

Consumer attitudes towards the health benefits of 100% fruit juice in South Africa

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ABSTRACT

The health effects of 100% fruit juice have received widespread attention from both scientific and public forums. However, much of this literature has placed emphasis on the possible negative health risks of consuming pure (100%) fruit juice (PFJ). This research aims to explore South African consumers' attitudes towards the health benefits of PFJ, as well as determine if various consumption and socio-demographic factors have an association with consumers' attitudes. The study included 7 640 fruit juice consumers from cross-sectional research conducted in South Africa by means of a survey. The data was examined via a generalised linear model, which employed analysis of variance via Wald's Chi-square statistic distribution. A majority of participants were in agreement that PFJ held a number of health benefits. Heavy PFJ consumers and those that purchased fruit juice with the greatest frequency perceived more favourable health benefits than consumers who purchased and consumed PFJ with lower regularity. Female consumers who completed higher education levels; were of the Black population group; and came from high income groups displayed favourable attitudes regarding PFJ health benefits. The research shows that consumers have positive attitudes towards the health benefits of 100% fruit juice regardless of the ubiquitous negative press. However, several consumption (drinking and purchase incidence; time-of-day; and reasons for consumption) and socio-demographic (gender, education level and population group) variables had either positive or negative associations with consumers' attitudes.

Keywords: 100% fruit juice, consumer attitudes, health benefits, socio-demographics, South Africa, fruit juice consumption

INTRODUCTION

A multitude of recent investigations have considered the health benefits that are associated with pure (100%) fruit juice (PFJ), but revealed favourable and negative outcomes. The contradictory findings have been broadcasted via a number of public channels, which may have led to much uncertainty among consumers in terms of the questionable health benefits of PFJ consumption (O'Neil, Nicklas, Zanovec, Kleinman & Fulgoni, 2012:1871-1878; Boseley, 2014; Derbyshire, 2014; Saner, 2014; Hyson, 2015:37-51; Nicklas, O'Neil & Fulgoni 2015:112-121; Goko 2016:3; James 2016; Laganparsad 2016:2; Magwaza 2016:6; Seltzer & Steidle, 2016). Fruit juice marketers have generally positioned PFJ as a healthy drink to both adults and children (Seltzer & Steidle, 2016), but the possible health risks of high sugar intake (purportedly due to fruit juice consumption) have prominently featured in recent forums, which have largely ignored the health benefits (Popkin, 2012:591-593; Ntuli & Oelschig, 2016; Rampersaud, 2015:906-913; Mchiza, Parker & Labadarios, 2016:2293-2295). Consequently, the South African government has proposed a sugar tax to curb the potential health risks associated with high intake of sugar sweetened beverages (Goko 2016:3;

James 2016; Laganparsad 2016:2; Magwaza 2016:6). PFJ was initially exempt from the sugar tax (Goko 2016:3; Magwaza 2016:6), since it only includes natural sugar (fructose), but Child (2016:6) reported that PFJ will also incur the proposed 20% sugar tax, which has not yet been implemented. Seltzer and Steidle (2016) agrees that the high sugar content of PFJ outweighed the possible health benefits. However, O'Neil et al. (2011:1-10) disclosed that the lack of consensus among researchers and healthcare professionals may have caused confusion about the health benefits of PFJ. Hyson (2015:37-51) critically analysed scientific literature and determined that PFJ had many health benefits and disease prevention properties, but more research was necessary to address unanswered questions. Therefore, this study seeks to address the dearth of research in developing countries that deals with attitudes towards the potential health benefits of PFJ from a South African consumer viewpoint.

RESEARCH PROBLEM AND OBJECTIVES

The debate over the negative relationship between PFJ sugar content, diabetes, obesity and other health risks may have weakened the role of PFJ as part of a healthy balanced diet; thereby reducing essential vitamins and minerals intake; and nullifying other potential health benefits, especially among the lower socio-economic status consumers in South Africa. Hence, this study adheres to the Democratic Alliance (DA) and South African Sugar Association's (SASA) mandate to conduct additional research regarding South African consumers' diets before the implementation of a sugar tax. Furthermore, the DA and SASA stated that a single ingredient of a solitary food group would not curb obesity; a sugar tax would increase food prices for the poor; result in huge job losses; and negate the potential health benefits of certain food groups (such as PFJ) (Goko 2016:3; James 2016; Laganparsad 2016:2; Magwaza 2016:6; Mchiza et al., 2016:2293-2295). Clemens, Drewnowski, Ferruzzi, Toner and Welland (2015:236-243) suggested that the health benefits of PFJ should be communicated more clearly to consumers. South Africa still has large disparities in income and education levels and almost a quarter of the population live in poverty (Petzer & De Meyer, 2013:382-390). The aforementioned circumstances suggest that many South African consumers do not have access to health-related information due to their relatively poor socio-economic status. Therefore, it is also important to establish if usage and consumption patterns and socio-demographic variables have an impact on consumers' attitudes towards PFJ health benefits. Accordingly, the primary research objectives of this inquiry are as follows:

- To ascertain consumer attitudes towards the health benefits of PFJ.
- To establish if there is an association between consumers' attitudes towards the health benefits of PFJ and usage and consumption variables.
- To determine if socio-demographic variables have an influence on consumer attitudes towards the health benefits of PFJ.

LITERATURE REVIEW

South African fruit juice industry and consumer trends

One million tons of fruit were produced for the South African fruit juice market, which had a turnover of R10 billion in 2015 (Stanford, 2016). A majority (75%) of the fruit juice was produced for local consumption, but 25% was exported to mainly African markets (Stanford, 2016). PFJ is commonly marketed as a health beverage and the demand usually correlates with consumers' awareness of the potential health benefits (Elepu, Nabisubi & Serunkuuma., 2016:80-95). PFJ is of premium quality, but also commands a premium price, which is generally purchased by high income consumers (Elepu et al., 2016:80-95). Consumption of PFJ in developed countries was 44 litres per capita versus a relatively low consumption of 12 litres per capita in South Africa (Richards, 2016:23).

Lower-income consumers typically purchase cheaper fruit classifications, which include sugar-sweetened beverages such as fruit drinks (6%), squashes (24% juice undiluted and 6% diluted) and fruit nectars (12.5% - 50% dependent fruit type), but contain less real fruit juice and added sugar (Elepu et al., 2016:80-95; SAFJA, 2017). Stanford (2016) reported that fruit juice concentrate (fruit drinks and squashes) consumption increased by 6.4% from 2012 to 2015, whereas ready-to-drink fruit (fruit nectars/blends and 100% fruit juice) decreased by 6.3% over the

same period. However, Ntuli and Oelschig (2016) revealed that PFJ had gained share from reconstituted fruit juice (fruit nectars/blends), despite the overall decline in volume and higher PFJ price, since consumers were seeking products with greater health benefits and disease prevention attributes. Jönsson (2016) confirmed that there was a trend for consumers to move towards products that were “all natural” such as PFJ, but that some consumers had decreased consumption due to the pervasive sugar debate.

PFJ health benefits debate

A number of conflicting messages (emanating from fruit juice marketers, schooling, government health organisations, academics and other sources) have been disseminated via public and scientific forums regarding PFJ's health benefits and/or risks (O'Neil, Nicklas, Zanovec, Kleinman & Fulgoni, 2012:1871-1878; Boseley, 2014; Derbyshire, 2014; Saner, 2014; Hyson, 2015:37-51; Nicklas et al., 2015:112-121; Goko 2016:3; James 2016; Laganparsad 2016:2; Magwaza 2016:6; Seltzer & Steidle, 2016). Furthermore, there is also a lack of agreement among healthcare professionals and researchers.

O'Neil et al. (2011:1-10) compared the diet quality of PFJ consumers with non-consumers and established that the consumption of PFJ was positively connected with healthy balanced diets. PFJ consumption has been associated with many health benefits, with a reduced risk for hypertension, certain cancer types and cardiovascular disease (O'Neil et al., 2011:1-10; O'Neil et al., 2012:1871-1878; Nicklas et al., 2015:112-121; Clemens et al., 2015:236-243). Overall, PFJ consumers' dietary profiles comprised of significantly decreased intakes of saturated fatty acids, discretionary fat and added sugars; and increased intakes of vitamin C, vitamin B6, potassium, magnesium, iron, folate and riboflavin when compared to non-consumers of PFJ (Landon & Baghurst, 2010:1-12; O'Neil et al., 2012:1871-1878; Nicklas et al., 2015:112-121). PFJ intake also resulted in an improved, healthy balanced diet quality and an increased consumption of whole fruit, while overall sugar consumption was found to decrease (O'Neil et al., 2011:1-10; Nicklas et al., 2015:112-121). Huang, Wahlqvist, Kao, Wang and Lee (2015:5664-5683) revealed that a varied diet (even with the inclusion of a single nutrient, namely magnesium) resulted in a decline of mortality risk in adults; hence, the nutritional value of the underlying diet is important to micronutrient efficacy. PFJ provides many nutrients in a cost effective manner, which assists low-income consumers, especially in emerging countries, to acquire their daily vitamins and mineral requirements (Landon & Baghurst, 2010:1-12; O'Neil et al., 2012:1871-1878; Hyson, 2015:37-51).

Several studies contradicts the abovementioned positive predisposition and portrays PFJ as being harmful to consumers' health by advising that it contributes to Type 2 diabetes, cardiovascular disease, tooth decay and obesity (Derbyshire, 2014; Seltzer & Steidle, 2016). There is also no consensus that PFJ has the same benefits as fruit, and several researchers have reported that PFJ has less dietary fibre (Pase, Grima, Cockerell & Pipingas, 2015:68-72; Seltzer & Steidle, 2016). Landon and Baghurst (2010:1-12) reported that there was no difference in fibre intake between those who did and did not consume PFJ. Huth, Fulgoni, Keast, Park and Auestad (2013:116) and Lustig (2013:226-235) reported that PFJ contained high quantities of natural sugar (fructose), which accounted for a high percentage of daily sugar intake. Several investigations have confirmed an association between PFJ consumption and obesity (Melgar-Quinonez & Kaiser, 2004:1110-1119; Faith, Dennison, Edmunds & Stratton, 2006:2066-2075), but other studies have not found a relationship between PFJ intake and overweight/obesity (O'Neil et al., 2011:1-10; O'Neil et al., 2012:1871-1878; Nicklas et al., 2015:112-121). Furthermore, Landon and Baghurst (2010:1-12) and Clemens et al. (2015:236-243) reported an inverse relationship between PFJ consumption and obesity when comparing consumers versus non-consumers of PFJ. Saner (2014) and Seltzer and Steidle (2016) propose that government should reconsider PFJ counting towards the two servings recommendation of fruit owing to its high sugar content, which could be associated with an increased risk of Type 2 diabetes. Pase et al. (2015:68-72) agree that high fructose consumption may result in diabetes and metabolic syndrome. However, van Buul, Tappy and Brouns (2014:119-130) argue that the existing evidence was inadequate to conclude that the consumption of fructose was the main cause of metabolic diseases. Eshak et al. (2013:300-308) and Imamura et al. (2015:1-12) reveal that the association of regular PFJ consumption and the increased risk of Type 2 diabetes were not confirmed.

The contradictory information about the potential harmful effects of PFJ has filtered into the media, which may have resulted in the nutritional and health benefits being largely disregarded in a developing country where many do not meet the necessary daily vitamins, minerals and nutrients requirements (O'Neil et al., 2012:1871-1878; Rampersaud, 2015:906-913). Hence, the possible diminished contribution of PFJ as part of a healthy balanced diet quality has made it necessary to investigate the attitudes of consumers towards the health benefits of PFJ in South Africa.

METHODOLOGY

Sampling

The convenience sample included consumers of fruit juice who mainly lived in the City of Cape Town municipal district in the Western Cape, South Africa. The fieldworkers conducted the survey in various geographic clusters, which included townships and informal settlements (predominantly lower socio-economic status areas) and suburbs (mainly higher socio-economic status areas) in urban and rural regions, so as to obtain a demographically representative sample. Subsequently, a diverse range of participants in different family life-cycle (traditional and non-traditional) stages were surveyed in a developing country (refer to Table 4 for an overview of the socio-demographic factors).

Data collection and questionnaire formulation

A structured self-administered questionnaire was used, which allowed fruit juice consumers to participate in the survey on their own stead without receiving assistance from the fieldworkers, in that way eradicating interviewer bias. Instructions were given at the beginning of the questionnaires, where the purpose of the research was explained; the fact that their participation was voluntary; and that the survey would not take longer than ten minutes to complete. The fieldworker also assured participants that their responses would be treated as confidential, and that their identities would be completely anonymous, especially owing to the fact that no personal/contact particulars were requested. Informed consent was then obtained by the fieldworkers once the participants agreed to participate in the survey. The fieldworkers were allocated to the various geographic clusters and the data was collected from 7 640 participants over a three month period.

The research instrument was a single page in length, and was solely comprised of closed-ended questions in the form of Likert scales and multiple-choice questions. The questionnaire included three sections. The first section requested information concerning fruit juice consumption variables via six multiple-choice questions. The second section contained a five-item construct to ascertain consumer attitudes vis-à-vis the health benefits of PFJ through a five-point Likert scale with statements that ranged from "strongly disagree" (1) to "strongly agree" (5). The construct items were taken from Landon and Baghurst (2010:1-12); Clemens et al. (2015:236-243); and Nicklas et al. (2015:112-121). The final section of the research requested socio-demographic variables via seven multiple-choice questions taken from South African census data (Statistics South Africa, 2012:17-62).

Statistical analysis

The questionnaires were first meticulously examined to ensure that they were correct and complete before they were numbered, coded, captured and analysed via statistical program known as SPSS. Thereafter, simple descriptive statistical techniques were utilised to ascertain means and frequencies in order to provide an overview of the results. A generalised linear model (GLM) was employed to determine the association between the dependent variable (PFJ health benefits attitude construct) and independent variables (consumption and socio-demographic variables). Analysis of variance (ANOVA) was utilised to measure the various means via Wald's Chi-square statistic distribution, and sought to ascertain if there were significant differences between the PFJ health benefits attitude construct and consumption and socio-demographic variables. The Bonferroni pairwise comparison post hoc statistic was utilised to establish where the differences were between the aforementioned variables. The reliability measures

**TABLE 1:
DESCRIPTIVE, VALIDITY AND RELIABILITY STATISTICS
OF THE PFJ HEALTH BENEFITS CONSTRUCT**

PFJ health benefits construct	Mean	Std. Dev.	Factor loadings	AVE	CR	Cronbach's Alpha
Pure (100%) fruit juice can play an important role as part of a healthy balanced diet.	3.66	1.067	0.758			
A glass of pure fruit juice counts towards the recommended 2 serves of fruit per day.	3.52	0.974	0.725			
Pure fruit juice contains antioxidants, which are associated with a range of health benefits, including reducing the risk of certain cancers and cardiovascular disease.	3.52	0.972	0.719	0.511	0.840	0.775
Pure fruit juice is important in one's diet as it provides nutrients for disease prevention.	3.61	0.960	0.715			
Apart from being an important source of fluids, pure fruit juice provides essential vitamins and minerals.	3.76	0.922	0.657			

**TABLE 2:
SPEARMAN'S CORRELATION COEFFICIENT OF THE PFJ HEALTH BENEFITS CONSTRUCT**

PFJ health benefits attitude measure items	1	2	3	4	5
Pure (100%) fruit juice can play an important role as part of a healthy balanced diet (1)	1.000				
A glass of pure fruit juice counts towards the recommended 2 serves of fruit per day (2)	0.460**	1.000			
Pure fruit juice contains antioxidants, which are associated with a range of health benefits, including reducing the risk of certain cancers and cardiovascular disease (3)	0.380**	0.438**	1.000		
Pure fruit juice is important in one's diet as it provides nutrients for disease prevention (4)	0.332**	0.359**	0.449**	1.000	
Apart from being an important source of fluids, pure fruit juice provides essential vitamins and minerals (5)	0.360**	0.322**	0.381**	0.434**	1.000

** Correlation is significant at the 0.01 level (2-tailed)

were assessed by means of the Cronbach's Alpha coefficient and composite reliability (CR), which yielded overall scores of 0.775 and 0.840 respectively (refer to Table 1). These values show a good level of internal consistency for the PFJ health benefits attitude construct, since both reliability measures exceeded the recommended threshold value of 0.7 (Bagozzi & Yi, 1998:74-94).

The cogency of the PFJ health benefit measure was assessed via a confirmatory factor analysis (CFA) using SPSS. The CFA established that the factor loadings were all greater than 0.6 (0.657 – 0.758), thereby exceeded the recommended levels. The average variance extracted (AVE) also exceeded the proposed threshold of 0.5 (0.511) (refer to Table 1); therefore, these values are suggestive of validity (Hair, Ringle & Sarstedt, 2011:139-151; Bagozzi & Yi, 2012:8-34). Additionally, the PFJ health benefits attitude construct exhibited predominantly medium positive correlation, with the coefficients ranging from 0.322 – 0.460, which showed that the construct variables displayed an overall convergence of responses (refer to Table 2).

**TABLE 3:
USAGE AND CONSUMPTION VARIABLES
DESCRIPTIVE STATISTICS AND INFLUENCE ON PFJ HEALTH BENEFITS ATTITUDE CONSTRUCT**

Usage and consumption variables	n	%	Mean	Std. Error	p
Drinking prevalence					
Several times a day (1)	1 126	14.7	3.74	0.709	0.000*
Daily (2)	1 840	24.1	3.73	0.629	
2 - 4 times a week (3)	2 233	29.2	3.65	0.619	
2 - 3 times a month (4)	1 440	18.8	3.62	0.642	
Rarely or never (5)	1 001	13.1	3.38	0.741	
Purchase incidence					
Several times a day (1)	520	6.8	3.70	0.725	0.029**
Daily (2)	1 630	21.3	3.70	0.645	
2 - 4 times a week (3)	2 577	33.7	3.70	0.632	
2 - 3 times a month (4)	1 962	25.7	3.63	0.649	
Rarely or never (5)	951	12.4	3.38	0.724	
Time-of-day consumption					
Breakfast (1)	705	9.2	3.66	0.641	0.000*
Lunchtime (2)	1 238	16.2	3.65	0.636	
Supper (3)	940	12.3	3.58	0.635	
Between meals (4)	1 796	23.5	3.72	0.640	
All of these options (5)	1 222	16.0	3.71	0.690	
No specific times (6)	1 739	22.8	3.53	0.702	
Reasons for consumption					
It's healthier than other drinks (1)	2 162	28.3	3.81	0.647	0.000*
It's refreshing (2)	1 477	19.3	3.65	0.626	
I like the taste (3)	1 360	17.8	3.62	0.610	
My family prefers it (4)	731	9.6	3.58	0.672	
Inexpensive (5)	258	3.4	3.60	0.644	
Widely available (6)	379	5.0	3.55	0.676	
To quench my thirst (7)	587	7.7	3.61	0.689	
Other (8)	257	3.4	3.38	0.712	
I don't know (9)	429	5.6	3.24	0.718	
Other beverage partiality					
Soft drinks/soda (1)	2 232	29.2	3.64	0.626	0.000*
Diet soft drinks/soda (2)	960	12.6	3.64	0.656	
Sports or energy drinks (3)	829	10.9	3.73	0.654	
Alcoholic beverages (4)	663	8.7	3.52	0.650	
Hot beverages (5)	834	10.9	3.59	0.645	
Bottled water (6)	814	10.7	3.65	0.695	
Tap water (7)	633	8.3	3.63	0.745	
Sweetened beverages powder/syrup (8)	471	6.2	3.66	0.685	
None, I prefer to drink Fruit Juice most (9)	204	2.7	3.92	0.758	
Factors that increase consumption					
Information on nutrition/health benefits (1)	2 280	29.8	3.70	0.667	0.000*
Increase awareness of benefits via advertising (2)	1 205	15.8	3.61	0.615	
Lower prices (3)	1 497	19.6	3.67	0.638	
If other family members drank Fruit Juice (4)	711	9.3	3.53	0.666	
Improved taste (5)	792	10.4	3.60	0.693	
Other (6)	502	6.6	3.42	0.749	
I drink enough Fruit Juice (7)	653	8.5	3.78	0.643	

* Wald's Chi-square test showed a significant difference at $p < 0.001$

** Wald's Chi-square test showed a significant difference at $p < 0.05$

^A Bonferroni correction pairwise comparisons mean difference is significant at the 0.001 level.

^B Bonferroni correction pairwise comparisons mean difference is significant at the 0.05 level.

**TABLE 4:
SOCIO-DEMOGRAPHIC FACTORS VARIABLES
DESCRIPTIVE STATISTICS AND INFLUENCE ON PFJ HEALTH BENEFITS ATTITUDE CONSTRUCT**

Socio-demographic variables	n	%	Mean	Std. Error	p
Gender					
Male (1)	3 559	46.6	3.61	0.673	0.002**
Female (2)	4 081	53.4	3.67	0.657	(2) - (1) ^B
Age					
16 - 25 years (1)	3 373	44.1	3.65	0.651	0.598
26 - 35 years (2)	2 299	30.1	3.64	0.666	
36 - 45 years (3)	1 143	15.0	3.60	0.682	
46 - 55 years (4)	527	6.9	3.64	0.688	
56 - 65 years (5)	200	2.6	3.64	0.720	
66+ years (6)	98	1.3	3.66	0.711	
Marital status					
Single (1)	4 417	57.8	3.66	0.652	0.896
Married (2)	1 962	25.7	3.63	0.683	
Widow/widower (3)	394	5.2	3.59	0.700	
Living together (4)	638	8.4	3.60	0.676	
Divorced (5)	229	3.0	3.60	0.665	
Education level					
Grade 1 - 7 (1)	298	3.9	3.50	0.741	0.000*
Grade 8 - 11 (2)	856	11.2	3.55	0.663	
Grade 12 (3)	3 363	44.0	3.65	0.662	
Diploma or degree (4)	2 375	31.1	3.65	0.656	
Post-graduate degree (5)	748	9.8	3.70	0.667	
Employment status					
Student (1)	2 633	34.5	3.67	0.647	0.051
Employed (Full-time) (2)	2 621	34.3	3.62	0.687	
Employed (Part-time) (3)	877	11.5	3.63	0.654	
Self-employed (4)	545	7.1	3.65	0.643	
Unemployed (5)	356	4.7	3.55	0.645	
Learner (6)	285	3.7	3.64	0.681	
Pensioner (7)	132	1.7	3.66	0.713	
Housewife/homemaker (8)	124	1.6	3.71	0.678	
Not working - other (9)	67	0.9	3.72	0.752	
Population group					
Black (1)	3 690	48.3	3.68	0.636	0.035**
Coloured (2)	2 520	33.0	3.60	0.682	
White (3)	992	13.0	3.63	0.708	
Indian (4)	337	4.4	3.59	0.679	
Asian (5)	101	1.3	3.52	0.728	
Monthly household income					
Less than R800 (1)	1 306	17.1	3.61	0.678	0.009**
R801 - 3 200 (2)	1 539	20.1	3.65	0.645	
R3 201 - 6 400 (3)	1 122	14.7	3.63	0.655	
R6 401 - 12 800 (4)	1 204	15.8	3.63	0.659	
R12 801 - 25 600 (5)	1 393	18.2	3.70	0.637	
R25 601 - 51 200 (6)	803	10.5	3.63	0.745	
R51 201 - 102 400 (7)	197	2.6	3.58	0.656	
R102 401+ (8)	76	1.0	3.63	0.726	

RESULTS

A total of 7 640 South African fruit juice consumers participated in the study. A full descriptive statistical overview of the consumption and socio-demographic variables are displayed in Tables 3 and 4 on the previous page.

PFJ health benefits attitude construct

A descriptive analysis of the PFJ health benefits attitude construct resulted in a mean value of 3.64 (Std. Dev. = 0.666). The Wald Chi-Square test distribution revealed that the PFJ health benefits construct was significant at $p < 0.001$, thereby showing that South African consumers viewed PFJ as being healthy.

Association of usage and consumption variables with the PFJ health benefits attitude construct

All six of the usage and consumption variables produced significant differences in terms of the PFJ health benefits attitude construct (refer to Table 3):

- **Drinking prevalence ($p < 0.001$):** Respondents who drank fruit juice several times a day (14.7%), daily (24.1%), 2 – 4 times a week (29.2%)* and 2 - 3 times a month (18.8%) displayed more favourable attitudes of fruit juice health benefits than those who rarely or never (13.1%) consumed fruit juice;
- **Purchase incidence ($p < 0.05$):** Respondents who purchased fruit juice several times a day (6.8%)*, Daily (21.3%) and 2 - 4 times a week (33.7%)* exhibited higher positive attitudes towards fruit juice health benefits compared to those who rarely or never drank fruit juice (12.4%)
- **Time-of-day consumption ($p < 0.001$):** Respondents who drank fruit juice during breakfast (9.2%)*, lunchtime (16.2%), supper (12.3%) and at no specific time (22.8%)* presented less favourable attitudes in terms of fruit juice health benefits compared to those who consumed fruit juice between meals (23.5%) and for all of the options (i.e. breakfast, lunchtime, supper and between meals) (16%);
- **Reasons for consumption ($p < 0.001$):** Respondents who disclosed that fruit juice was healthier than other drinks (28.3%) resulted in more positive attitudes of health benefits in comparison to those who noted that fruit juice was refreshing (19.3%), liked the taste (17.8%), their family preferred it (9.6%), was inexpensive (3.4%), widely available (5%), quenched their thirst (7.7%) and other reasons (3.4%) in comparison to those who did not know why they drank fruit juice (5.6%);
- **Other beverage preference incidence ($p < 0.001$):** Respondents who indicated that they preferred to consume fruit juice over other beverages (2.4%) exhibited higher positive attitudes towards the health benefits compared to those who preferred to drink soft drinks/soda (29.2%), diet soft drinks/soda (12.6%), alcoholic beverages (8.7%), hot beverages (10.9%), bottled water (10.7%) and tap water (8.3%); and
- **Factors that increase consumption ($p < 0.001$):** Respondents who stated that “if other family members drank fruit juice” (9.3%) showed less favourable predispositions compared to respondents who noted that information about nutrition/health benefits (29.8%), lower prices (19.6%) and that they drank enough fruit juice (8.5%) would increase their fruit juice consumption. Respondents who revealed that they drank enough fruit juice (8.5%) also displayed more positive attitudes than those who stated increased awareness of benefits via advertising (15.8%), if other family members drank fruit juice (9.3%) and other reasons (6.6%), would increase their fruit juice consumption.

Association of socio-demographic variables with the PFJ health benefits attitude construct

No significant differences were found for age, marital status and employment status, but the following socio-demographic variables* were found to yield significant differences in terms of the PFJ health benefits attitude construct (refer to Table 4):

*Usage and consumption / Socio-demographic variables did not show a significant difference according to Wald's Chi-square test and/or Bonferroni correction pairwise comparisons, but the mean and standard error values were closely aligned with the other significant variables' mean and standard error values (refer to Table 3 and Table 4).

- **Gender ($p < 0.05$):** Female respondents (53.4%) displayed more favourable attitudes of fruit juice health benefits than male respondents (46.6%);
- **Highest education level ($p < 0.001$):** Respondents who had completed grade 12 (44%), had a diploma or degree (31.1%), and a post-graduate degree (9.8%) exhibited higher positive attitudes towards fruit juice health benefits compared to those who had completed grade 1 - 7 (3.9%) and grade 8 – 11 (11.2%);
- **Population group ($p < 0.05$):** Black respondents' (48.3%) attitudes of health benefits of fruit juice were more positive than Coloured respondents (33%) and White respondents (13%); and
- **Average monthly household income ($p < 0.05$):** Respondents with a household income of R12 801 - R25 600 (18.2%) exhibited higher positive attitudes towards the health benefits of fruit juice than those who earned less than R800 per month (17.1%), R801 and R3 200 (20.1%)*, R3 201 - 6 400 (14.7%)* and R6 401 - 12 800 (15.8%)*.

DISCUSSION

The main aim of the study was to ascertain consumer attitudes towards the health benefits of PFJ. The findings show that fruit juice consumers perceive PFJ as having a number of health benefits (Landon & Baghurst, 2010:1-12; O'Neil et al., 2011:1-10; O'Neil et al., 2012:1871-1878; Nicklas et al., 2015:112-121; Clemens et al., 2015:236-243; Hyson, 2015:37-51; Huang et al., 2015:5664-5683), which include: PFJ plays an important role as part of a healthy balanced diet; a glass of PFJ counts towards the recommended 2 servings of fruit per day; PFJ contains antioxidants, which are associated with a range of health benefits, including reducing the risk of certain cancers and cardiovascular disease; PFJ is important in one's diet as it provides nutrients for disease prevention; PFJ is an important source of fluids and provides essential vitamins and minerals; and PFJ is a rich source of vitamin C and potassium. Hence, this study established that many South African consumers believe that PFJ is healthy, which is in consensus with the findings of several other studies despite the conflicting results that have been widely disseminated through public platforms (Landon & Baghurst, 2010:1-12; O'Neil et al., 2011:1-10; O'Neil et al., 2012:1871-1878; Nicklas et al., 2015:112-121; Clemens et al., 2015:236-243).

A number of usage and consumption variables had an association with consumer attitudes towards the health benefits of PFJ. Consumers who drank fruit juice with higher frequency perceived more favourable health benefits than those who consumed it rarely or never. This is a logical result, since heavy users may consume PFJ for its potential health benefits (Insight Survey, 2016). Consumers who purchased fruit juice more frequently observed more positive health benefits than those who purchased it rarely or never. This is also a practical supposition and is synonymous with the above-mentioned result viz. heavy users perceive PFJ as being healthy (Insight Survey, 2016). Consumers who drank fruit juice between meals and with all meals displayed more favourable attitudes than those who only consumed fruit juice with certain meals such as lunchtime and supper. It can be expected that consumers who drank fruit juice with higher frequency (i.e. between meals and/or with all meals) than those who drank fruit juice with specific meals; therefore, perceived PFJ as being healthy as discussed in the two above results. Consumers who observed fruit juice as being healthier than other drinks exhibited the most positive predisposition towards fruit juices' health benefits, whereas consumers who did not know why they drank fruit juice showed the least favourable inclination. Consumers who drank fruit juice specifically for its health benefits should understandably be more favourably disposed than those who did know why they consumed fruit juice, which is also in congruence with the health trends witnessed in many developing and developed countries (European Fruit Juice Association, 2014; Stanford, 2016). Consumers who preferred to consume fruit juice over other beverages demonstrated the greatest positive attitudes towards its health benefits, which is a rational predisposition. Consumers who are loyal to generic products (in this case fruit juice) should have increased knowledge of their respective health benefits. Consumers who stated that they may consume more fruit juice if the prices were lower; drank enough fruit juice; and had information about its nutrition/health benefits, displayed the most favourable attitudes towards the health benefits of PFJ. Hence, consumers desired increased dissemination of information, and/or lower prices to increase their consumption of fruit juice, which is understandable in emerging nations that have large disparities in infrastructure (access to information) and wealth compared to first-world countries (Petzer & De Meyer, 2013:382-390).

Several socio-demographic variables factors had an association with consumer attitudes towards the health benefits

of PFJ. Female consumers exhibited the most positive attitudes regarding health benefits of PFJ. This is a rational result in an emerging nation, since mothers and daughters are responsible for running the day-to-day affairs of the large number fatherless households (Philippe, 2006:3-8), and accordingly, would attempt to make healthy food choices for the family (Duh &, Struwig, 2015:89-101). Consumers who completed higher education levels exhibited the greatest positive attitudes towards fruit juice health benefits. This is a practical supposition, since Bradshaw (2008:51-69) disclosed that education formed an essential role in improved health status in South Africa. Black consumers' attitudes towards the health benefits of fruit juice were more positive than Coloured consumers. This result can be explained by the fact that many Black consumers in South African have experienced a significant increase in spending power, education access, information access and general social economic status since the abolishment of Apartheid (over two decades ago) (Bradshaw 2008:51-69; Petzer & De Meyer 2013:382-390; Duh & Struwig 2015:89-101). Consumers with higher household incomes displayed the most favourable attitudes towards the health benefits. Low income consumers may not purchase PFJ as frequently owing to restrictive financial resources and, therefore, may not consider the potential health benefits. The large wealth disparity has caused major health status inequalities among the South African population (Bradshaw 2008:51-69; Petzer & De Meyer 2013:382-390).

CONCLUSION AND IMPLICATIONS FOR MARKETERS

The study concluded that consumers generally maintained positive attitudes towards PFJ health benefits despite the conflicting messages received from various stakeholders and public sources, and the divergent results of healthcare researchers and professionals regarding PFJ's health risks. Hence, fruit juice marketers should continue to emphasise the health benefits in their marketing communications by using the rational advertising appeal to reinforce the main health features of PFJ and allowing to them to take advantage of the prevailing health trend (European Fruit Juice Association, 2014; Ntuli & Oelschig, 2016; Stanford, 2016). Furthermore, manufacturers of fruit juice could also change package sizes to meet the suggested daily consumption of PFJ, as well as produce new fruit juice blends and vegetable formulations with added health benefits and lower sugar content to circumvent negative publicity (Ntuli & Oelschig, 2016). Several usage and consumption variables led to either a favourable or negative association with consumers' attitudes towards PFJ health benefits, which have not been considered in prior research in developing countries. Hence, in summary, it can be concluded that: heavy fruit juice consumers were more knowledgeable about fruit juice health benefits; consumers who bought fruit juice more often perceived improved health benefits; South African consumers who consumed fruit juice with all meals and between meals showed more positive attitudes; consumers who did not know why they drank fruit juice exhibited the least positive attitudes versus consumers who perceived fruit juice as being healthier than other drinks; South Africans who drank fruit juice especially for its health benefits maintained positive attitudes in contrast to those who did know why they drank fruit juice; and consumers who favoured fruit juice over other beverages exhibited positive predispositions towards PFJ health benefits. These aforementioned usage and consumption factors indicate that fruit juice marketers should launch a widespread information campaign, especially among less frequent PFJ consumers, in an attempt to change their perceptions about the potential health benefits, and provide them with the necessary information to follow a healthier diet (as proposed by Clemens et al., 2015:236-243). Furthermore, consumers who desired lower prices, more information, and/or drank enough fruit juice displayed the greatest positive attitudes towards the health benefits of PFJ, which reinforces the abovementioned recommendation, but also shows marketers that price is an important purchase stimulus. Hence, marketers could use both smaller package sizes and bulk promotions, as well as create new recipes and brands to make PFJ more affordable.

Several socio-demographic variables resulted in favourable attitudes towards PFJ health benefits, which have not been considered in previous investigations in developing nations. Hence, in summary, it can be concluded that: females; Black Africans; high education levels; and high household incomes showed the most positive attitudes regarding the potential health benefits of PFJ in South Africa. Hence, marketers could attempt to change the perceptions by launching an extensive information campaign about the potential health benefits of PFJ (Clemens et al., 2015:236-243), and by reducing prices via smaller package sizes to reach a majority of South Africa consumers who have lower education and income levels.

LIMITATIONS AND FURTHER INVESTIGATION

The study took a cross-section of the research population via a survey, but a longitudinal design would yield a more extensive representation of the sentiments towards the health benefits of PFJ over an extended time frame. The research only considered consumers attitudes towards PFJ, whereas the different classifications of fruit juice were not considered; hence, an investigation could consider the attitudes towards the different fruit classifications to establish if these resulted in analogous findings. This inquiry only investigated South African consumers (in a single province) perceptions towards PFJ health benefits, whereas the study should also be conducted in other developed and developing countries to establish if divergent or similar perceptions are prevalent, thereby yielding a more comprehensive understanding of consumer attitudes.

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