FACTORS INFLUENCING A HEALTHIER FAST FOOD CHOICE INTENTION AFTER THE PROVISION OF ENERGY AND EXTENDED NUTRITIONAL INFORMATION AMONG WORKING YOUNG ADULTS IN THE CITY OF CAPE TOWN, SOUTH AFRICA

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ABSTRACT

The study aimed to determine the factors influencing a healthier fast food choice intention after the provision of nutritional information (energy only and energy, total fat, saturated fat and cholesterol) among adults aged 20 to 34 years old and employed in Cape Town. By way of a self-reported questionnaire, a survey was conducted using snowball sampling, to determine whether the provision of the nutritional information would influence the intended choice of a beef burger; which nutritional information would do so, and whether any significant factors (demographic, biographic and lifestyle characteristics, eating practices and fast food consumption) influenced the change in respondent choice intention toward a healthier fast food item. The 39 questions collected data on the respondent fast food consumption, intended beef burger choice before and after the provision of the nutritional information, and the respondent demographic, biographic and lifestyle characteristics. A little more than half (52,2%) of the 157 respondents reported that their intended beef burger choice would be influenced by the provision of nutritional information, with energy and extended nutritional information provision both found to positively support the healthier fast food choice intention among the respondents. Twelve respondent attributes were found to significantly ($p < 0,05$) influence the intended choice based on the nutritional information provision, with health-consciousness being the overall consolidating factor to influence the intended choice to a healthier option.

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INTRODUCTION

Since the 1950s, total food expenditure has steadily increased, with the proportion of food away from home (FAFH) expenditures steeply increasing since 2010 (United States Department of Agriculture [USDA], 2019). Over the past decade, the FAFH fast food category has become increasingly popular, both internationally (Anderson *et al*, 2011; Bezerra *et al*, 2012; Chen *et al*, 2015; Dingman *et al*, 2014; Euromonitor International, 2015; Lachat *et al*, 2012; Larson *et al*, 2011; Lin & Guthrie, 2012; National Restaurant Association, 2017; Statista, 2017; Todd *et al*, 2010), and in South Africa (SA) (Feeley *et al*, 2011; Steyn & Labadarios, 2011; Steyn *et al*, 2011; Van Zyl *et al*, 2010), with more people relying on FAFH to feed themselves and their families (Bezerra *et al*, 2012; Dumanovsky *et al*, 2011; Lin & Guthrie, 2012). The well-known convenience provided by fast food continues to be a major appealing factor contributing towards its increased consumption (Loureiro & Rahmani, 2016; Moss,

2013; Rudelt *et al*, 2013; Zagorsky & Smith, 2017). Studies show this to be especially true among young adults (Anderson *et al*, 2011; Dominguez *et al*, 2014; Fryar & Ervin, 2013; Lachat *et al*, 2012; Smith *et al*, 2013; Steyn *et al,* 2012) and more so, among working young adults, where working hours are increased and thus the desire for convenience and resulting fast food consumption frequency is consequently increased (Zagorsky & Smith, 2017).

In addition to convenience being a major driver for fast food consumption, consumers are attracted to the taste of fast food which is commonly high in levels of fat, sugar and salt (Moss, 2013; Rudelt *et al*, 2013). The presence of these ingredients contributes towards fast food subsequently being high in energy and sodium, and low in nutritional value – in consequence, rendering them 'unhealthy' (Lin & Guthrie, 2012; Todd *et al*, 2010; Vaccaro *et al*, 2018). With most countries adopting more "Westernised" diets (a diet characterised by high intakes of energy, fat, saturated fat, refined sugars [Oddy *et al,* 2013:779], salt [Myles, 2014], and low intakes of fruit and vegetables [Ayranci *et al,* 2010:775]), the modern diet is suggestively characterised as comprising an over-abundance of energy-dense foods (Janssen *et al*, 2018). Thus, fast food remains in the spotlight for its association with the "Westernised" and modern diet, poor dietary quality (Fulkerson, 2018; Larson *et al*, 2011; Todd *et al*, 2010), overweight and obesity (Chen *et al*, 2012; Feeley *et al*, 2011; Fulkerson, 2018; Larson *et al*, 2011; Todd *et al*, 2010), as well as insulin resistance and Type 2 diabetes mellitus (Kahr *et al*, 2016; Krishnan *et al*, 2010).

A decade ago, interventions to assist young adults who were habitual consumers of fast food to choose healthier options were in demand (Todd *et al*, 2010), after Bowman and Vinyard (2004) confirmed that the consumption of FAFH, and specifically fast food, is considered an important public health concern. In addition, Larson *et al* (2011) reported a need for messages to be disseminated that are associated with healthy eating behaviours as well as the public to be made aware of the consequences of the over-use of fast food outlets; particularly those serving foods contributing to high fat and sodium intake, thus, primarily those serving burgers and French fries ('chips') or sandwiches/subs. Today, together with immense funds and advertising and marketing strategies (e.g. the common "supersizing" phenomenon [Zlatevska *et al*, 2014]), the global fast food industry now grosses more than five hundred and seventy billion United States (US) dollars – a value greater than most countries' economic values (Statista, 2017). As a seemingly unstoppable force, the fast food industry continues to be a major obstacle in adopting a healthier lifestyle and according to Fulkerson (2018:2), "thwarts our best efforts to meet health goals".

To address the fast food industry growth and consumption concerns, the US Food and Drug Administration (2016) legislated the mandatory display of energy information at chain restaurants (20 or more locations) and similar retail food outlets (effective December 1st 2016, with the final compliance date for the rule May 7th 2018), with consumer access to further written nutritional information available upon request. Traditionally, it has not been mandatory to display this information. In SA, nutritional information provision on a food product is only mandatory when a health claim is made for the product (Department of Health, 2010). According to Maumbe (2012:147), "SA has one of the fastest growing fast food industries in the world", attributed mainly to an increase in household income. In spite of this, to date, very little has been published around the consumption of fast food in SA, with the majority of the literature concentrated around the consumption of street foods (Feeley *et al*, 2009; Feeley *et al*, 2011; Steyn *et al*, 2011). This is concerning, given the negative impacts of fast food consumption, and its subsequent negative association with obesity and diabetes mellitus; both of which remain significant health concerns gripping African countries, including SA (Kengne *et al*, 2013).

With the rising rates of obesity, the display of food energy content at fast food outlets has been suggested as a solution to promoting healthier diets (Dumanovsky *et al*, 2011; Volkova & Mhurchu, 2015), the primary objective being to inform consumers of the energy content of fast food items to potentially facilitate healthier menu choices (Bruemmer *et al*, 2012). Earlier research theorised that if consumers were informed of the energy content at fast food outlets, they may be encouraged to make healthier food choices, suggesting that consumers have limited knowledge of the energy content of fast food items (Cohen & Bhatia, 2012). To test this theory, subsequent research, mainly through simulation studies based on hypothetical menu choices, measured the intention of consumers to make healthier food choices at restaurants when provided with the relevant nutritional information (mainly energy provision). The research yielded mixed results. That is, where in part the research showed the provision of nutritional information to improve the hypothetical selections of items lower in energy (Avcibasioglu *et al*, 2011; Bollinger *et al*, 2011; Brissette *et al*, 2013;

Dowray *et al*, 2013; Dumanovsky *et al*, 2011; Ellison *et al*, 2013; Krieger *et al*, 2013; Martinez *et al*, 2012; Morley *et al*, 2013; Pulos & Leng, 2010; Roberto *et al*, 2010; Wisdom *et al*, 2010), other studies (Downs *et al*, 2013; Elbel *et al*, 2009; Elbel *et al*, 2011; Finkelstein *et al*, 2011; Swartz *et al*, 2011; Tandon *et al*, 2011) proved the provision to have no significant effect at all. A recent study by Loureiro and Rahmani (2016) measured the hypothetical *versus* the actual choice of fast food items among consumers in the presence of energy labelling. The study disproved the positive influence of calorie information at the point of sale and evidenced that consumers did not change their choice at the fast food outlets even after indicating a positive intent to hypothetically change their choice. This clear disconnect between stated preference (intention) and actual choice (behaviour) supported earlier work by Webb and Sheeran (2006), showing that even when a medium to large change in intended choice was indicated, that only a small to medium change in actual behaviour was registered.

The topic of the associated intention-behaviour gap has been researched widely with the outcomes indicating that consumers do not show behaviour to be reflective of their stated intentions (Webb & Sheeran, 2006). De Ridder (2017) later found that while many people show positive intention to change their diets (especially when motivated by weight loss ambitions), they still fail to maintain these stated intentions to change their consumption patterns – the key aspect consistent with inhibiting changing eating behaviour, being habit. On the other hand, the ultimate support factor in closing the intention-behaviour gap was identified as behavioural intention.

Beyond the intention to positively influence consumers to make healthier fast food choices when presented with energy information at fast food outlets, a secondary objective hypothesised that the display of the information may encourage the fast food industry to improve their menu items. Some mitigation proposals proposed by Bruemmer *et al,* (2012) include: the removal of unhealthy menu items, offering smaller portion sizes, and reducing overall energy content provided across the fast food outlets. Despite this attempt, across five fast food chain outlets in Australia, the introduction and display of nutritional information proved no positive impact in influencing these outlets to reformulate their offerings to be lower in energy content (Wellard-Cole *et al*, 2017).

In spite of the abovementioned international research, to the researchers' knowledge, no research has been conducted in SA on the influence of nutritional information provision on the choice of a fast food among consumers. To address this paucity, the present research investigated the hypothetical (intended) choice of a (healthier) (represented as being lower in energy, total fat, saturated fat and cholesterol content) fast food item (represented in this study as a beef burger) among young adult fast food consumers, and the factors influencing the intended healthier choice, with the provision of energy and extended nutritional (represented in this study as energy, total fat, saturated fat and cholesterol) information.

METHODOLOGY

Sample selection

Purposive sampling, by way of snowball sampling, was used to recruit (i) adults between the ages of 20 and 34 years, (ii) who were consumers of fast food and specifically beef burgers, and (iii) who were employed in Cape Town within the professional and clerical occupational classifications. For the sampling criteria, young adults were firstly selected, as this age group is associated with the highest fast food consumption frequency among all age groups (Anderson *et al*, 2011; Dominguez *et al*, 2014; Fryar & Ervin, 2013; Lachat *et al*, 2012; Smith *et al*, 2013; Steyn *et al*, 2012). Fryar and Ervin (2013) found a peak in fast food consumption after the age of 20 years. Conversely, on a local level, Steyn *et al,* (2012) found the frequency of fast food consumption to start declining after the age of 34 years. A higher proportion of individuals below 34 years old reported consumption of fast food more than twice per week than those individuals over this threshold (15,7% vs. 10,3%) in their study. When considering the young adult population distribution within the City of Cape Town (see below), and employed within the selected major occupational classifications (as professionals, technicians and associate professionals, and clerks), the age groups were split into 20-24 years, 25-29 years and 30-34 years. Thus, the young adults in the current study were purposively sampled within this age threshold to realistically obtain a sample of employed young adults to represent the overall population within this demographic.

To strengthen the findings of the study, the respondents were also required to be consumers of fast food, and specifically, consumers of beef burgers, to collect appropriate data pertaining to: the participant fast food consumption (behaviours, preferences,

factors influencing consumption, consumption patterns, healthier food intentions and self-reported interest and knowledge in the topic of food, nutrition and health); the participant fast food choice intention (using a beef burger as the exploratory item) with the provision of nutritional information (when provided with energy, and energy, fat and cholesterol content); and the corresponding participant demographic, biographic and lifestyle information.

Employed individuals were further targeted. Individuals with higher levels of education (Brissette *et al*, 2013; Cheah *et al*, 2015; Chen *et al*, 2012), employed (Cheah *et al*, 2015), and who have higher income levels (Cheah *et al*, 2015; Chen *et al*, 2012) have been shown to be most likely to read nutritional information. It was important for the present study to identify whether consumers who are already at a predisposition to notice and read nutritional information, would potentially make use of the nutritional information to show intention of a healthier choice of fast food.

The occupational classifications delineated and used for the study, according to the International Standard Classification of Occupations (ISCO-88) for major, minor and unit groups, were the major occupational classifications as professionals (group 2), technicians and associate professionals (group 3) and clerks (group 4) (ILO, 1996-2013) (representing the professional and clerical occupational classifications as consumer group in the study). The major occupation classification group as legislators, senior officials and managers (group 1) (ILO, 1996-2013) was not included, as it was assumed that these individuals would be difficult to gain access to, and would more likely be over the age of 34 years.

Given the major occupational classifications of the employed population in Cape Town, approximately 34% were classified as professionals (85 815 persons, or 9,1%), technicians and associate professionals (100 641 persons, or 10,7%) and clerks (131 482 persons, or 14%). With a population of 1 112 850 young adults between the ages of 20 and 34 years (20-24, 25-29 and 30-34 age groups) in the City of Cape Town (Statistics South Africa, 2013), an average distribution of 34% was calculated across these three major occupational classifications detailed above, which provided an estimated population of 378 369 employed within these three groups, from which a minimum sample size of 150 respondents was calculated. The sample calculation used is as follows:

$$n = \frac{Z^2\, p\, q\, N}{e^2\,(N-1) + Z^2\, p\, q}$$

Where: p (probability of success) = 0,5; q (probability of failure) = 0,5; Z (z-value for 95% confidence interval) = 1,96; e (precision) = 0,08; N (population size) = 378 369.

Questionnaire

A survey was conducted, using a self-administered 15-page questionnaire that comprised 39 multiple-choice questions, distributed as three major sections (A, B and C). The questionnaire aimed to obtain self-reported information on: (A) respondent fast food consumption (13 questions), (B) respondent fast food consumption intended choice after nutritional information provision using a beef burger as the fast food exploratory item (12 questions), as well as (C) respondent demographic, biographic and lifestyle information (14 questions).

The questionnaire was self-developed by the researchers and subsequently validated by an expert panel consisting of higher education lecturers at the Cape Peninsula University of Technology (CPUT) in the Programme Consumer Science: Food and Nutrition, and qualified experts employed in the field of food and food science and nutrition (n = 5). The expert panel was utilised to support the questionnaire content- and face-related evidence of validity. The reliability of the questionnaire was not addressed due to the varied nature of the questionnaire constructs, the limited number of questions related to a specific trait in a construct and the different number of response categories to questions delineating the same trait and construct. The questionnaire took approximately 15 – 20 minutes to complete (due to its multiple-choice functionality) and was distributed according to each respondent's preference for ease of use (i.e. printed copy or electronic version). Marsh *et al,* (2014) found no significant differences between using paper and electronic versions of the same questionnaire, with the data gathered from these administrations consistently yielding equivalent results.

Selection of beef burger as fast food exploratory item

As the growth of the fast food industry is dominated by burgers (Smith *et al*, 2013; Van Zyl *et al*, 2010), with beef burgers predicted to experience the strongest growth (21%) among the fast food categories in 2019 (Euromonitor International, 2015), the latter was chosen as the exploratory item for the present study. Beef

burgers furthermore, provided an opportunity for ingredient and nutritional content manipulation. That is, realistic commercial beef burgers found in fast food establishments could be constructed with ingredient manipulations (e.g. cheese burger, cheese and bacon burger) for the purpose of the questionnaire, to represent a menu showcasing the 'healthiest' (lowest nutritional content) to the 'unhealthiest' (highest nutritional content) beef burger item for selection. As a result, section B of the questionnaire obtained information from the respondents pertaining to their beef burger intended choice (before and after the provision of nutritional information), and the factors influencing the intended choice in each instance.

The section began by asking respondents, out of a choice of two types of burgers, whether they would choose a 'regular beef burger (defined at the beginning of the section as "one white bread roll with one beef patty, sauce of your choice, lettuce, tomato (1 slice), fried onions (1 tablespoon) and gherkins (2 slices)") with additions (extra items)', or a 'regular beef burger with no additions (no extra items)' (Question B1); followed by which addition(s) they would choose (where chosen) from the addition list: 'cheese', 'fried egg', 'bacon rasher' or an 'extra beef patty' (Question B2). These typical additions to beef burgers were identified as high constituents of energy, total fat, saturated fat and/or cholesterol, and were chosen as the representative ingredients contributing the 'added' nutritional value for each burger item combination to be presented in the 'menu choice' section of the questionnaire, displaying energy content, and then the extended nutritional information provision. The last section (section C) to follow, gathered information on the respondent demographic, biographic and lifestyle information.

Beef burger ingredients and ingredient weights

The study focused on four major leading fast food franchises, as per FASA (Franchise Association of South Africa, n.d.) located within Cape Town, and competitive in the beef burger category. Information pertaining to the burger ingredients and corresponding weights were obtained through the purchasing of various commercial beef burger types (n = 28) across these franchises. At each franchise, a burger was purchased where at least one of the additions above was present in the combination (e.g. cheese burger; cheese and bacon burger; cheese, bacon and egg burger).

The beef burger purchasing occurred over approximately six months. Burgers were dissected one by one, with each ingredient weighed twice (in g) using a RADWAG PS 4500/ C/1 electronic, two decimal scale, and documented with Microsoft® Excel®, 2011 to obtain an average ingredient weight (portion size) across the burger franchises. If a difference in weight was found in the second weighing, the specific ingredient was then weighed again and the mean value obtained from the three results documented, ensuring precision and eliminating human error. In addition to this, each beef burger was purchased twice for purposes of standardisation.

Beef burger nutritional information calculations

To calculate the nutritional content to be displayed as nutritional information provision in the menu choice section, the nutritional content per 100 g ingredient was first documented using the Medical Research Council (MRC) FoodFinder 3.0 (FF3) Dietary Analysis Software Program, 2002 (FoodFinder3 Dietary Analysis Software and Program, 2002) and via the Microsoft® Excel®, 2011 software. The nutritional content was then calculated according to the determined average portion size established through the ingredient weighing exercise. The researchers then combined the additions with a 'regular beef burger' to compile a representative beef burger menu consisting of 16 beef burger combinations, providing nutritional information in ascending order (ranked according to the energy and total fat content) from the 'healthiest' (lowest nutritional content) to the 'unhealthiest' (highest nutritional content) beef burger item (see Table 1).

Permission to conduct the main study

Following the approval of the study by the CPUT Faculty of Applied Sciences Research Committee, the Faculty Research Ethics Committee granted ethics approval (Ref. 10/2012). A respondent information leaflet and consent form was provided to each prospective respondent, assuring confidentiality. All the respondents participated voluntarily and anonymously and were issued with this consent form to verify their participation, but with an added proviso that they could withdraw from the study at any time.

Pre-testing of the questionnaire

The questionnaire was pre-tested on 15 young adults (approximately 10% of the main study sample) who were approached in the same manner, and based on the same inclusion

TABLE 1: NUTRITIONAL CONTENT (ENERGY, TOTAL FAT, SATURATED FAT AND CHOLESTEROL) PER PROVIDED BEEF BURGER OPTION

Beef burger option	Nutrient content per beef burger option[b]			
	Energy (Kilojoule)	Total fat (gram)	Saturated fat (gram)	Cholesterol (milligram)
Regular beef burger[a]	1 879,15	19,84	6,93	78,70
Regular beef burger with cheese	2 154,46	25,27	10,36	95,81
Regular beef burger with fried egg	2 172,90	25,46	8,27	232,32
Regular beef burger with bacon rasher	2 631,53	35,66	12,54	106,04
Regular beef burger with cheese & fried egg	2 448,21	30,89	11,69	249,42
Regular beef burger with cheese & bacon rasher	2 906,84	41,10	15,96	123,15
Regular beef burger with fried egg & bacon rasher	2 925,28	41,28	13,87	259,66
Regular beef burger with cheese, fried egg & bacon rasher	3 200,59	46,72	17,30	276,76
Regular beef burger with extra beef patty	2 818,87	36,00	13,27	155,85
Regular beef burger with extra beef patty & cheese	3 094,18	41,44	16,69	172,95
Regular beef burger with extra beef patty & fried egg	3 112,62	41,62	14,61	309,46
Regular beef burger with extra beef patty & bacon rasher	3 571,24	51,83	18,87	183,19
Regular beef burger with extra beef patty, cheese & fried egg	3 387,93	47,06	18,03	326,57
Regular beef burger with extra beef patty, cheese & bacon rasher	3 846,55	57,26	22,30	200,30
Regular beef burger with extra beef patty, fried egg & bacon rasher	3 865,00	57,45	20,21	336,80
Regular beef burger with extra beef patty, cheese, fried egg & bacon rasher	4 140,31	62,88	23,63	353,91

[a] A 'regular' or 'standard' beef burger as one white bread roll (71 g), one beef patty (82 g), a sauce of choice (9 g), one leaf of lettuce (11 g), one medium tomato slice (18 g), one level household tablespoon of fried onion (8 g) and two medium gherkin slices (5 g) to which the nutritional contributions pertaining to each respective ingredient addition was then added.
[b] To calculate the nutritional information per beef burger ingredient, and ultimately, per compiled beef burger of choice, the nutritional information per beef burger ingredient according to the approximate portion size was established. The nutritional values were documented using the Medical Research Council (MRC) FoodFinder 3,0 (FF3) Dietary Analysis Software Program, 2002 (FoodFinder3 Dietary Analysis Software and Program, 2002).

criteria as required for the main study according to the three main filter questions: (i) aged between 20 and 34 years (demographic), (ii) consumers of beef burgers (eating practice), and (iii) working within the professionals, technicians and associate professionals and/or clerks major occupational classifications sector (demographic) of Cape Town, SA. In addition, the questionnaire was administered in exactly the same way that it was going to be administered in the main study (n = 8 printed and n = 7 electronic), according to the respondents' preference, and provided by the researchers according to this preference.
Respondents were briefed to provide feedback on whether any problems or issues had been encountered during the questionnaire completion, after which, the questionnaire would be adjusted accordingly. None of the questions was found to be too difficult or ambiguous and thus questions were rather adapted (vs. being discarded) where applicable, according to the respondent suggestions of: (i) word emphasis, (ii) continuity, (iii) clarity, (iv) sentence/response word discards, (v) sentence/response word additions and (vi) formatting.

Data collection

The data collection, utilising snowball sampling, occurred over a period of seven months in 2014, ending in October. To recruit the respondents, the principal researcher identified and approached 72 primary contacts (via either physical contact and/or social media) working across small- to medium-sized companies located in Cape Town, to provide for a broader coverage of participating individuals within the City of Cape Town boundaries (vs. through larger company employee invitation). Primary contacts were identified as either fitting the requirements to form part of the study (i.e. met inclusion criteria), to form a primary network (direct linkages), and/or who could possibly be considered a 'recruiter' of additional respondents (through either their working circles or friendships) to form a secondary network (indirect linkages).

At this first information stage of the snowball sampling, convenience sampling was used to approach primary contacts of the principal researcher, to inform them of the study (brief introduction), the number of respondents

required (minimum 150), and the demographic and eating practice respondent inclusion criteria. In this preliminary phase, contacts were only informed. If willing to participate, they needed to indicate whether they would do so as a recruiter or a respondent, or recruiter and respondent (dual), and were then requested to indicate an approximate number of secondary contacts accessible to them for distribution of the questionnaire.

Of the 72 contacts approached, 15 (20,8%) contacts did not respond, leaving 57 (79,2%) contacts that agreed to participate. Of these contacts, 21 (36,8%) later withdrew, leaving a pool of 36 primary contacts. Of these, half (50%, n = 18) were able to fulfil a recruiter role, with two-thirds (61,1%, n = 11) of this group able to fulfil a dual-role. The remaining one-third (28,9%, n = 7) were able to fulfil only the role as recruiter as they either did not fulfil the criteria (21,1%, n = 4), or previously had assisted in the questionnaire pre-testing (15,8%, n = 3). The remaining half (n = 18) of these primary contacts then fulfilled a respondent role only, contributing towards the researchers' network (primary linkage) which, in addition to the individuals who contributed a dual-role (n = 11), formed a total network of 29 individuals as respondents. Thus, the final sample entailed 19 networks, of which one was through direct linkage to the researcher (primary network), and the remaining 18 as secondary networks (indirect linkages) contributed by the recruiters. These indirect linkages contributing towards the secondary network spanned from as low as one individual – where the recruiter could only find one respondent to fit the study criteria and complete the questionnaire – to as high as 29 individuals as respondents.

Data analysis

The numerically-coded questionnaire response data was entered into the IBM© SPSS© Statistics Versions 21 and 22 software program, through which the statistical analysis took place. Descriptive statistics, in the form of frequency tables, was applied for the analysis. Via the Pearson's chi-squared analysis, contingency tables were utilised to compare the data obtained from the respondent group to determine associations/differences (at a significance level of $p < 0,05$) between the respondents who, after the provision of nutritional information, would and would not show intention to change their beef burger choice, and their self-reported (i) fast food and beef burger consumption behaviours, (ii) eating practices, and (iii) demographic, biographic and lifestyle information (predictor variables). Response options were combined wherever possible to avoid response categories that would have a very low cell count within the data analysis. The Fisher's exact test was utilised in the above analysis to compare data where two-by-two (2 x 2) tables represented the data provision.

Of the factors found within the above predictor variables, it was anticipated that some of these factors would have a larger influence than others. Thus, logistic regression (as a categorical-data regression method at a 0,05 significance level) was carried out to determine the contribution of the significant factors, via the Pearson's chi-squared and Fisher's exact analyses, to substantially influence the respondents to change their intended beef burger choice based on the information provision. In logistic regression, the outcome or dependent variable is binary, which in this study, formed the respondent change or not in intended beef burger choice after the information provision, with the explanatory or independent variables as self-reported (i) fast food and beef burger consumption behaviours, (ii) eating practices, and (iii) demographic, biographic and lifestyle information. The Wald chi-square statistic was applied to determine the contribution or significance of each predictor variable.

RESULTS

Of the 304 questionnaires distributed, 163 respondents completed the questionnaire (53,6% response rate), of which six questionnaires (3,7%) were discarded due to unsuitability. One hundred and fifty seven young adults, aged between 20 and 34 years, and employed in the professional and clerical occupational groups in Cape Town, SA, remained, constituting the final respondent sample.

Slightly more than half (56,1%) of the respondents were female, with approximately three-quarters (75,5%) of the respondents representing living circumstances as 'away from home' (i.e. either with a partner [27,1%], with a partner and/or with children [17,4% and 3,2%, respectively], on their own [17,5%], with roommates [9%] or with family [1,3%]). The remaining quarter (24,5%) of these working young adults lived 'at home', residing with their parents.

Respondents influenced in their beef burger choice after the energy and extended nutritional information provision

Slightly more than half (52,2%) of the

TABLE 2: THE RESPONDENTS' INTENDED BEEF BURGER CHOICE WHEN PRESENTED WITH NUTRITIONAL INFORMATION OF EACH BEEF BURGER OPTION IN TWO NUTRITIONAL INFORMATION PROVISION FORMATS

Respondent intended beef burger choice when presented with the nutritional information provision per beef burger option (n = 82)	Two nutritional information provision formats			
	Intended item choice when presented with energy content per burger		Intended item choice when presented with energy, total fat, saturated fat and cholesterol content per burger	
	%	n	%	n
Regular beef burger	45,1	37	61,0	50
Regular beef burger with cheese	35,5	29	20,7	17
Regular beef burger with fried egg	0,0	0	2,4	2
Regular beef burger with bacon rasher	2,4	2	2,4	2
Regular beef burger with cheese and fried egg	0,0	0	0,0	0
Regular beef burger with cheese & bacon	5,0	4	6,2	5
Regular beef burger with fried egg & bacon	1,2	1	1,2	1
Regular beef burger with cheese, fried egg & bacon	0,0	0	1,2	1
Regular beef burger with extra beef patty	0,0	0	0,0	0
Regular beef burger with extra beef patty & cheese	2,4	2	3,7	3
Regular beef burger with extra beef patty & fried egg	1,2	1	1,2	1
Regular beef burger with extra beef patty & bacon	0,0	0	0,0	0
Regular beef burger with extra beef patty, cheese & fried egg	2,4	2	0,0	0
Regular beef burger with extra beef patty, cheese & bacon	1,2	1	0,0	0
Regular beef burger with extra beef patty, fried egg & bacon	1,2	1	0,0	0
Regular beef burger with extra beef patty, cheese, fried egg & bacon	2,4	2	0,0	0

respondents indicated that they would be influenced by the provision of nutritional information in their beef burger choice. Table 2 presents the intended choice made by these respondents (n = 82) when they were presented with 16 beef burger items, with the two nutritional information provision formats: firstly, showing only the energy content and secondly, showing the energy, total fat, saturated fat and cholesterol content (extended nutritional information).

When presented with the energy content alone, nearly half (45,1%) of the respondents chose a 'regular beef burger' (lowest energy content among the 16 burger alternatives). The majority (80,6%) also chose the beef burger item with the lowest energy content (i.e. 'regular beef burger', and 'regular beef burger with cheese') among the beef burger items. When presented with the extended nutritional information, a similar proportion (81,7%) *versus* the first format (80,6%) still chose the two beef burger items with the lowest nutritional contributions (i.e. a 'regular beef burger' and 'regular beef burger with cheese'). The proportion of respondents then selecting a 'regular beef burger', however, increased by approximately 16%, and the proportion selecting a 'regular beef burger with cheese' decreased by 14,8%. In addition, the proportion of respondents choosing the beef burger items with the highest nutritional contributions in the first format provision became zero for those beef burger selections in the second format provision (see last four items in Table 2).

Factors influencing the respondent beef burger choice after the provision of nutritional information

The factors found to influence the nutritional information provision on the respondents' beef burger choice are reported in the sections to follow.

Respondent demographic, biographic and lifestyle characteristics: Respondents were not significantly ($p > 0,05$) influenced by their gender and living circumstance (as demographic characteristics), or their own perceived body weight status, alcohol consumption, level of physical activity, or own perceived knowledge of the topic of 'food, nutrition and health' compared to other young adults (as biographic and lifestyle characteristics) respectively, in their beef burger

TABLE 3: ASSOCIATION BETWEEN THE INFLUENCE OF THE NUTRITIONAL INFORMATION PROVISION ON THE RESPONDENTS' INTENDED BEEF BURGER CHOICE AND THE RESPONDENT BIOGRAPHIC AND LIFESTYLE CHARACTERISTICS

Respondent demographic, biographic and lifestyle characteristics		Respondent percentage and number		Influence of nutritional information provision on Intended beef burger choice				Significance ($p < 0,05$)[a,b]
				Yes		No		
		%	n	%	n	%	n	
Gender	Male	43,9	69	39,0	32	49,3	37	0,203[a]
	Female	56,1	88	61,0	50	50,7	38	
	Total	100,0	157	100,0	82	100,0	75	
Living circumstance[d]	With parents	24,5	38	26,3	21	23,3	17	0,467[b]
	With roommates	9,0	14	8,8	7	9,6	7	
	With partner	27,1	42	31,2	25	23,3	17	
	With partner and children/or children/or family[c]	36,2	56	21,2	17	20,5	15	
	On own	17,4	27	12,5	10	23,3	17	
	Total	100,0	153	100,0	80	100,0	73	
Own perceived body weight status[e]	Underweight	4,5	7	6,1	5	2,7	2	0,416[b]
	Optimal/Normal body weight	56,4	88	58,5	48	54,1	40	
	Slightly overweight/Overweight/Obese[c]	39,1	59	35,4	29	43,2	32	
	Total	100,0	156	100,0	82	100,0	74	
Alcohol consumption	***Consumption within past month***							
	Yes	75,8	119	72,0	59	80,0	60	0,267[a]
	No	24,2	38	28,0	23	20,0	15	
	Total	100,0	157	100,0	82	100,0	75	
	Number of consumption occasions during past month (n = 119)							
	1-2	24,4	29	25,4	15	23,3	14	0,111[b]
	3-5	38,7	46	47,4	28	30,0	18	
	6-9	13,4	16	11,9	7	15,0	9	
	>10[d]	23,5	28	15,3	9	31,7	19	
	Total	100,0	119	100,0	59	100,0	60	
	Binge drinking[f] occurrence (days) during the past month (n = 119)							
	0	43,7	52	54,2	32	33,3	20	0,115[b]
	1	16,0	19	15,3	9	16,7	10	
	2	10,1	12	8,5	5	11,7	7	
	>3[c]	30,2	36	22,0	13	38,3	23	
	Total	100,0	119	100,0	59	100,0	60	
Smoking status[g]	Non-smoker	53,5	84	69,5	57	36,0	27	0,000[b]
	Current smoker	29,3	46	15,9	13	44,0	33	
	Former smoker	17,2	27	14,6	12	20,0	15	
	Total	100,0	157	100,0	82	100,0	75	
Level of physical activity	Physically active[h]	64,3	101	69,5	57	58,7	44	0,183[a]
	Not physically active	35,7	56	30,5	25	41,3	31	
	Total	100,0	157	100,0	82	100,0	75	
Own perceived interest in the topic of 'food, nutrition and health'	Very interested (will regularly obtain/	31,8	50	40,2	33	22,7	17	0,025[a]
	Somewhat interested (will occasionally read/obtain information on the topic)/ Not interested (will not obtain/read information on the topic)[c]	68,2	197	59,8	49	77,3	58	
	Total	100,0	157	100,0	82	100,0	75	

TABLE 3: ASSOCIATION BETWEEN THE INFLUENCE OF THE NUTRITIONAL INFORMATION PROVISION ON THE RESPONDENTS' INTENDED BEEF BURGER CHOICE AND THE RESPONDENT BIOGRAPHIC AND LIFESTYLE CHARACTERISTICS (CONTINUED)

Respondent demographic, biographic and lifestyle characteristics		Respondent percentage and number		Influence of nutritional information provision on Intended beef burger choice				Significance ($p < 0,05$)[a,b]
				Yes		No		
		%	n	%	n	%	n	
Own perceived knowledge of the topic of 'food, nutrition and health' compared to other young adults[e]	Much or somewhat less than most[c]	16,5	26	11,0	9	22,7	17	0,147[b]
	About similar to most	38,9	61	40,2	33	37,3	28	
	Somewhat more than most	33,8	53	35,4	29	32,0	24	
	Much more than most	10,8	17	13,4	11	8,0	6	
	Total	100,0	157	100,0	82	100,0	75	

[a] Fisher's exact test.
[b] Pearson's chi-square.
[c] Response options combined due to low cell counts.
[d] n = 153 as respondent sample (2 missing respondent answers with 'yes', n = 80 and 'no', n = 73).
[e] n = 156 as respondent sample (1 missing respondent answer with 'yes', n = 81).
[f] Binge drinking was defined as "5 drinks of alcohol in a row, that is, within a couple of hours" (Naimi et al, 2010).
[g] Current smoker included those who smoked any tobacco in the past 12 months and those who had quit within the past year. Former smoker included those who had quit more than a year ago (Liu et al, 2011).
[h] Physically active was defined as "regular involvement in moderate exercise (walking, cycling or gardening) or strenuous exercise (jogging, football and vigorous swimming) for four hours or more a week" (Liu et al, 2011).

choice after the nutritional information provision (Table 3). The influence of the provision on the respondents' beef burger choice was significantly influenced by the respondents' smoking status ($p < 0,001$) and their own perceived interest in the topic of 'food, nutrition and health' ($p < 0,05$) as biographic and lifestyle characteristics. Most of the respondents who indicated that the provision would influence their choice, *versus* those who indicated that the provision would not influence their choice, were non-smokers (69,5% vs 36%). A larger proportion of the respondents who indicated that the provision would influence their choice, *versus* those who indicated that the provision would not influence their choice, also indicated that they were very interested in the topic of 'food, nutrition and health' (40,2% vs 22,7%).

Respondent eating practices: The influence of the nutritional information provision on the respondents' beef burger choice was not significantly ($p > 0,05$) influenced by their usual meal pattern over the weekend, but was significantly ($p < 0,05$) influenced by their usual meal pattern during the week, meals most often skipped (breakfast, lunch, dinner or no meal) during the week and over the weekend (Table 4). A significantly larger proportion of the respondents who indicated that the provision would influence their choice, *versus* those who indicated that the provision would not influence their choice, had a daily meal pattern during the week of three or more meals per day, plus snacks, or followed a daily snacking pattern (51,2% vs. 32%). They also did not skip meals during the week (48,1% vs. 22,7%) or on the weekend (25,9% vs. 12,2%) and, more specifically, skipped breakfast during the week (35,8% vs. 57,3%) and on the weekend (32,1% vs. 52,7%), compared to those respondents who indicated that the provision would not influence their choice.

Furthermore, while the influence of the nutritional information provision on the respondents' beef burger choice was not significantly ($p > 0,05$) influenced by their daily number of vegetable servings, the influence of the provision on the respondents' beef burger choice was significantly ($p < 0,05$) influenced by the respondents' own description of their dietary intake compared to that of other young adults of their own age, along with their daily fruit and vegetable intake, as well as daily fruit and wholegrain serving intakes (see Table 5). That is, most of the respondents who indicated that the provision would influence their choice, *versus* those who indicated that the provision would not influence their choice, described their own dietary intake as consuming types of foods and beverages considered healthier choices than those consumed by most young adults of their age (59,3% *vs.* 36,5%). In this respect, a larger proportion reported consumption of fruit and vegetables on most days (four or more days) per week (37,8% *vs.* 30,7%), or every day

TABLE 4: ASSOCIATION BETWEEN THE INFLUENCE OF THE NUTRITIONAL INFORMATION PROVISION ON THE RESPONDENTS' INTENDED BEEF BURGER CHOICE AND THE RESPONDENT MEAL PATTERN AS INDICATION OF THEIR EATING PRACTICES

Respondent meal pattern		Respondent percentage and number		Influence of nutritional information provision on intended beef burger choice				Significance ($p < 0,05$)[a]
				Yes		No		
		%	n	%	n	%	n	
Daily meal pattern during the week	One meal per day/one meal plus snacks[b]	8,9	14	4,9	4	13,3	10	0,035
	Two meals per day	10,2	16	6,1	5	14,7	11	
	Two meals per day plus snacks	22,3	35	19,5	16	25,3	19	
	Three meals per day	16,6	26	18,3	15	14,7	11	
	Three or more meals per day plus snacks/ only snacks[b]	42,0	66	51,2	42	32,0	24	
	Total	100,0	157	100,0	82	100,0	75	
Daily meal pattern during the weekend	One meal per day/one meal per day plus snacks[b]	11,4	18	11,0	9	12,0	9	0,839
	Two meals per day	15,9	25	13,4	11	18,7	14	
	Two meals per day plus snacks	40,8	64	40,2	33	41,3	31	
	Three meals per day	9,6	15	11,0	9	8,0	6	
	Three meals per day plus snacks/only snacks[b]	22,3	35	24,4	20	20,0	15	
	Total	100,0	157	100,0	82	100,0	75	
Meal most skipped during the week[c]	None/ no meal	35,9	56	48,1	39	22,7	17	0,004
	Breakfast	46,1	72	35,8	29	57,3	43	
	Lunch/ dinner[b]	18,0	28	16,1	13	20,0	15	
	Total	100,0	156	100,0	81	100,0	75	
Meal most skipped during the weekend[d]	None/ no meal	19,4	30	25,9	21	12,2	9	0,043
	Breakfast	41,9	65	32,1	26	52,7	39	
	Lunch	28,4	44	30,9	25	25,7	19	
	Dinner	10,3	16	11,1	9	9,4	7	
	Total	100,0	155	100,0	81	100,0	74	

[a] Pearson's chi-square.
[b] Response options combined due to low cell counts.
[c] n = 156 as respondent sample (1 missing respondent answer with 'yes', n = 81).
[d] n = 155 as respondent sample (2 missing respondent answers with 'yes', n = 81 and 'no', n = 74).

(34,2% *vs.* 17,3%), one or more daily servings of whole grains (82,9% *vs.* 66.2%) and two or more daily fruit servings (58,5% *vs.* 34,7%) (see Table 5).

Respondent fast food consumption: While the influence of the provision of nutritional information on the respondents' beef burger choice was not significantly ($p > 0,05$) influenced by when they usually consumed fast food, or with whom they usually consumed fast food, it was significantly ($p < 0,05$) influenced by how often they consumed fast food. That is, a larger proportion of the respondents who indicated that the provision would influence their choice *versus* those who indicated that the provision would not influence their choice, reported a fast food consumption frequency of less than once a month (26,8% *vs.* 13,3%). In contrast, a smaller proportion of these respondents reported a fast food consumption frequency of at least once a week (45,2% *vs.* 54.8%). None of the factors investigated to support and/or influence the respondent fast food consumption – that is, (i) time constraints, (ii) convenience, (iii) taste, (iv) price, (v) assumed nutritional content, (vi) availability, (vii) advertising/media messages, (viii) friends or (ix) family – influenced their beef burger choice on the provision ($p > 0,05$).

The influence of the provision on the respondents' beef burger choice was, however, significantly ($p < 0,05$) influenced by their beef burger choice without nutritional information; that is, a larger proportion of the respondents who indicated that the provision would influence their

TABLE 5: ASSOCIATION BETWEEN THE INFLUENCE OF THE NUTRITIONAL INFORMATION PROVISION ON THE RESPONDENTS' INTENDED BEEF BURGER CHOICE AND THE RESPONDENT OWN DIETARY INTAKE DESCRIPTION AND CONSUMPTION OF SOME FOODS AS INDICATION OF THEIR EATING PRACTICES

Respondent own dietary intake description and consumption of some foods		Respondent percentage and number		Influence of nutritional information provision on intended beef burger choice				Significance ($p < 0,05$)[a,b]
				Yes		No		
		%	n	%	n	%	n	
Own dietary intake description[d]	Consume types of foods/ beverages popular with and consumed by most young adults of own age	51,6	80	40,7	33	63,5	47	0,006[a]
	Consume types of foods/ beverages considered healthier choices than those consumed by most young adults of own age	48,4	75	59,3	48	36,5	27	
	Total	100,0	155	100,0	81	100,0	74	
Daily fruit and vegetable consumption	Never/ few days (3 days or less)[c]	39,5	62	28,0	23	52,0	39	0,005[b]
	Most days (4 days or more)	34,4	54	37,8	31	30,7	23	
	Every day	26,1	41	34,2	28	17,3	13	
	Total	100,0	157	100,0	82	100,0	75	
Number of daily fruit servings	None to 1	52,9	83	41,5	34	65,3	49	0,004[a]
	2 or more[c]	47,1	74	58,5	48	34,7	26	
	Total	100,0	157	100,0	82	100,0	75	
Number of daily vegetable servings	None to 1	35,7	56	32,9	27	38,7	29	0,637[b]
	2	47,1	74	47,6	39	46,7	35	
	3 or more[c]	17,2	27	19,5	16	14,6	11	
	Total	100,0	157	100,0	82	100,0	75	
Number of daily wholegrain servings[e]	None	25,0	39	17,1	14	33,8	25	0,044[b]
	1	45,5	71	52,4	43	37,8	28	
	2 or more[c]	29,5	46	30,5	25	28,4	21	
	Total	100,0	156	100,0	82	100,0	74	

[a] Fisher's exact test.
[b] Pearson's chi-square.
[c] Response options combined due to low cell counts.
[d] n = 155 as respondent sample (2 missing respondent answers with 'yes', n = 81 and 'no', n = 74).
[e] n = 156 as respondent sample (1 missing respondent answer with 'no', n = 74).

choice *versus* those who indicated that it would not, chose a regular beef burger without additions (no extra items) in the absence of the provision (37,8% *vs.* 18,7%) (see Table 6).

The influence of the nutritional information provision on the respondents' beef burger choice was, furthermore, significantly influenced by the factors influencing their beef burger of choice (i.e. (i) taste, (ii) familiarity, (iii) price, (iv) availability and (v) assumed nutritional content) ($p < 0,05$) (see Table 6). This result needs to be interpreted with caution, due to the presence of low and empty response cell counts for three of the five influencing factors. (These factors could not be combined to form one unified and accurate response to reduce the low and empty response cell counts.) Taste, followed by familiarity, were found to be the most important influencing factors among both groups of respondents (55,6% and 56,2%, respectively, and 22,2% and 35,6%, respectively), while price (3,7% and 4,1%, respectively) and availability (2,5% and 4,1%, respectively) were influencing factors for only a few respondents in both of the groups. Dissimilarity, however, emerged in the assumed nutritional content as factor. While a few (16%) of the respondents influenced in their beef burger choice by the provision, were influenced by the assumed nutritional content, none of the respondents who indicated that the provision would not influence their choice, was influenced by the assumed nutritional content in their choice (see Table 6).

Most probable influencing factors: The 12

TABLE 6: ASSOCIATION BETWEEN THE INFLUENCE OF THE NUTRITIONAL INFORMATION PROVISION ON THE RESPONDENTS' INTENDED BEEF BURGER CHOICE AND THEIR BEEF BURGER CHOICE WITHOUT NUTRITIONAL INFORMATION AND THE FACTORS INFLUENCING THE CHOICE

Respondent intended beef burger choice and the factors influencing the intended choice		Respondent percentage and number		Influence of nutritional information provision on intended beef burger choice				Significance[a,b]
				Yes		No		
		%	n	%	n	%	n	
Intended beef burger choice without nutritional information provision	Regular beef burger[c] with additions (extra items)	71,3	112	62,2	51	81,3	61	0,009[a]
	Regular beef burger[c] without additions (no extra items)	28,7	45	37,8	31	18,7	14	
	Total	100,0	157	100,0	82	100,0	75	
Factors influencing intended beef burger choice[d]	Familiarity	28,6	44	22,2	18	35,6	26	0,006[b]
	Taste	55,8	86	55,6	45	56,2	41	
	Price	3,9	6	3,7	3	4,1	3	
	Assumed nutritional content	8,4	13	16,0	13	0,0	0	
	Availability	3,2	5	2,5	2	4,1	3	
	Total	100,0	154	100,0	81	100,0	73	

[a] Fisher's exact test.
[b] Pearson's chi-square.
[c] For the purpose of the study a regular beef burger consisted of one white bread roll with one beef patty, sauce of choice, lettuce, tomato (1 slice), fried onions (1 tablespoon) and gherkins (2 slices).
[d] n = 154 as respondent sample (3 missing respondent answers with 'yes', n = 81 and 'no', n = 73).

factors found to significantly influence the respondents' intended choice of a beef burger after the nutritional information provision included: (i) smoking status and (ii) own perceived interest in the topic of 'food, nutrition and health' (as biographic and lifestyle characteristic influences); (iii) daily meal pattern during the week, (iv) meals most skipped during the week and (v) over the weekend, (vi) own dietary intake description, (vii) number of daily consumed fruit and (viii) whole grain servings, and (ix) daily fruit and vegetable consumption as the number of days per week consumed (as eating practice influences); and (x) fast food consumption frequency, (xi) beef burger choice and (xii) the factors influencing the beef burger choice (as fast food consumption influences). The results of the logistic regression applied to these findings of the respondent fast food and beef burger consumption (as representation of the respondent fast food consumption), eating practice, biographic and lifestyle data found to significantly influence the respondents to change their beef burger choice after the provision, indicated that the model, overall, is statistically significant (Wald chi-square = 48,463; p = 0,000). Three of the 12 predictor (explanatory or independent) variables were found to be significantly (p < 0,001) related to the respondent beef burger choice change after the provision; namely, the respondents' smoking status (biographic and lifestyle influence) (Wald chi-square = 20,656; df = 2), daily fruit and vegetable consumption (eating practice influence) (Wald chi-square = 34,689; df = 5) and the factors influencing the respondent beef burger choice (fast food consumption influence) (Wald chi-square = 48,463; df = 9). The Wald chi -square statistic found that that these predictors would be correct nearly 70% (68,2%, 67,6% and 69,6% respectively) of the time.

DISCUSSION

Nutritional information provision likely to influence the choice of a beef burger

Slightly more than half of the respondents indicated that they would be influenced by the provision of nutritional information in their intended beef burger choice. This finding supports previous USA studies (Avcibasioglu *et al*, 2011; Bollinger *et al*, 2011; Brissette *et al*, 2013; Dowray *et al*, 2013; Dumanovsky *et al*, 2011; Ellison *et al*, 2013; Krieger *et al*, 2013; Martinez *et al*, 2012; Morley *et al*, 2013; Pulos & Leng, 2010; Roberto *et al*, 2010; Wisdom *et al*, 2010) regarding the positive influence of energy provision to influence an intended purchase of a lowered energy-dense meal, in a hypothetical analysis. In addition, it may hypothetically

substantiate the theory by both Cohen and Bhatia (2012) and Martinez *et al,* (2012) that if consumers were made aware of the energy content of foods offered at fast food establishments, they might show an intention to make healthier food choices. Healthier food choices are persistently indicated to be a key lifestyle feature to support health and wellbeing.

Energy content, however, was seemingly not the most influential nutritional content factor in influencing an intended healthier fast food choice among the respondents in the study. The provision of the extended nutritional information additionally influenced the respondents in making an intended healthier fast food choice. This may support the finding by Elbel *et al,* (2009), which established energy information to have little influence on health-conscious consumers in their choice of a fast food, as these consumers, in theory, would already be aware of the energy content, and thus the influence of the provision would be lower in comparison.

Factors determining the influence of nutritional information provision on the choice of a beef burger

The 12 factors found to significantly influence the respondents' intended choice of a beef burger after the provision of nutritional information are discussed below. Among these factors, the respondent smoking status, daily fruit and vegetable consumption and the factors influencing the respondent beef burger choice, resulted as the three factors to have the most significance in the logistic regression analysis. These behaviours are all associated with a tendency towards increased health-consciousness, with research showing health-consciousness and the use of nutritional labels to be interrelated (Ellison *et al*, 2013; Graham & Laska, 2012; Hess *et al*, 2011; Zagorsky & Smith, 2017).

Biographic and lifestyle characteristic influences: Of the respondents who indicated that they would be influenced by the nutritional information provision in making their beef burger choice, most were non-smokers and interested in the topic of 'food nutrition and health'. The finding concerning the influence of smoking status is consistent with those of Cheah and Naidu (2012) and Cheah *et al,* (2015), who found the likelihood of nutritional label use to be higher among non-smokers. In support of these findings, Zagorsky and Smith (2017) found smoking to be associated with a lower interest in health.

An interest in the topic of 'food nutrition and health' provides new and additional findings in this area of food and nutrition research. There seems to be a shortage of available literature pertaining to an interest in the topic 'food, nutrition and health' among individuals, (including young adults), and its relation to nutritional information use. A recent study (Zagorsky & Smith, 2017) found an association between a higher interest in health, and a lowered consumption of fast food, as well as the reading of food labels to indicate an interest in health. The question that investigated the respondent interest in the topic 'food, nutrition and health' was described as "will regularly obtain/read information on the topic". On this premise, interest in food, nutrition and health could be a causal factor in considering nutritional labels to make healthier food choices.

Eating practice influences: Among the group of respondents who would be influenced by the nutritional information provision in their beef burger choice, meal-skipping during the week and on weekends, and in particular breakfast, were significantly lower in comparison to the group not being influenced by the provision as compared with de Magistris *et al,* (2010), results. This study found an association between individuals showing an inclination between making use of nutritional labelling information and adopting healthy eating habits (i.e. not snacking in between meals). To date, no studies have been published associating meal-skipping patterns of young adults with the use of nutritional information; thus these findings are novel in this regard. As eating regular meals, and not skipping meals, is commonly advised by nutrition professionals as part of a healthier meal pattern, this finding provides support as to the interrelatedness of health-consciousness and the use of nutritional information.

Similarly, there is a scarcity of data regarding food and dietary intakes and the utilisation of nutritional information. In the present study, respondents being influenced by the provision, were significantly influenced by their own description of their perceived dietary intakes (represented as either consuming types of foods or beverages popular with, or healthier in comparison to most young adults of their age), as well as their actual prudent food intakes (i.e. daily fruit, vegetable, and whole grain intakes). As the food and dietary features above denote health consciousness, the findings between the perceived healthier dietary intake, daily intakes of fruit and vegetables, and higher number of daily whole grain servings and nutritional information provision to influence a healthier fast food choice, adds to the interrelatedness of health-consciousness and the use of nutritional

information.

Fast food consumption influences: The influence of the nutritional information provision on the respondents' intended beef burger choice was significantly affected by the frequency at which they consumed fast food, where those respondents who indicated that the provision would influence their beef burger choice were significantly more likely to report fast food consumption less than once a month, and less likely to report fast food consumption at least once a week, in comparison to respondents who were not influenced by the provision. With a lower compared to a higher consumption of fast food, suggestive of a health-consciousness determinant, and the consumption of fast food considered a health concern, this finding further supports the interrelatedness of health-consciousness and the use of nutritional labels.

Among the group of respondents indicating that the provision would influence their intended beef burger choice, double the proportion also indicated that they consumed regular beef burgers without additions (no extra items) – therefore, a healthier fast food choice – *versus* respondents who indicated that the provision would not influence their beef burger choice. Further to this, among the respondents who chose a beef burger with additions, their choice was overwhelmingly the one with less additions (which already contributed a lower energy and macronutrient content) and their choice on the extended provision was further, never the one with a higher nutrient contribution. These findings coincide with the previously cited USA findings (Avcibasioglu *et al*, 2011; Bollinger *et al*, 2011; Brissette *et al*, 2013; Dowray *et al*, 2013; Dumanovsky *et al*, 2011; Ellison *et al*, 2013; Krieger *et al*, 2013; Martinez *et al*, 2012; Morley *et al*, 2013; Pulos & Leng, 2010; Roberto *et al*, 2010; Wisdom *et al*, 2010), showing a positive influence of the provision of nutritional information on fast food selection, and especially the energy content, to influence consumers in purchasing less energy-dense fast food items.

Factors influencing the intended choice of a beef burger were found to be particularly significant in influencing the choice on the provision, though this result should be considered with caution. Assumed nutritional content was only ranked as third after taste and familiarity among the respondents influenced by the provision, and did not rank (n = 0) as an influencing factor among respondents who were not influenced by the provision. This finding is similar to international (Harnack *et al*, 2008) and local (Jacobs *et al*, 2010; Oni & Matiza, 2014) study findings, which found nutrition to not be a significant factor in influencing the choice of a fast food. Though times may have changed, the low response indication for the assumed nutritional content among both groups of respondents may still support the earlier finding of Anderson *et al,* (2011), which reported the perceived healthfulness of fast food to be non-related to fast food consumption.

CONCLUSIONS AND RECOMMENDATIONS

Through the 12 factors found to significantly influence the respondent choice of a beef burger, the present study identifies health-conscious consumer attributes as the determinants associated with influencing the choice. In this regard, the study showed that the likeliness of the respondents to be influenced by the nutritional information provision on fast food, was significantly influenced by them having more health-conscious tendencies; the details of which have been explained in previous sections. These results coincide with previous literature (Ellison *et al*, 2013; Graham & Laska, 2012; Hess *et al*, 2011), showing health consciousness to be a strong predictor of increased utilisation of nutritional information. Among the 12 factors, the respondents' smoking status, daily fruit and vegetable consumption, and the factors influencing the beef burger choice, emerged as having the most significance. The findings around the perceived interest in the topic of 'food, nutrition and health', the meal-skipping pattern (during the week and over the weekend), healthier dietary intakes (own dietary intake description, healthier dietary intakes such as daily fruit and vegetable consumption, number of daily fruit servings, and number of daily wholegrain servings) and lower frequency of fast food consumption as significant influences on the respondent choice of a beef burger on the provision, are novel in this regard.

While being health-conscious is associated with healthier food intakes (Graham & Laska, 2012), the current study nonetheless proves that health -conscious respondents did still indicate that they consume fast food, albeit the fast food selections by these consumers were not the same as those who are less health-conscious. Rather, healthier selections made by the respondents when presented with nutritional information – that is, respondents in the study who reported being influenced by the provision – also made healthier fast food choices when presented with the provision, through their beef burger choices being lowest or lower in energy and macronutrient contributions. Health-consciousness alone, therefore, may not

necessarily predict healthier fast food choices. However, the provision of nutritional information on fast food could greatly assist consumers in making healthier choices, particularly those who frequently support burger establishments. In general, fast food consumers have been found to be quite poor at estimating the actual levels of fat, sodium and energy in these foods (Burton *et al*, 2009). Consequently, this provision may provide consumers with valuable information that they may or may not be aware of, or may not even have been seeking.

Despite these novel findings, the study does have several limitations, the foremost of which is the sampling. The purposive and convenience sample selection within the snowball sample application adopted a non-probability approach, whereby the sample may not have been representative of the population that the study was concerned with. The respondent sample was conveniently derived through the simple availability of candidates to the study through accessibility via the principal researchers' contacts and subsequent recruiters. With a purposive approach, although it is likely that the research would have obtained the required candidates and data, chances are higher that certain subgroups within the sample would have been larger and better represented due to the sample subgroup being more readily accessible. In addition, non-probability sampling could have also led to sample bias. The fact that the sampled individuals were required to have specific characteristics of interest to the study might have inferred bias. In support of this, working young adults were selected to fulfill the sample criteria. Higher education, employment status and income status have all been associated with an increased use of nutritional labels throughout the literature. As a result, this may have predicted a higher presence of users of nutritional labels and more outwardly health-conscious consumers in the current study, thus potentially rendering it not truly indicative of the target population and, for this reason, potentially inferring some degree of bias. Although this means that the sample may or may not represent the population adequately, this does not mean that the sample is not representative of the population under study. The results may, as a result, not be generalised to other populations and other types of fast food.

The study, in addition, relied on self-reported questionnaire data where the reliability of the questionnaire was not addressed. A further limitation to the study may be that, as the respondent sample was not making actual purchases of the fast food, their fast food choice might have reflected an intended choice and not the actual (purchased) choice, which would have been made at the fast food outlet upon receiving the nutritional information.

At present, in SA, the fast food industry has no obligation to provide nutritional information to consumers. Based on the current study and international findings of the influence of energy provision in promoting healthier fast food choices, as a first step therefore, the South African Department of Health could consider legislating the mandatory labelling of energy provision on fast food in SA. Since fast food consumption is associated with higher body weight and obesity and its ill-health gripping SA, such labelling has the potential to impact fast food consumption sales in SA by consumers becoming more aware of the unhealthy detriments of fast food consumption, and seeking healthier food alternatives. As a further step, the display of a more extensive nutritional information provision could be considered, as this display influenced a healthier fast food choice in comparison to energy provision alone in the current study. In support of this recommendation of a more extensive information provision, if, as the current study shows, potentially more health-conscious consumers are likely to be nutritional label users – and therefore are at higher odds of being influenced by the provision – this group of consumers is unlikely to be influenced by the provision of energy information alone as, in theory, these health-conscious consumers would already be aware of the information (Dumanovsky *et al*, 2011).

Though the current study had limitations, mainly in terms of the sampling methods employed and the intention-behaviour gap, it also lent itself to many strengths. It was, to our knowledge, the first study undertaken in SA to assess the influence of nutritional information provision on the choice of a fast food and, more specifically, on the choice of a beef burger. The study was, to our knowledge furthermore, the first study to assess the influence of extended nutritional information provision on the choice of a fast food and, more specifically, on the choice of a beef burger, in comparison to previous studies which have only assessed the influence of energy provision on the choice of restaurant or fast food choices. The study provided much strength in the case of extended nutritional information provision on the choice of a fast food item but, more importantly, contributed novel information to the field on factors that resulted in nutritional information provision being shown to influence the fast food consumer choice (though intended), of specifically a beef burger. These findings are new and may support and expand

existing literature to a field of food and nutrition allied with fast food consumption and nutritional information.

No fast food studies have been published in the City of Cape Town, nor in the Western Cape Province region, specifically pertaining to young adults. Literature regarding fast food consumption and its trends in SA is also still scarce. Research should hence be conducted to not only broaden the scope of fast food consumption information, but also the influence of nutritional information – including the influence of extended nutritional information provision – on the choice of fast food items among young adults in SA employing a different fast food subject, sample and sampling method. By using a more randomised approach for the sampling method, a future study in this regard could allow for a more accurate representation of health-conscious and non-health-conscious consumers among the fast food consumption population, allowing for potential comparisons. In addition, conducting a similar study on a lower socio-economic status (SES) demographic, or to not limit the SES, could provide a more accurate representation of fast food consumption and health-consciousness among a larger population. As the study was also hypothetical regarding a healthier fast food choice among the young adult fast food consumers, it may also be of great benefit to employ a similar study using actual fast food purchases to establish the choice among young adults to be influenced by nutritional information provision.

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