Schwarzer, 2008). The study shows that individuals with strong, healthy lifestyles and habits are more likely to engage in activities such as physical exercise, joining a gym, and eating healthily (Chen et al., 2011; Psouni et al., 2016). Significantly, healthy lifestyles effectively mediated the relationship between healthy self-identity and healthy behaviour outcomes. The forgone discussions suggest that South Africans with strong health identities should be encouraged to improve their healthy lifestyles to achieve positive health outcomes such as physical activity. The mediation role of a healthy lifestyle also means individuals identifying with healthy behaviours ought to practicalise it to achieve the intended results (Chen, 2009).

Health attitudes, however, did not directly explain behavioural outcomes. Instead, the route from healthy lifestyles to behavioural outcomes was positive and significant. While attitudes are evaluative and domain-specific (Ajzen & Fishbein, 2005), lifestyles are habitual, describing the patterns of actions, their rationale, and what those actions constitute for those enacting them (Chen, 2011; Dean et al., 2016; Mai & Hoffmann, 2015). Thus,

strategies promoting healthy living should focus more on encouraging positive, healthy lifestyles than attitude formation.

5.2. Practical implications

The findings of this study offer practical implications for social marketers and brand managers who rely on healthy consciousness and healthy lifestyles as key differentiators. The study will enable them to understand the factors and underlying mechanisms impacting consumers' healthy consumption choices.

As predicted, health self-identity and self-efficacy beliefs strongly contribute to a healthy lifestyle among South African consumers. Thus, social marketers should evoke healthy self-identity to encourage the public to maintain healthy lifestyles and health-promoting habits. They should provide avenues for people to construct the health identity they desire to align with their healthy lifestyles effectively. Brand managers should also use health identity cues to position their brands to attract consumers seeking healthy lifestyles. Message appeals should contain "I can do it" affirmations to evoke perceived self-efficacy beliefs that can benefit healthy lifestyles.

Although previous studies confirm that subjective norms influence people's healthy lifestyles due to pressure to conform and avenues to observe others perform similar behaviour; this study does not support such prediction. Many brand communications portray individuals in groups and enact health-promoting behaviours such as exercising, eating healthy, following a natural diet, and attending gyms. This study, however, encourages social marketers and brand managers to focus more on personal factors, i.e. self-identity and self-efficacy beliefs, to achieve the greatest outcome in promoting healthy lifestyles. Furthermore, a healthy lifestyle is an important mechanism for stimulating health-promoting behaviour. Health self-identity can influence consumers' positive behavioural intentions for healthy living. Therefore, social marketers and brand managers should make healthy lifestyle promotions a vital element of any strategy that aims to develop and maintain health-promoting behaviours.

Regarding promotions, word-of-mouth communications may be an effective tool for social marketers to encourage healthy attitudes and actions (Rana & Paul, 2017). However, opinion leaders and reference groups should promote healthy behaviours such as physical exercise, a natural diet, and joining a gym. Recommendations from significant others and effective reference groups are highly influential, especially for people struggling to follow a healthy living regime and wanting a nudge.

Social organisations and brands that position themselves as promoters of a healthy lifestyle have enormous implications for behaviour change. This strategy will help them promote positive health attitudes and healthy behavioural intentions. Marketing communications should highlight how such brands promote healthy lifestyles since they significantly contribute to favourable health attitudes and health-promoting behaviours. Policymakers must develop particular interventions in South Africa to encourage healthy lifestyles. Interventions may include billboards and social media ads showcasing information about maintaining healthy lifestyles and potentially improving health attitudes and healthy behavioural choices. Such interventions may promote campaigns where people's health or green self-identity are stressed as routes to practice healthy lifestyles (Paul et al., 2016).

6. Limitations and direction for future research

The study highlights the following limitations for consideration in future research. First, this study conceptualises the behavioural intentions of healthy living, broadly regarding the future use of wearable watches, gym membership, and physical activity. The above observation departs from the preponderance of research findings on organic food consumption. However, future studies should consider the various domains of expression of healthy living, including recycling, functional food consumption, green-certified foods, natural diet adherence, etc., to ascertain differences in healthy lifestyle choices. Second, a comparative that focuses on differences between young and older people regarding their health self-identity, healthy lifestyles, susceptibility to reference group influences, and how they intend to affect their behavioural health intentions will be a valuable addition to the literature. Motivations to engage in healthy lifestyles may differ from older consumers. As a result, a multigroup analysis of these cohorts should help us go forward with research and methods for reaching these consumer cohorts.

Third, there is a lack of consensus on the role of subjective norms in accounting for many behavioural outcomes (e.g. Smith, 2015). Thus, future studies should consider the relationship between subjective norms and the cultural context (e.g. low vs. high cultural contexts) and how they condition healthy lifestyles and behavioural outcomes—focusing on different norms (e.g. prescriptive, descriptive, pragmatic). Also, studies in conjunction with national cultures may be more salient than relying on generalised subjective norms alone (Smith, 2015). Fourth, this study further recommends that future research consider identity construction more broadly to include personal and social identities in health self-conception (e.g. Brenner et al., 2018).

Finally, online data collection through convenience sampling helped test our hypotheses which has implications for the generalisation of the findings. Secondary data such as recorded healthy lifestyles and self-reporting opinions and attitudes is an important research avenue to gauge links between intentions and actual health behaviours.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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