

Consumer decision-making and segmentation of dates market in Saudi Arabia

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Received: 14 December 2022; Accepted: 26 July 2023; Published: 24 September 2023

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PAPER

Abstract

The study aimed to investigate factors influencing purchasing of dates in Saudi Arabia and its market segmentation. Principal components analysis (PCA) and clustering were used on the data obtained by interviewing a sample of 280 people. The main findings indicated two major principal components (PCs) explaining consumer behaviour: marketing accounted for 51.7% of the population's information and gender and job determine 20.83%. Clustering provided three groups of consumers: (1) poor or unemployed women interested in the lowest price, (2) wealthy women interested in marketing motivation and (3) less wealthy women interested in price promotion. The study recommended a pink marketing strategy for wealthy women.

Keywords: dates, clustering analysis, consumer purchasing decision, principal component analysis, Saudi Arabia

Introduction

In Gulf countries, marketing strategies so far have been based solely on one-way view of producer behaviour determinants, that is, the framework of firm management, such as product, price, place, and promotion (Kotler, 2012). This appears as an insufficient locomotive for the development of date sector in Saudi Arabia (Tuncalp, 1988). In spite of having an abundance of dates markets, Saudi Arabia, the largest producer of dates, is constrained by commercial issues surrounding their sale and distribution. This is due to the fact that date producers and traders have not considered the dynamic changes taking place in Saudi society in terms of the entrance of consumerism and modern lifestyle model (Assad, 2007) and changing preferences, particularly related to women. Indeed, because of Saudi Arabia's new legislation, women have become the key to the dynamism of the future food market for at least three reasons, such as their engagement in socio-economic activities, mobility, and high level of education.

On the one hand, according to the 2030 Vision, working regulations give women and men equal rights to obtain decent jobs with the same financial benefits, remunerations, and working hours (Saudi Government Portal, 2022). This not only ensured their financial autonomy and also increased their expenditure according to their wellness, requirements and preferences. In addition, women have become self-reliant by visiting malls, markets, forums, restaurants, cafes etc. Moreover, recent regulations have provided them permission to have driving licenses, and they can have entertainment without men's company anywhere in the form of shopping, eating, and socialising. In terms of global indicators of mobility, workplace, managing entrepreneurship, and asset indicators, Saudi women scored 80 on a maximum scale of 100, meaning that they live in an economy that has removed restrictions or introduced relevant legal rights and protection (World Bank, 2022).

New regulations also encourage women to pursue higher education, particularly going abroad, by providing them

grants and facilitating their travelling abroad to have advanced skills, learn foreign culture, and imitate modern lifestyles. According to the World Bank (2022) report, these facts have reduced the gender global gap index, mainly in terms of economic participation and opportunities and educational attainment of Saudi women, which scored 0.636 (127th), rather than 0.603 (147th) in 2021. It reflected on Saudi women's responsibility towards making decisions, mainly in purchasing, and contributing to improve their tastes, learning how to enjoy themselves, and achieving their pleasures. These results demonstrate that women's purchasing preferences have become more oriented by new goods' parameters, such as brands, layering, packing and packaging, taste etc.

In the context of Saudi women's life transformations, especially regarding consumption preferences, the main issue of interest for researchers is to study the extent the food sector is able to take advantage of Saudi women's new consumption model. The present study aimed to explore key factors influencing consumer purchasing decisions for dates, given that women's income has recently increased dramatically and their responsibility to make home purchasing decisions has increased by 85% (Darroch, 2015). How can consumers' classifications orient producers to adapt their marketing plans to a market segmentation strategy? To study these issues, the present research was split into the following five sections: literature review, research methodology, results, discussion and conclusion.

Literature review

A review of economic literature provided consumer decision-making (CDM) theories to frame the problem of market segmentation strategy. The first approach was traditional, viewing CDM as a cognitive process, also called rational or consciousness. It consisted of the basis for CDM that determined the outward expressions of a person regarding willingness and requirements (McDonald, 1998). In fact, grand models created during the 1960s and 1970s by Kassarian (1971) frequently used a logical problem-solving strategy to justify purchasing decisions (Milner and Rosenstreich, 2013). Two requirements must be satisfied for considering CDM as a reasonable approach: first, the product's functions and utility must be assessed properly (Solomon, 1996); second, its feasibility must be determined using economic factors, such as price, size or capacity (Schiffman and Kanuk, 2000). This approach was reinforced by the definition of several sequential processes of CDM that were the recognition of the opportunity, research and evaluation of alternatives, making the decision to purchase, and post-purchase evaluation (Bell, 2011; Boone and Kurtz, 2010).

Thus, several empirical studies were conducted using cognitive aspects to explain CDM. For instance, Al-Salamin and Al-Hassan (2016) pointed out the positive impact of pricing on consumer buying behaviour in Saudi Arabia with a significant difference between men and women towards odd pricing, while age, education, income had no effect. In European Union, consumer income had a significant impact on the purchasing decision of branded food products (Nes *et al.*, 2020). The result was confirmed by Hristov *et al.* (2022), studying socio-economic impacts on food purchasing behaviour in 13 European countries. A comparison between Sweden and Poland showed that consumer decisions could be explained by affordability (income) than sustainability but more weighted towards the first choice (Ozbun, 2021). In Finland, Kumpulainen *et al.* (2017) found that product type (meat, bread and vegetables) had an effect on local young consumers' pleasantness and probability to choose the product.

Product information, including price and labels, appeared to have great importance in influencing food consumption decisions. For instance, Kodali *et al.* (2013) found a positive impact of label elements (label design, nutritional information, health claims, accessibility, and quality). However, in Romania, consumers' distrust for sustainable labels and ecological products, and the European Union's food policy had a negative effect on consumption (Strambu-Dima, 2022). Unlike these results, labels appeared as neutral in case of Portuguese consumers. Gomes *et al.* (2017) reported that labelling would be more important to consumers if it was interpretative and based on symbols, colours, words or quantifiable elements.

A study conducted by Collier *et al.* (2023) tested the role of taste in explaining sensory expectations and its effect on making dairy consumption choices. The results revealed the role of rationalisation in shaping sensory expectations (taste) and making dietary choices.

Since 1990s, the second approach has been applied. Marketing has changed to involve direct communication with customers, and advertisers have begun to emphasize the significance of human emotions in CDM (Kotler *et al.*, 2010; Peter and Olson, 2010). McDonald (1998) defined emotions as a sensation triggered by a variety of stimuli, while thoughts are frequently involved in the elicitation of emotions. The two-aspect dualism still exists and is fully acknowledged in terms of both cognitive and emotional approaches (Foxall, 2007). While using an analogical emotion scale, Carrera and Oceja (2007) hypothesized the existence of several emotional states throughout CDM and proposed that emotions happened sequentially or simultaneously throughout CDM. Taylor (2008) reached the same conclusion.

Within the context of conventional CDM paradigm, Bell (2011) assumed that CDM emotions were sequential in character, with the final feeling being the most significant one. The author advocated that the evolution of emotions in CDM was reinforced by assumptions of consumer emotional intelligence (CEI). CEI suggested that multiple emotions occurred simultaneously, satisfaction/emotion dichotomies were rejected, and non-desirable decision outcomes of negative emotions were frequent. According to the author, the ability to deal frustration, self-awareness, self-discipline, persistence, empathy, and getting along with people are important skills of life. Then, Consumer Emotional Intelligence Scale (CEIS) was developed (Kidwell *et al.*, 2008). From CEIS, Kidwell *et al.* (2008) highlighted the following:

- Emotional ability extends CDM approach beyond traditional model limits.
- In a food choice task, there is a strong connection between CEI and food consumption.
- Individuals with low CEI are unable to resist products and services from well-known brands even at sub-standard qualities.
- In case of non-food products, only individuals with higher CEI made better choices.
- CEI is a predictor of compulsive consumption.

Empirically, researches used many aspects of emotions for providing advanced explanation and analysis of consumer behaviour, mainly in the food sector. For instance, in Italy, Cappelli *et al.* (2019) showed that brand had a positive and significant effect on willingness to pay for food (30%), compared to other goods (10%). In the United States, Choi (2016) demonstrated that sensory cues were related to arousal, pleasure and the desire to buy foods impulsively from mobile vendors during festivals and events. The colour psychology effect on rice consumer behaviour was tested in the United States and South Korea (Casas and Chinoperkwei, 2019), and it appeared to play a big role in emotional and intellectual influence among consumers. In addition, marketing research found that packaging was one of the most important factors influencing consumer buying behaviour through its elements: colour, packaging material, design of the wrapper, and innovation in consumers' purchasing decisions (Raheem *et al.*, 2014). Finally, Barrena *et al.* (2017) highlighted that emotions in terms of quality (hedonistic and nutritional), control, and brand were the key factors of novel food consumption decisions. The same conclusions were made by Silvestri *et al.* (2020) for beef traditional food.

However, about the third approach, conciliating the two precedent approaches, several researchers who went on to explain CDM in both cognitive and emotional ways simultaneously were not convinced by the idea that CDM

was either a cognitive or emotional phenomenon. Kotler *et al.* (2010) gave this orientation their full endorsement. The authors understood the need to shift from product and/or consumer-based marketing techniques to more comprehensive ones that targeted the individual, rather than just a customer. They advised developing cooperative, cultural, emotional and spiritual marketing techniques, within the internal (perception, motives etc.) and external (social and economic) elements that affected various CDM stages.

Empirically, numerous studies examined this concept; for instance, Li *et al.* (2015) used extrinsic factors related to sensory variables, such as brand and labelling, price, perceived satiety, and emotional impacts, to explain consumers' likings. In order to investigate impulsive purchasing, Perkov and Marinko-Jurčević (2018) used internal factors (age, gender, mood, income, or culture) and external factors (store's environment), both classified as affective and cognitive factors. A study conducted by Zinoubi (2021) found that local food consumption was substantially explained by health consciousness, intrinsic quality, and proximity, rather than local support and environmental awareness.

In this direction, the most valid combination of emotional and logical thinking stated that CDM of women differed from that of men. Indeed, Gundala *et al.* (2022) confirmed this conclusion for the US food consumers by demonstrating that men and women had different purchase intentions for organic foods. In addition, it was validated in Italy for Sicilian pizza consumption (Pappalardo *et al.*, 2019) through differences in sensory attributes, such as smell, appearance, and crunchiness. In Hungary, women consumed more coffee and dairy products than men, who consumed fewer healthy foods (Koroknay, 2021). Manipa *et al.* (2017) found that men revealed a general preference for low-calorie (LC) foods, compared to women.

In Saudi Arabia, Saleh *et al.* (2013) confirmed the role of gender, age and household income on consumers' purchasing responsiveness for free product samples at retail grocery stores. Benajiba (2020) pointed out a high correlation between frequency of consumption and positive attitudes among women towards the perception of sweetened soft drinks.

Accordingly, the present study had a mixed approach to explain CDM, which showed that it could be influenced by both emotional and cognitive factors.

Research Methodology

The present research used factor analysis and clustering procedures, which are the most common methods

used to examine the data collected from individuals. According to some researchers (Kawa *et al.*, 2013; Nasser and Makhous, 2019), the analysis must be conducted considering internal factors (perception, motives and learning) and external factors (social, economic and cultural).

The Principal Component Analysis (PCA) is a statistical technique. It has to reduce the dimensions of huge amount of consumer data with respect of their significant information (eigenvalue) and explain variability among the studied population. Second, the procedure converts linearly related variables that contain scattered data into unrelated orthogonal compounds and arrange it in a descending order according to the amount of variance expressed in eigenvalues.

After testing normality and correlation coefficients, which are conditions for applying PCA, the outcomes revealed some indicators, mainly the reliability (Cronbach's alpha) coefficient indicating the internal consistency of variables (Pallant, 2007). After that, the results used the Kaiser–Meyer–Olkin (KMO) coefficient and Bartlett's test to examine the quality of estimation and if the extent of the provided information was sufficient to explain the studied phenomenon. Then, the required coefficient of KMO superior to 0.7.

The results focussed on principal components (PCs) having eigenvalue > 1 and their variance. The first of these indicators highlighted the weight of the designed PC, which represented a group of arranged variables in determining the studied population behaviour, and the second indicator evaluated variance in percentage of total information provided about it. Finally, it provided cumulative variance to show the total information given by these principal components. In addition, the PCA provided the weights of variables arranged in each principal component.

In the second stage, the cluster analysis method was utilized to organise people's purchasing behaviours into groups. In statistics, this method constituted a set of tools and techniques used to group various objects into sets, where the similarity between two of them was greatest if they were members of the same group or minimal otherwise. More specifically, we used hierarchical clustering analysis, also known as clustering of clustering, to construct a dendrogram, which was a tree-like structure that demonstrated relationship between all data points in the system. Then, we organized groups of customers who behaved similarly during consuming.

The data were collected through a survey conducted with a sample of 280 people attended the international

exhibition of dates held in the city of Al-Ahsa, in the eastern region of the Kingdom of Saudi Arabia, from 15 December 2019 to 31 January 2020. The city has a tradition of hosting the exhibition every year. Thus, date consumption is not only a necessity but also a culture, because the oasis of Al-Ahsa has the world's largest area, including 30,000 farms containing 2.2 million palm date trees of 34 varieties and producing 1,20,000 tonnes of dates. In a nutshell, it is the only source of life in this vast desert.

The sample was chosen at random among the attendees of the dates' exhibition. In terms of gender, the sample included 62.8% women and 37.2% men. By nationality, it included domestic attendees (from Saudi Arabia), who made up about 86% of all visitors, while the remaining 14% were overseas visitors. In terms of age, 64.5% of those chosen for the sample were aged >40 years, with 57.9% being women. The majority of those interviewed were married, accounting for 198 people (70.7% of the total), with women accounting for 61.1% (121) individuals. The sample included 243 people (86.8%) who had at least a secondary-level education, 59.7% of whom were women, and at least 52.5% (147) who had a bachelor's degree, 79.1% of whom were women. The sample's economic status was dominated by 50% employees, 43% of whom are women, and 28.8% were unemployed (88.5% were women). For this reason, half of all the people (53.9%) in the survey earned more than US\$1334.

In order to define variables determining the CDM of purchasing behaviour, the present research firstly referred to the variables illustrated by McDonald (1998), who performed a factor analysis with 19 variables arranged into four factors (rationality, emotion, object and cognitive). For measuring these variables, the authors used Likert scales. Secondly, the research referred to Kawa *et al.* (2013), who identified cognitive and mental variables linked to dates' CDM. In comparison to the two previous studies (Kawa *et al.*, 2013; McDonald, 1998), the current study identified 28 emotional and cognitive variables that reflected five dimensions of consumer characteristics. These dimensions were socio-demographic (gender, education, age, family status, nationality, income, job, purchasing responsibility and address); geographic (purchasing place, why the purchasing place was chosen); economic (information, quantity, price, promotion, price evaluation); consumer taste (quality of dates, substitution of favourite dates, future consumption, and opinion about the festival); and marketing (form of package; packaging and storage dates; storage type; layering and category). The reliability test (Cronbach's alpha) confirmed the stationarity of only 17 variables, which are presented in Table 1, with related questions used in PCA.

Table 1. Some categories of variables and corresponding interview questions.

Category of variables	Questions	Multiples choice responses				
Socio-demographic	What is your gender?	Male	Women	–	–	–
Socio-demographic	What's your nationality?	Saudi Arabia	Non-Saudi Arabia	–	–	–
Socio-demographic	What is your professional state?	Employee	Retired	Unemployed		
Economic	What is your income level (US\$)?	<400	401–800	801–1333	1334–2667	>2667
Economic	Who is responsible for purchase of dates?	Father	Mother	Son	Daughter	Other
Geographic	Where do you live?	Town	Rural	–	–	–
Geographic	Where do you buy dates?	Near home	Market	Other	–	–
Brand	What type of dates do you consume (quality)?	Khlass	Shishi	Other	–	–
Information	How would you rate the matching of the packaging data to the content?	Very satisfied	Satisfied	Indifferent	Dissatisfied	Very dissatisfied
Economic	How many dates do you consume per week?	<1 kg	1–2 kg	>2 kg	–	–
Economic	Average purchase price of dates in kilogram (US\$ per kg)	<6.6	6.6–13.3	>14	–	–
Economic	When do you plan to purchase dates; do you ask price-promotion from seller?	Yes	No	–	–	–
Marketing	What is your opinion about packaging?	Very Excellent	Excellent	Indifferent	Poor	Very poor
Marketing	What is your opinion about storage?	Very Excellent	Excellent	Indifferent	Poor	Very poor
Marketing	What is your opinion about packing	Very Excellent	Excellent	Indifferent	Poor	Very poor
Marketing	What is your opinion about layering?	Very Excellent	Excellent	Indifferent	Poor	Very poor
Marketing	What is your opinion about category?	Very Excellent	Excellent	Indifferent	Poor	Very poor

Results

Normality test revealed normal distribution of the data, and all 28 consumer variables had significantly low correlations with one another, with the exception of a small number of marketing variables (packaging, storage, packing, layering and category), which had a high correlation. That being the case, we employed the PCA technique.

Reliability test (Table 2) based on Cronbach's alpha coefficient was the most common indicator of internal consistency (Pallant, 2007). An ideal coefficient value is 0.7 (Hair *et al.*, 2009). In the present study, Cronbach's alpha for the selected 17 scale items ($N = 205$) was 0.622, which was acceptable and showed that the buying motivation

scales had a satisfactory level of internal consistency and deemed statistically reliable.

The main PCA results retained were: (1) KMO extraction rotation F score; (2) initial correlation and signification (SIG) score; (3) plot eigenvalue rotation; and (4) extraction PC score. We observed that filtration of the 24 initial variables through the Cronbach's alpha test led us to conduct PCA analysis for only 17 variables (gender, nationality, age, education, job, income, taste-consumption, price, price offered, substitution of favourite date, storage-type, packaging, storage, packing, layering, category, and future consumption). The PCA identified two principal components, including seven variables, as analysed below.

Bartlett's test of sphericity and the KMO measure of good reliability were applied to examine the suitability of factoring the data. The determined KMO was 0.845 (Table 3), and the Bartlett's test revealed significant sphericity at $p < 0.05$.

Table 2. Reliability statistics, Cronbach's alpha test.

Cronbach's alpha	Number of items
0.622	17

Table 3. KMO and Bartlett's test.

KMO and Bartlett's test		Value
Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy		0.845
Bartlett's test of sphericity	800.950	927.672
	21	36
	0.000	0.000

The two findings demonstrated that the data were roughly multivariate normal and did not represent identity matrix (data differed significantly from identity matrix). Therefore, these data were appropriate for factor analysis (Mor and Sethia, 2015; Tabachnick and Fidell, 2007).

According to correlation matrix, the variables that define marketing activities (packaging, storage, packing, layering and category) were positively correlated to one another but negatively to other variables, such as gender and job, except for job and package. It entailed that these variables were homogenous and belonged to the same group. Gender was negatively correlated with marketing variables but not with jobs. This correlation had a significant meaning in terms of gender differences in CDM. It indicated that women had different feelings about marketing outcomes than that of men, so the attraction to a product based on its marketing presentation decreased from women to men. Job variable had a negative correlation with marketing variables, except package, and it had a positive correlation with other variables, such as gender. Table 4 shows correlation matrix for different variables.

The statistics of total variance are explained in Table 5, highlighting the initial eigenvalues of principal components and the percentage of variance explained by each component along with the cumulative value. Eigenvalues represented the weight attributed to each component that varied from maximum weight (3.682), which indicated the most important component explaining variance in consumer behaviour towards dates, to minimum weight (0.220). For each component and its related

eigenvalue, the percentage of variance highlighted the share of variability that could be explained by the component. Moreover, the extraction sums of square loadings indicated retained principal components, for which eigenvalues were greater than 1. For the present case, two principal components were extracted to explain 72.53% of total variance (as per the information contained in the seven initial components).

The first principal component accounted for 51.7% of the total variance, while the second accounted for 20.83%. Consequently, cumulative variance explained by the two components accounted for 72.53% of the total variance of the sample.

The scree plot in Figure 1 shows that point 2 represents the point of reflection for which the eigenvalue is more than 1. The next point is cited at a level lower than 1, which meant that components over number 2 explained little variation in the studied population. We accepted the two components because the eigenvalue was closer to 1.

According to the findings (Table 6), results confirmed the theory assumption concerning marketing variables, such as package, storage, packing, layering and category, influencing principal component 1 (PC1). Their respective correlation coefficients with PC1 were 0.753, 0.852, 0.874, 0.880 and 0.874. As a result, PC1 was a marketing component (MC), explaining 51.7% of the total variance. Marketing activities are identified as follows:

- Packaging*: Design of the package and its colour appeared important in marketing strategy. Packaging influences women's purchasing decisions, and they place greater emphasis on the design and colour of the package.
- Packing* is the fourth determinant of marketing strategy. Its significance stems from the fact that it makes date products more appealing to buyers.
- Storage* is the fifth marketing function. It is important because it retains the quality of the product.

Table 4. Correlation matrix.

	Gender	Package	Storage	Packing	Layering	Category	Job
Gender	1.000	-0.042	-0.218	-0.163	-0.157	-0.158	0.426
Package	-0.042	1.000	0.605	0.531	0.581	0.595	0.014
Packing	-0.163	0.531	0.703	1.000	0.756	0.716	-0.088
Storage	-0.218	0.605	1.000	0.703	0.653	0.659	-0.064
Layering	-0.157	0.581	0.653	0.756	1.000	0.747	-0.089
Category	-0.158	0.595	0.659	0.716	0.747	1.000	-0.071
Job	0.426	0.014	-0.064	-0.088	-0.089	-0.071	1.000

Table 5. Total variance explained.

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1.	3.682	52.606	52.606	3.682	52.606	52.606	3.619	51.694	51.694
2.	1.395	19.924	72.530	1.395	19.924	72.530	1.459	20.836	72.530
3.	0.580	8.283	80.814	–	–	–	–	–	–
4.	0.502	7.178	87.992	–	–	–	–	–	–
5.	0.354	5.052	93.043	–	–	–	–	–	–
6.	0.265	3.786	96.830	–	–	–	–	–	–
7.	0.222	3.170	100.000	–	–	–	–	–	–

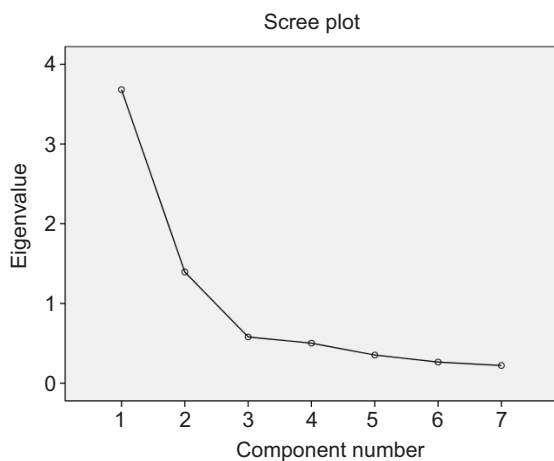


Figure 1. The scree plot.

Table 6. Rotated component matrix.^a

	Components	
	1	2
Gender	–	0.801
Package	0.753	–
Packing	0.874	–
Storage	0.852	–
Layering	0.880	–
Category	0.874	–
Job	–	0.835

Note: ^aRotation converged in five iterations.

The type of storage appears more important than the storage itself in determining consumer behaviour.

- (d) *Layering* received the highest score in PC1, indicating that it plays an important role in motivating purchase of dates. Thus, layering is a marketing function that involves arranging products in the order of size, taste, maturity and so on to increase

their visibility for consumers and influence their purchasing decisions. Sellers use this operation frequently for agricultural products, mainly dates. Any effective marketing strategy must consider the importance of layering in influencing consumer behaviour.

- (e) *Category*: Product categorisation is the second most important determinant of consumer behaviour, affecting product differentiation (quality and price).

The second principal component (PC2) could be called “employed women” because, as stated in the results, PC2 is determined by gender and job. The correlation coefficients between PC2 and its respective determinants are 0.801 and 0.835. The findings support the theoretical expectation, revealing that men and women have different buying patterns, such as in the United States for organic food (Gundala *et al.*, 2022); in Italy for Sicilian pizza consumption (Pappalardo *et al.*, 2019); in Hungary for coffee, dairy products and health foods (Koroknay, 2021); in Mexico for low-calorie food (Manippa *et al.*, 2017); and in Saudi Arabia for sweetened soft drinks (Benajiba, 2020). According to the survey, on average, more women preferred dates, compared to males. Indeed, 89.7% of women buy more than 1 kg of dates per week, compared to only 42% of men. Furthermore, approximately 60% of the polled respondents stated that women were responsible for purchasing foods, particularly dates, compared to only 16% responders, who stated that men were responsible for purchasing foods, and the remainders made no declaration. Another reason that supported the findings was that the majority of visitors to the exhibition were women (62.5% of the total visitors), while men accounted for 37.5% of the total visitors.

These findings could be explained by the fact that women in Saudi Arabia are living in a new era of consumerism and modern lifestyle. Their preferences have shifted, compared to previous decades, due to increase in their education levels. The government encourages women to

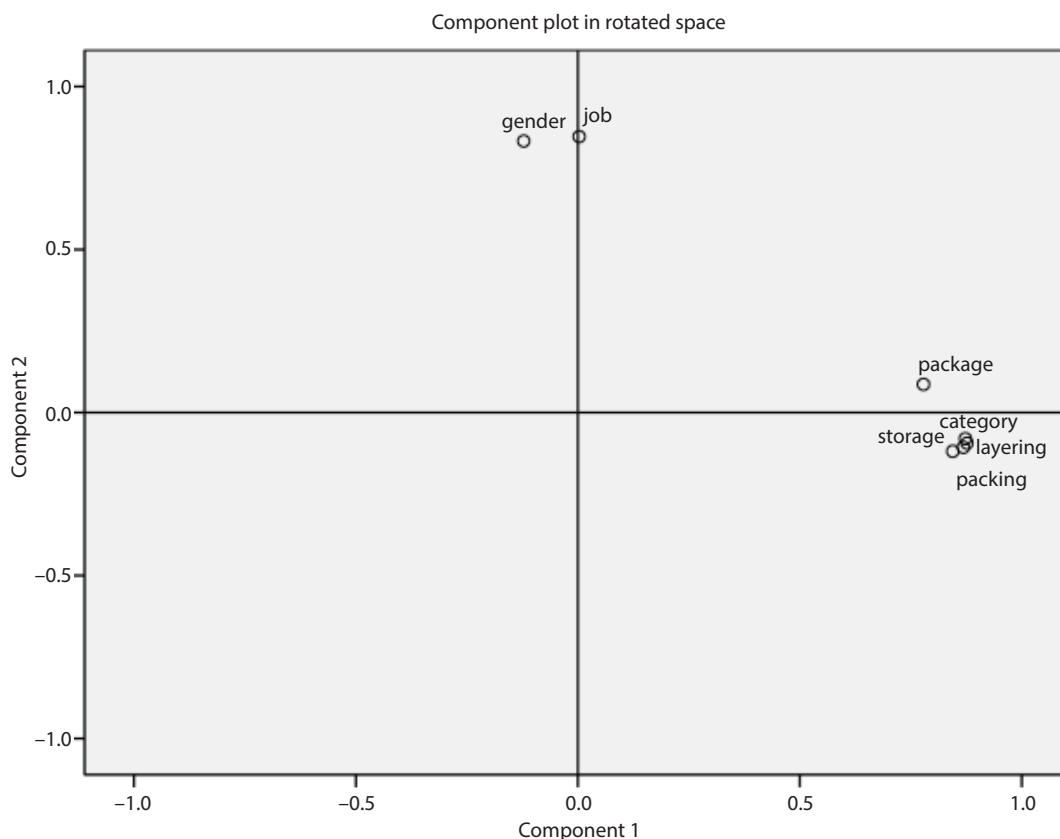


Figure 2. Component plot in rotated space.

travel abroad, encouraging them to habitat and imitate with other women in developed countries, particularly in the United States, the United Kingdom, and European countries, in general, these being their favorite places to visit on a regular basis. Women in Saudi Arabia enjoy entertainment, shopping, and spending on their well-being, especially if they are earning, thus becoming more independent in their choices and preferences. In addition, this last argument details the extent women's jobs play in owning their income and explains whether working women with jobs could influence the purchase of more dates through a typical CDM process when women as a gender variable is when combined with their job.

As a result, variability in the population is explained by gender and job as second important variables providing information about CDM; this is known as the employed women principal component (EWPC) and accounts for 20.8% of total variance. Therefore, employed women constitute a valuable customer assemble for producers and traders. Taking into consideration the first PC1, which pointed out the role of marketing of dates, it was designed to respect women's desires.

Basing on PC1 and PC2 results, the clustering analysis helps to identify the possible segments of the market.

The dendrogram has three levels (Figure 3). At the first level, classification yields two clusters. Cluster A is distinguished by its small size, with only two consumers whereas there are 233 people in cluster B. The second level of clustering process, cluster B, appeared as heterogeneous; it was split into two groups (B1 and B2). B1 group had 185 people, while B2 group had 48 people. At the third level, both groups B1 and B2 were subdivided into two subgroups. Cluster B1 is further subdivided into B11 (62 consumers) and B12 (123 consumers). Concerning cluster B2, it was further subdivided into subgroup B21 (27 consumers) and subgroup B22 (21 consumers). Cluster A remained unchanged.

The dataset description permits a better understanding of the clustering results and descriptive statistics of variables used in the analysis. Table 7 provides a list of variables used in clustering that constitute PC1 (packaging, packing, storage, layering and category) and PC2 (gender and job). Statistics includes a simple size (N) showing the size number as 280, while the analysis presents some missing values. The mean and median showed that the number of women was greater than the number of men. Concerning standard deviation and quartiles, it highlighted the distribution of data, which indicated, in general, dissatisfaction of consumers with marketing measures.

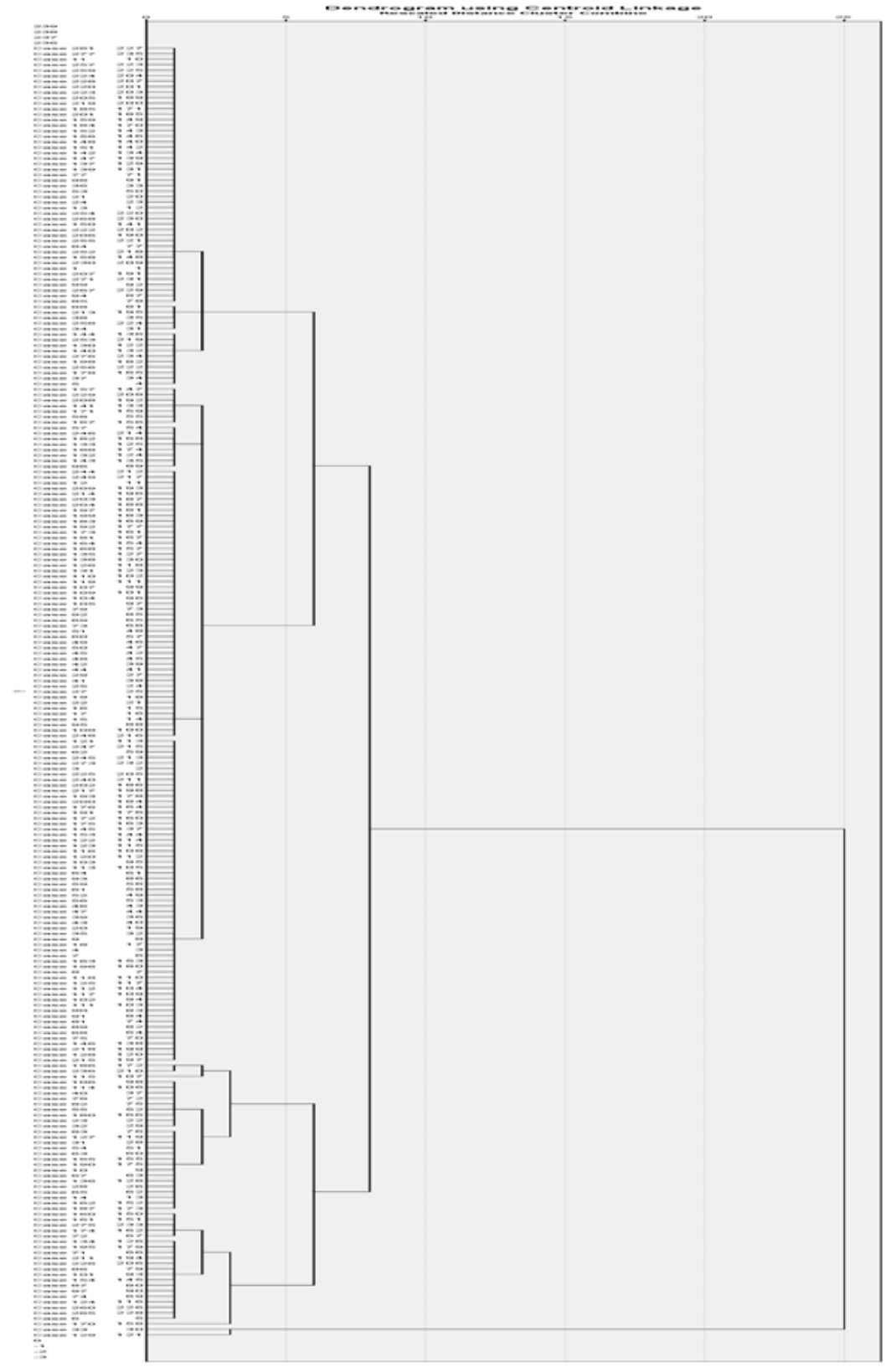


Figure 3. Dendrogram using centroid linkage: rescaled distance cluster combine.

Table 7. Description of the dataset.

		Gender	Job	Package	Packing	Storage	Laying	Category
N	Valid	280	270	268	266	267	266	246
	Missing	0	10	12	14	13	14	34
Mean		0.37	1.34	1.76	1.74	1.66	1.72	1.72
Median		0.00	2.00	2.00	2.00	2.00	2.00	2.00
Std. Deviation		0.484	0.976	0.467	0.533	0.541	0.512	0.512
Minimum		0	0	0	0	0	0	0
Maximum		1	4	4	2	2	2	2
Percentiles	25	0.00	0.00	2.00	1.75	1.00	1.75	1.00
	50	0.00	2.00	2.00	2.00	2.00	2.00	2.00
	75	1.00	2.00	2.00	2.00	2.00	2.00	2.00

Concerning cluster mean value, Table 8 shows the main characteristics of clusters. Finally, the clustering showed at level three of the process the following five groups:

Group A comprising two consumers, of which 50% were women. Both were unemployed and were either satisfied (50%) or neutral (50%) towards marketing measures (packaging, storage, packing, layering and category).

The second group was B1, comprising 185 people, of which 65.9% were women. Only 47.6% of this group were employed (46.1% of the total women were employed). The dissatisfaction rate with marketing measures was the highest, that is, up to 70.4%. This group was split into two subgroups: the first subgroup was B11, composed of 62 people, of whom 59.7% were women. Its rate of employment was about 48.4% (48.1% of the total women in this subgroup), the highest rate compared to other groups. It clearly appeared that up to 67.7% of consumers in this group were dissatisfied with marketing measures, with the proportion of dissatisfaction being packaging (66%), packing (74.2%), storage (62.9%), layering (69.4%) and category (66.1%). The subgroup B12 involved 123 people, including up to 71.5% women. Employed persons in this subgroup were 47.2% of the total (employment rate of women in the group was 45% of the total number). The global rate of dissatisfaction with marketing measures was 71.7%, with the respective proportion of dissatisfaction being 78.9% for packaging, 72.4% for packing, 65% for storage, 70.7% for layering and 71.5% for category.

The third group was B2, comprising 48 individuals, of whom 41.7% were women. The employed people represented 50% of the group because of the high number of men (the employment rate for women in this group was 35%). The survey showed that consumers in this group were more satisfied with marketing measures, compared to consumers in group B1, with the following

proportions: packaging (72.9%), packing (72.9%), storage (62.5%), layering (68.4%) and category (56.2%). Group B1 was further divided into two subgroups: B21 and B22. Subgroup B21 had 27 individuals: 63% being women and 37% men. The employment rate in this group was 48.1% (38.5% women were employed). The satisfaction of consumers with marketing measures was 67.4%, higher than the two groups cited above, with measure-wise satisfaction being, packaging 74%, packing 70.4%, storage 59.2%, layering 70.4% and category 63%. Subgroup B22 had 21 individuals, of which 52.4% were women. The employed people represented 52.4% of the total subgroup, with employed women being 28.5% only. The group had the highest satisfaction rate towards marketing measures, compared to all other groups: the dissatisfaction rate was 66.7%. Marketing measures satisfaction proportions were: packaging 72.9%, packing 72.9, storage 62.5%, layering 68.4% and category 56.2%.

Discussion

According to the findings, women were more often to purchase dates, compared to men, with significant gender differences in various elements of motivation (Alshamari *et al.*, 2019) and for odd-pricing strategy (Al-Salamin and Al-Hassan, 2016). This implied that marketing activities had a greater influence on women's purchasing decisions. Even though the study examined several social variables, such as age, education and status, gender was the only social variable that influenced CDM behaviour. A similar result (Ohen *et al.*, 2014) discovered that age, marital status and educational level had no significant effect on the frequency of monthly purchases. Consequently, the present study confirmed that emotions influenced women's purchasing decisions, while cognitive factors had opposite effects. The hypothesis proposes that music, brands, feelings, colour, decoration and other factors influenced women's purchasing decisions. On the other hand, men

Table 8. Cluster mean values.

Characteristics		Cluster A	Cluster B1			Cluster B2			Total
			B11	B12	B1	B21	B22	B2	
Total number of consumers		2	62	123	185	27	21	48	235
Gender	Men	50%	40.3%	28.5%	30.9%	37%	47.6%	41.7%	84
	Women	50%	59.7%	71.5%	69.1%	63%	52.4%	58.3%	151
Job	Employed total	0%	48.4%	47.2%	47.6%	48.1%	52.4%	50%	112
	(women %)		(48.1%)	(45%)	(46.1%)	(38.5%)	(28.5%)	(35%)	
	Others	100%	51.6	52.8	52.4%	51.8%	47.6%	50%	123
Opinion of consumers about marketing measures	Consumers dissatisfied	0%	67.7%	71.7%	70.4%	67.4%	65.7%	66.7%	69.4%
	Neutral consumers	50%	28.8%	20%	22.9%	21.5%	34.3%	32.2%	25.2%
	Consumers satisfied	50%	3.5%	8.3%	6.7%	11.1%	0	1.1	5.4%
Package	Consumer dissatisfied	0%	66%	78.9%	74.6%	74%	71.4%	72.9%	73.6%
	Neutral consumers	50%	30.8%	0%	0%	26%	28.6%	27.1%	13.2%
	Consumers satisfied	50%	3.2%	23.6%	16.7%	0	0	0	13.2%
Storage	Consumer dissatisfied	0%	62.9%	65%	64.3%	59.2%	66.7%	62.5%	63.8%
	Neutral consumers	50%	32.9%	30.9%	31.4%	40.8%	33.3%	37.5%	32.8%
	Consumers satisfied	50%	4.8%	4.1%	4.3%	0	0	0	3.4%
Packing	Consumer dissatisfied	0%	74.2%	72.4%	73%	70.4%	76.2%	72.9	72.8%
	Neutral consumers	50%	22.6%	20.3%	21.1%	25.9%	23.8%	25%	21.2%
	Consumers satisfied	50%	3.2%	7.3%	5.9%	3.7%	0	2.1%	6%
Layering	Consumer dissatisfied	0%	69.4%	70.7%	70.3%	70.4%	66.7%	68.4%	69.8%
	Neutral consumers	50%	27.4	25.2%	25.9%	25.9%	33.3%	29.5%	26.4%
	Consumers satisfied	50%	3.2%	4.1%	3.8%	3.7%	0	2.1%	3.8%
Category	Consumer dissatisfied	0%	66.1%	71.5%	69.7%	63%	47.6%	56.2%	66.8%
	Neutral consumers	50%	30.7	26.1%	27.6%	37%	52.4%	43.8%	31.1%
	Consumers satisfied	50%	3.2%	2.4%	2.7%	0	0	0	2.1%

make purchasing decisions based on price, specification and logical payoff.

The other way, job appeared influential in purchase decision-making. For instance, the present study suggests three professional domains for polled participants: employed, retired and unemployed. According to findings, employed individuals buy more than retirees or unemployed persons. This means that employed people preferred dates than others. Given that job is associated with gender in PC2, job appears as a factor in classifying women as purchasing decision makers. The significant attribution of date-purchasing decision to employed women was confirmed by the research conducted by Xaba and Dlamini (2021), which found that being employed was a significant factor.

In the Al-Ahsa region, the present study proved that consumer behaviour was an intricate, dynamic complex of cognitive and emotional processes. Thus, women's emotional behaviour influenced a large part of their date-purchasing decisions, and women never increased their

date purchases unless they were motivated and enticed by product design: packaging, packing, storage, layering and categorising. Consequently, dates' market segmentation becomes a necessity for the industry's development. In its optimal step, clustering results highlight the following five clusters:

Cluster A: Consumers, with about half being unemployed women, interested in lowest price

It is distinguished by its small size, with only two consumers (0.8% of the surveyed people). One of those was an unemployed woman with no income. Members are not motivated by marketing measures and are only interested in the best deal. They attempt to purchase exactly the quantity that satisfies their needs.

Cluster B: Consumers, with most being employed women, interested in marketing motivation

This cluster was composed of about 99.2% of surveyed people. The second level of clustering showed that this

cluster was inconsistent, and it was divided into two sub-clusters: B1 and B2.

Sub-cluster B1: Employed women are less satisfied by actual marketing motivation

This included 185 consumers, of whom women represented 65.9%; 47.6% of the participants were employed women. For them, consumption of dates was maximum of all other groups. Customers who were enticed by marketing motivation factors bought dates regardless of price. However, 70.4% of them were dissatisfied with marketing measures (i.e. packaging, packing, storage, layering and category) provided by sellers. Consumption of dates in this sub-cluster grew in case consumers were motivated by marketing measures. This group included two other subgroups, which differed by the number of employed and dissatisfaction rate, as follows:

Sub-group B11: It was composed of 67.7% dissatisfied consumers, the highest portion of employed women when compared to the other 48.1%.

Sub-group B12: It involved maximum number (71.7%) of dissatisfied consumers, with up to 71.5% women, having an employment level of 45%.

Sub-cluster B2: Fewer employed women were more satisfied by actual marketing motivation

This sub-cluster involved 50% employed consumers but with less remuneration than those of sub-cluster B1. Women represented 41.7% of the group, of which only 35% were employed. Consumers were more satisfied with marketing measures than those in sub-cluster B1. As a result, their purchasing decisions were based on the sale price, and were usually looking for a promotional scheme. Because consumers in this group were satisfied with the minimum level of marketing motivation, consumption quantity won't increase unless sellers make a price offer. The group was further divided into two subgroups: B21 and B22.

Sub-group B21: It included 63% women and 37% men. Employment rate in this group was 48.1%, with a higher female employment rate of 38.5%. Hence, the satisfaction rate with marketing measures was high (67.4%).

Sub-group B22: This sub-group involved 52.4% women but had the lowest employment rate at 28.5%. The group had the highest satisfaction rate towards marketing measures, compared to all other groups; the dissatisfaction rate was 66.7%.

According to the findings, the gender segmentation marketing strategy of dates' consumers in the Al-Ahsa region of Saudi Arabia was significant and relevant to marketers and advertisers targeting wealthy women. Altawail (2003) discovered similar results for female Saudi Arabian shoppers for personnel needs. In the present study, pink marketing was identified as a strategic axe.

Finally, the present research directed to investigate the determinants of behaviour of consumers of dates and segmentation of the market in the Al-Ahsa region of Saudi Arabia. Authors used a methodology in two stages: the first being PCA, and the second was clustering. These were applied by collecting data of 280 individuals. Main finding of the PCA highlighted variables that influenced consumer behaviour as follows:

- (1) Marketing motivation: It composed the first principal component that determined consumer behaviour (51.7%). Variables were storage, packaging, packing, layering and categorising.
- (2) Employed women: It compiled the second principal component that determined consumers' purchasing decision (20.83%). Variables were gender and job.

Based on these results, clustering analysis discovered the following three main consumer clusters:

- (a) Cluster A: Consumers, with about half being poor or unemployed women, were interested in the lowest price.
- (b) Cluster B: Consumers, with maximum of wealthy women, were interested in marketing motivation. This cluster had the following sub-divisions:
 - (i) Sub-cluster B1: Wealthy women were less satisfied by actual marketing motivation.
 - (ii) Sub-cluster B2: Fewer wealthy women were satisfied by actual marketing motivation.

Conclusions

The present study investigated key factors influencing purchasing decisions of consumers about dates. The study categorised consumers into clusters in order to develop a market segmentation strategy. Principal components analysis and clustering processes were used comprising a sample of 280 consumers visiting the Alahsa Forum of Dates for this purpose. The PCA results highlighted two principal components. The first was the marketing plan based on packaging, packing, storage,

layering and categorising. The second component was employed women, who were dressed according to variables of gender and income. The results of clustering pointed to the following three groups of consumers:

- First group in which half were unemployed women interested in the lowest price (required price reduction).
- Second group comprised more employed women, less satisfied by actual marketing motivations (required amelioration in marketing operations).
- Third group of less employed women, satisfied by actual marketing motivations (never required amelioration in marketing).

The present study recommended the development of the dates industry through a marketing strategy based on a segmentation of dates markets, respecting different groups of consumer characteristics. It must focus on women who are able to increase their consumption and pay more. Traders and producers should offer well-packaged products in well-designed packaging with more attractive colours (producer should be connected to pink marketing).

The study's limitation was the inclusion of sample of men whose behaviour was similar to those of unemployed women. The future research should select samples comprising women only to improve results and orient segmentation according to women's purchasing decisions by education, age and other intervening variables.

Acknowledgement

The research was funded by Deanship of Scientific Research, King Faisal University (KFU), Saudi Arabia; project grant No. 2850 (2023).

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