PERCEIVED NUTRITIONAL AND MEDICINAL VALUES OF DATE PALM *(Phoenix dactylifera)* AMONG RURAL DWELLERS OF KATSINA STATE, NIGERIA

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ABSTRACTS

The study investigated perceived nutritional and medicinal values of date palm (Phoenix dactylifera) among rural dwellers of Kastina State, Nigeria. A total of 90 rural households were sampled in the state. Data were analyzed using both descriptive and inferential statistical tools. Study reveals that respondents' average age was 36.0±16.1 years as 34.4% were aged between 31 and 40 years. Majority (93.3%) were Muslims, while 64.4% were married with an average household size of 11 members. About 50% had Quranic education. A large number had consumed date palm before in both fresh (91.1%) and dry forms (64.4%). This may be due to high level of awareness of the various functional values of date palm as majority were aware of the various functional values. Overall levels of awareness of both nutritional (71.1%) and medicinal (53.3%) values of date palm were also high among majority. Also, 56.7% and 64.4% of the respondents had favourable perception towards medicinal and nutritional potentials respectively of date palm. Level of exposure to information (r=0.410 and 0.578) and level of awareness (r=0.504 and 0.409) had significant relationship with respondents' perceived nutritional and medicinal values of date palm respectively. The study concludes that information and awareness were proven sine qua non for favourable perception of functional values of date palm among rural dwellers in Kastina state.

INTRODUCTION

Phoenix dactylifera also known as date palm is one of the oldest subsistence cultivated crops mainly grown in the hot arid regions of the world. The plant can also thrive in an oasis setting because of water availability for the roots to soak up. It grows tall and produces sweet fruits known as date. The tree is believed to have originated from Africa and Asia (Zaid and Wet, 1999) but can be found today growing in Mexico, Chile, India, Italy, Spain, and South-western United States. Egypt (1.3m MT), Iraq (0.4m MT), Iran (1.0m MT) Qatar (0.02m MT), Pakistan (0.6m MT), Algeria (0.5m, MT), Saudi Arabia (0.9 MT), China (0.1), Oman (0.2m MT) and Libya (0.1m MT) are top producers with Egypt being the largest World producer followed by Iran and Saudi Arabia with annual production rates of 1,326,000MT, 1,000,000MT and 982,000MT respectively (FAO, 2008; Dada, Nwawe, Okere and Uwubanmwen, 2012). These same sources further revealed that in West Africa sub region, Mauritania is reportedly the highest producer, followed by Chad and Niger with annual production statistics of 22,000MT, 15,000MT and 8,000MT respectively.

Although date palm is believed to have been introduced into Nigeria in the early 17th century by the Arab traders from North Africa and Muslim pilgrims to Mecca and Medina (Omamor, Aisagbonhi, and Oruade, 2000) yet it can be found growing extensively and commercially in the arid zones of northern Nigeria (Kaduna, Katsina, Kano, Sokoto, Kebbi, Zamfara, Jigawa, Yobe, Borno, Gombe and Bauchi States) and in the lower latitudes within the derived savanna areas of Plateau; Nasarawa, Niger, Kwara and Benue States (AbdulQadir, Garba, Eseigbe and Omofonmwan, 2011).

It is propagated by seed, off-shoot and tissue culture (AbdulQadir *et al,* 2011). Date palm is a dioeciously perennial plant that takes about four years to fruit depending on the agronomic practices.

The relatively wide spread cultivation of date palm may have been necessitated by its numerous nutritional and health potentials and values. FAO (1982) found that date palm can be used in making local fan, ropes, baskets, foot mats, bags, beds, bird cages, traps, blankets, and chairs, cushion, doors, window frames, fences, fire wood, life belt as well as providing employment to both skilled and unskilled labour, thereby generating income and alleviating poverty. FAO further revealed that as a desert plant, it serves a useful purpose of shade provision to desert travelers, as wind breaks; checks wind erosion and desert encroachment particularly in the northern parts of Nigeria.

Nutritionally, AbdulQadir *et al.* (2011) found out that date has more than 3000 calories/kg consisting of 70% carbohydrate (mostly invert sugar e.g. glucose and fructose) which is good for persons who cannot tolerate sucrose. The source further stated that it contains reasonable amount of potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), copper (Cu), zinc (Zn), manganese (Mn) and very low quantities of silicon (Si), sulphur (S) sodium and fat. Also found in moderate quantities are chlorine (Cl), sodium (Na) and phosphorus. The iron content of date is almost a third the recommended dietary allowance for an adult male and these form the basis for date's description as a wonderful delicious fruit (Dada *et al* 2012) and as 'a mine' in itself (Zaid and West, 1999).

It has also been uncovered that date is a major source of health benefitting flavonoid polyphenolic antioxidants known as Tannins that has anti-infective, anti- inflammatory and anti-hemorrhagic (Dada *et al* 2012). This source reiterated that its vitamin A content is known to have antioxidant properties that are essential for vision, maintaining healthy mucus membrane and skin, protects the lungs and oral cavity cancers, prevents colon, prostate, breast, endometrial, lung and pancreatic cancers. Its iron content is a major component of hemoglobin and this is known to determine the oxygen carrying capacity of the blood. Also its potassium richness is an important cell and body fluid that assist in controlling the heart rate and blood pressure, thereby offering protection against stroke and coronary heart diseases (Dada *et al* 2012). On the other hand, the high tannins content is good medicinally as a detersive (having cleaning power) and astringent in intestinal trouble (Wikipedia, 2011). It can be used to treat sore throat; cold, bronchial catarrh and fever. Wikipedia (2011) further observed its efficacies in counteracting alcohol intoxication and in diarrhea and genitor-urinary ailments' treatment. The seeds when soaked in water can be fed to horses, cattle, camel, sheep and goat while the dried and ground up can be included in chicken feed (Morton 1987). Darby, Ghalioungi and Louis (1977) and Manniche (1989) had earlier listed the medicinal values of date to include: remedy for swelling of any limb, swollen and aching legs, cough in children, worms, heat of the heart, sneezing, hair growth, and used in mummifying corpses (Lucas and Harris, 1962; Darby *et al,* 1977; Nazir, 1970).

It is therefore interesting that consumption of date in Nigeria as observed by Dada *et al.* (2012) has been massive and reasonably outstripped local production which Omoti and Okolo (2000) noted is at subsistence level. Perhaps the massive rate of consumption and unequal rate of production warranted the importation of most dates consumed in Nigeria from neighboring countries like Chad, Niger and Sudan (Adesiji, Olujide, Bolarin, Sanusi, and Komolafe, 2013). Its production rate however, raises doubt on the awareness and perception of the populace over the numerous values of date palm. One had expected that date palm's values and consumption rate should have necessitated a robust production level in Nigeria. It is against this concern that the study examined rural dwellers' perception on the nutritional and medicinal values of *Phoenix dactylifera* (date palm) in Katsina State, Nigeria. Specifically, the study:

1. examined the socio-economic characteristics of the respondents
2. identified respondents' sources of information on the nutritional and medicinal values of date palm
3. determine respondents' awareness on nutritional and medicinal values date palm
4. describe respondents' perception on the nutritional and medicinal values of date palm

METHODOLOGY

The study was carried out in Katsina state. Katsina State is located in the North-Western region of Nigeria. The state, covers an area of 23,938 sq. km and is located between latitudes 11Â°08'N and 13Â°22'N and longitudes 6Â°52'E and 9Â°20'E. The state is bounded by Niger Republic to the north, by Jigawa and Kano States to the east, by Kaduna State to the South and by Zamfara State to the West. Katsina State has rich cultural values with annual rainfall ranging from 800m to 1000mm.

Katsina State has a total of 34 LGAs, out of which about 16 are rural. Therefore, the 16 rural LGAs were purposively selected for the study. Of the 16 LGAs selected, a total of 3 LGAs (25%) were selected through a simple random sampling technique. These are Kaita, Ingawa and Maidua. The third stage involves random sampling of 6 communities in the LGAs selected. A total of 90 rural households were then sampled proportionately across the 6 communities.

A structured interview schedule containing questions ranging from the respondents' socio-economic characteristics, sources of information, awareness and perception on the nutritional and medicinal values of *date palm* was used to collect data for the study. Frequency of accessing information were measured as respondents indicated whether it was always (3), occasionally (2), rarely (1) or never (0). Awareness of the nutritional and medicinal benefits of *date palm* was also determined as respondents indicated if they were aware (1) or not aware (0) for each of the awareness statements. For perceived nutritional and medicinal benefits of *date palm*, a five-point Likert-type scale was used to assess respondents' level of agreement to each of the medicinal and nutritional values of *date palm*. A score of 5, 4, 3, 2 and 1 was assigned to each strongly agree, agree, undecided, disagree and strongly disagree, for positively worded statements and a reverse for negatively worded statements. A score of each of sources of information, awareness and perceived benefits was computed, and used for testing the hypotheses involving these variables. The mean awareness of the benefits of *date palm*, as well as their perceived benefits were obtained and used to categorize respondents level of awareness and perceived benefits into high and favourable ($\geq$ mean score) and low and unfavourable ($<$ mean score) respectively. Frequency counts, percentages and means were used in describing the data, while Chi-Square and PPMC were used to test the

hypotheses. The methodology was adopted from Ikwuakam, Sangotegbe and Akinbile (2014).

RESULTS AND DISCUSSION

Socioeconomic characteristics

Table 1 presents the socio-economic characteristics of the respondents wherein their average age was 36±16.1 years as 34.4% were between the ages 31 and 40 years. It could therefore be inferred that most of the respondents were young. Also 74.4% of the respondents were male, indicating the male headed nature of most households in the area as earlier observed by Ikwuakam, *et al.* (2013). The study further shows that majority (93.3%) were Muslims, 64.4% of them were married, while most (25.6%) have household size of between 9 and 12 people, with mean household size of 10.8±7.6 which suggests that the respondents had large household size in the area. The finding on the marital status corroborates the findings of Ayanda, Akangbe, and Fakaya (2010), Suleiman (2010), Adesiji, Olujide, Bolarin, Sanusi and Komolafe (2013) who reported similar higher percentage values for married respondents in the same geographical location. The large household size may also be due to polygamous type of marriage that obtains in most Muslim dominated areas of Northern Nigeria (Adesiji *et al.,* 2013). It was also revealed that 90.0% of the respondents were Hausas with majority (49.9%) having Quaranic education, while those with formal education attainment of primary, secondary and tertiary level were 28.9%, 13.3% and 7.8% respectively. This suggests that most of the respondents had no appreciable level of formal education, depicting the possibility of preference for and adherence to traditional remedies. Other facts revealed were that 91.1% of the respondents consumed date palm. A large number (64.4%) consumed date palm dried (Figure 1), while 30.0% of them had consumed it for a period of 10 years (Figure 2). Date palm has a lot of religion connotation both in the old world where it originated and the new world where it migrated to like Nigeria (FAO, 2002) and in Muslim dominated northern Nigeria, date palm is used to breakfast (Gbolagade *et al.,* 2013). The result further revealed that majority (87.8%) source the date palm they consume from the market, implying its availability in the study area. Erskine, Moustafa, Osman, Lashine, Nejatian, Badawi and Ragy (2003) had noted that dates are traditionally marketed all over the world as a highly valued confectionary and Katsina state falls within the arid region of northern Nigeria where date palm are grown extensively and in commercial quantity (Dada *et al.,* 2012).

Table 1: Socio-economic characteristic of the respondents

Variable	F	%	Mean ± SD
Age:			
≤20	12	13.3	35.98 ± 16.08
21-30	22	24.4	
31-40	31	34.4	
41-50	10	11.1	
51-60	7	7.8	
> 60	8	8.9	
Sex:			
Male	67	74.4	
Female	23	25.6	
Religion:			
Christianity	6	6.7	
Islam	84	93.3	
Marital status:			
Married	58	64.4	
Single	22	24.4	
Divorced	2	2.2	
Widow	8	8.9	
Household size:			
1-4	20	22.2	10.79 ± 7.63
5-8	19	21.1	
9-12	23	25.6	
13-16	11	12.2	
>16	17	18.9	
Ethnic group:			
Hausa	81	90.0	
Yoruba	2	2.2	
Igbo	2	2.2	
Others	5	5.6	
Education attainment:			
Primary education	26	28.9	
Secondary education	12	13.3	
Tertiary education	7	7.8	
Quranic education	49	49.9	
Consume date palm	82	91.1	
Years of consumption:			
< 5yrs	19	21.1	
10 yrs	27	30.0	
15 yrs	11	12.2	
20 yrs	6	6.7	
25 yrs	22	24.4	
above 25 yrs	5	5.6	

Source: Field survey, 2014

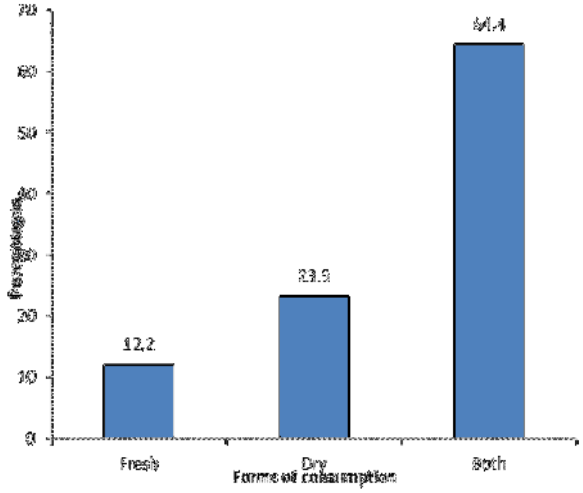

Figure 1: Form of consumption of date palm among respondents

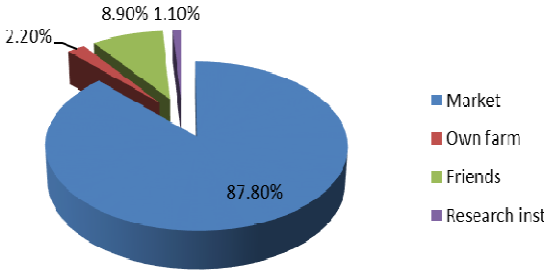

Figure 2: Main source of date palm to respondents

Sources of information on medicinal and nutritional values of date palm

Availability and accessibility of appropriate information are germane to overcoming most life challenges. Table 2 therefore shows the different sources of information utilised by respondents. The results show that majority of the respondents always source their information on the medicinal values of date palm from friends (52.2%), mosque (46.7%) and association (40.0%), while 93.3% and 46.7% never had information from church and newspapers respectively. The lack of information from church and newspapers could be an indicative of respondents' religious (Islam) affiliation and education attainment (Quaranic). Also, the respondents never made use of internet (35.6%, 33.3%) and television (41.1%, 32.2%) as sources of information on medicinal and nutritional values respectively. This may be due to poor telecommunication network, implying that the respondents made use of information sources that their low educational status could avail them with. Similarly, friends (64.4%), mosque (44.4%) and radio (37.8%) were major sources of information on its nutritional values. However, friends (mean = 2.06) was ranked 1st among sources of information to the respondents, followed by mosque (mean = 1.78) that ranks 2nd as sources of information on both medicinal and nutritional values of date palm. The results are in conformity with the findings of Meludu, Ewebiyi and Sangotegbe (2012) on street food vendors' sources of information on food safety practices.

Table 2: Distribution of respondents on their sources of information on medicinal and nutritional values of date palm

Sources	Always	Occasionally	Rarely	Never	Mean	Rank
Medicinal:						
Radio	26 (28.8)*	20(22.2)	17 (18.9)	27(30.0)	1.50	4th
Television	32 (35.6)	6 (6.7)	22 (24.4)	30 (33.3)	1.44	6th
Community health workers	18 (20.0)	10(11.1)	31(34.4)	31(34.4)	1.17	8th
Friends	47(52.2)	14(15.6)	16(17.8)	13(14.4)	2.06	1st
Health center	24(26.7)	15(16.7)	23(25.6)	28(31.1)	1.39	7th
Newspapers	18(20.0)	10(11.1)	20(22.2)	42(46.7)	1.04	9th
Churches	6(6.7)	-	-	84(93.3)	.59	10th
Mosque	42(46.7)	7(7.8)	20(22.2)	21(23.3)	1.78	2nd
Association	36(40.0)	10(11.1)	20(22.2)	24(26.7)	1.64	3rd
Internet	35(38.9)	5(5.6)	18(20.0)	32(35.6)	1.48	5th
Nutritional						
Radio	34(37.8)	21(23.3)	16(17.8	19(21.1)	1.78	3rd
Television	32(35.6)	7(7.8)	22(24.4)	29(32.2	1.47	6th
Community health workers	16(17.8)	9(10.0)	37(41.1)	28(31.1)	1.14	9th
Friends	58(64.4)	12(13.3)	12(13.3)	8(8.9)	2.33	1st
Health center	20(22.2)	13(14.4)	29(32.2)	28(31.1)	1.28	7th
Newspapers	17(18.9)	9)10.0)	25(27.8)	39(43.3)	1.04	10th
Churches	6(6.7)	-	-	84(93.3)	0.58	11th
Mosque	40(44.4)	6(6.7)	25(27.8)	19(21.1)	1.74	2nd
Association	33(36.7	17(18.9)	22(24.4)	18(20.0)	1.72	4th
Internet	31(34.4)	2(2.2)	20(22.2)	37(41.1)	1.30	7th

Source: Field survey 2014. *Figures in parentheses are in percentages

Awareness on nutritional and medicinal values of date palm

The nature of people's perception on issues is often based on their level of awareness. Table 3 presents respondents' awareness on the medicinal and nutritional values of date palm in the study area. The results show that respondents were aware that date palm has nutritional values for weight gain (77.8%), low protein (76.7%), fat content (74.4%), as well as iron and vitamins A, B, C, E (72.2%). The study further reveals that respondents were aware of the nutritional values of date palm for iron (76.7%), calcium (68.9%) and dietary fibre (61.1%). The result also reveals that higher percentages of the respondents and were aware that date palm is used for the treatment of diarrhea (75.6%), constipation and indigestion (68.9%), leprosy (66.7%), asthma (63.3%), sore eyes (62.2%) and to facilitate delivery (62.2%). Sixty three percent (63.3%) of the respondents were unaware that date palm contains antioxidants that prevents cancer and delay ageing. This implies that respondents' awareness that date palm contains cancer and ageing preventive substances is low. On the overall (Table 4), most respondents have high level of awareness on medicinal (53.3%) and nutritional (71.1%) values of date palm. This implies that the information sources of the respondents were good enough in creating high level of awareness on the nutritional and medicinal values of date palm. The result conforms to the findings of Satish (2010) and Akinbile and Aminu (2012) on *Jatropha* as a medicinal plant.

Table 3: Distribution of respondents' awareness on the nutritional and medicinal values of date palm

Awareness	Aware		Not aware	
Nutritional	**F**	**%**	**F**	**%**
Source of vitamin A,B,C and E	65	72.2	25	27.8
Source of calcium	62	68.9	28	31.1
Low protein and fat content	69	76.7	21	23.3
Good for weight gain	70	77.8	20	22.2
Source of iron	67	74.4	23	25.6
Good source of energy	69	76.7	21	23.3
Source of dietary fibre	55	61.1	35	38.9
Medicinal				
Contains antioxidants that prevents cancer and delay ageing	33	36.7	57	63.3
Date palm is a natural remedy for constipation and indigestion	62	68.9	28	31.1
Facilitates delivery in women	56	62.2	34	37.8
Good for diarrhea patients	68	75.6	22	24.4
It has anti-inflammatory supplements	46	51.1	44	48.9
Assist in remedying sexual debility	48	53.3	42	46.7
Prevents leprosy	60	66.7	30	33.3
Good asthma treatment	57	63.3	33	36.7
Prevents bronchitis	50	55.6	40	44.4
Prevents tuberculosis	53	58.9	37	41.1
Prevents fevers	53	58.9	37	41.1
Controls cough and throat disorder	53	58.9	37	41.1
Controls sore eyes	56	62.2	34	37.8

Source: Field survey 2014

Table 4: Level of awareness of respondents on the nutritional and medicinal values of date palm

Category	Scores	F	%	Mean	SD	Minimum	Maximum
Medicinal							
Low	< 7.67	42	46.7	7.67	2.86	.00	13.00
High	≤ 7.67	48	53.3				
Nutritional							
Low	< 5.08	26	28.9	5.08	1.69	0	7.00
High	≤ 5.08	64	71.1				

Source: Field survey 2014

Respondents' perception of the nutritional and medicinal values of date palm

Table 5 reveals that majority of the respondents have favourable perceptions towards most of the statements on medicinal values of date palm. These include: eating dates everyday helps in controlling leprosy, asthma, bronchitis, tuberculosis, and fevers (mean = 4.43), eating dates at bedtime and drinking a glass of warm water takes care of constipation (mean = 4.43), Eating crushed dates cures general weakness (mean = 4.42), eating dates daily assist in sexual debility

(mean = 4.39), rubbing seed of date fruit on a rough surface with water and applying the paste over the eyelids cures sore eyes (mean = 4.39) and that date is a good replacement for potassium that is often lost during diarrhoea (mean = 4.34). The result further revealed that respondents were not favourably disposed to the statement, date palm maintains healthy heart. Also, majority of the respondents favourably perceived the following statement on the nutritional values of date palm; date palm is a very good source of vitamin B-complex and C (mean = 4.78), dates are rich source of carbohydrate (mean = 4.59), dates are rich in essential minerals such as calcium, magnesium, iron, zinc, potassium, phosphorus, selenium and manganese (mean = 4.18), eating dates regularly helps to achieve healthy skin, hair and muscle tone (mean = 4.63), the seeds are used as food for horses, cattle, camels, sheep and goats and for feeding chickens (mean = 4.18) and dates are excellent dietary fibre (mean = 4.06).

The result on Table 6 shows that respondents had favourable perception towards medicinal (56.7%) and nutritional potentials (64.4%) of date palm, indicating that slightly less than half had unfavourable perception of the medicinal values. This suggests that high level of awareness of the medicinal values of date palm in the area did not translate to favourable perception of these values. On the other hand, the high level of awareness of the nutritional values did translate to favourable perception of the values. This implies also that rural dwellers did not express doubts over the efficacy of *date palm* in handling some of their nutritional needs but did raise doubts on its medicinal values.

Table 5: Distribution of respondents' perceived nutritional and medicinal values of date palm

Medicinal values	SA	A	U	D	SD	Mean	Status
Eating dates everyday helps in controlling leprosy, asthma, bronchitis, tuberculosis, and fevers	55.6	36.7	5.6	0.0	2.2	4.43	F
Eating dates at bedtime and drinking a glass of warm water takes care of constipation	54.4	38.9	3.3	2.2	1.1	4.43	F
Eating dates daily assist in sexual debility	53.3	32.2	14.4	0.0	0.0	4.39	F
Eating crushed dates cures general weakness.	54.4	34.4	10.0	1.1	0.0	4.42	F
Rubbing seed of date fruit on a rough surface with water and applying the paste over the eyelids cures sore eyes	53.3	37.8	5.6	1.1	2.2	4.39	F
Date is a good replacement for potassium that is often lost during diarrhoea	52.2	33.3	12.2	1.1	1.1	4.34	F
Dates are effective in treating gonorrhea and urinary ailments	36.7	36.7	22.2	3.3	1.1	4.04	F
Eating date fruits by pregnant women labour reduces the need for inducing women at labour	45.6	37.8	11.1	5.6	0.00	4.23	F
It reduces intoxication	63.3	17.8	13.3	1.1	4.4	4.34	F
It maintains healthy nervous system	51.1	33.3	11.1	2.2	2.2	4.29	F
It strengthens tooth	66.7	15.6	11.1	5.6	1.1	4.41	F
It strengthens tooth It is risky for diabetic patients	50.0	18.9	24.4	4.4	2.2	4.10	F
Date palm maintains healthy heart	45.6	27.8	6.7	17.8	2.2	3.97	U
Nutritional Value							
Date palm is a very good source of vit. B-complex and C	46.7	30.0	8.9	13.3	1.1	4.78	F
Dates are rich source of carbohydrate	73.3	13.3	12.2	1.1	0.0	4.59	F
Dates are rich in essential minerals such as calcium, magnesium, iron, zinc, potassium, phosphorus, selenium and manganese	47.8	31.1	14.4	4.4	2.2	4.18	F
Eating dates regularly helps to achieve healthy skin, hair and muscle tone	78.9	8.9	10.0	1.1	1.1	4.63	F
The seeds are used as food for horses, cattle, camels, sheep and goats and to feed chickens	52.2	27.8	11.1	3.3	5.6	4.18	F
It is an excellent dietary fibre	47.8	24.4	17.8	5.6	4.4	4.06	F

Source: Field survey 2014 F = favourable; U = unfavourable

Table 6: Categorization of respondents' perceived nutritional and medicinal values of date palm

Category	Scores	F	%	Mean	SD	Minimum	Maximum
Perceived values							
Medicinal							
Unfavourable	< 55.70	39	43.3	55.70	6.23	39.00	65.00
Favourable	≤ 55.70	51	56.7				
Nutritional							
Unfavourable	< 25.71	32	35.6	25,71	3.58	15.00	30.00
Favourable	≤ 25.71	64	64.4				

Source: Field survey 2014

The study reveals that level of exposure to information (r = 0.410, and 0.332) and level of awareness (r=0.504 and 0.383) (Table 7) respectively had significant relationship with respondents' perceived nutritional and medicinal values of date palm. In the same vein, levels of exposure to information (r = 0.578) and awareness (r = 0.409) significantly correlated with respondents' level of perception of the nutritional and medicinal values of date palm The results show that awareness creation using different media has been instrumental to helping the respondents understand better the nutritional and medicinal values of date palm, and this has consequently translated into their forming favourable perception of the plant' values. This corroborates the findings of Ikwuakam, Sangotegbe and Akinbile (2013) which showed that awareness had positive and significant influence on perception of *Moringa oleifera* values

Table 7: Relationship between respondents' age, household size, level of exposure to information, awareness and perceived nutritional and medicinal values of date palm

Variable	Nutritional Values			Medicinal values			
	r- value	p- value	Decision	Variable	r- value	p- value	Decision
Age	0.112	0.229	NS	Age	0.104	0.330	NS
Household size	-0.039	0.716	NS	Household size	-0.055	0.605	NS
Source of information	0.410	0.000	S	Source of information	0.578	0.000	S
Awareness	0.504	0.000	S	Awareness	0.409	0.000	S

NS = Not Significant S = Significant

CONCLUSION

The study concludes that rural households in Katsina State comprised more of young than old household heads with relatively large household size. The major source of date palm was the market and it was mainly consumed dried. The various available media used in creating awareness among rural dwellers on the nutritional and medicinal values of date palm were effective, leading to high level of awareness and favourable perception among more than half of the respondents. Rural dwellers lack awareness of few important medicinal values of the plant and Islam provided a significant platform in creating awareness as it is considered as highly valuable among adherents, thereby increasing the understanding of rural dwellers on the medicinal and nutritional values of date palm.

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RECOMMENDATIONS

Based on the findings of this, the following recommendations were made:

1. Vibrant efforts must be made by government at the state and local government levels as well as non-governmental organisations in creating awareness especially on the antioxidants content of date palm and its therapeutic potential to cancer
2. Community health workers and resident doctors in the local health centres of the study area should double their efforts in awareness creation on the values of date palm
3. The dissemination of such information should take into cognizance the specific forms of consumption for better results

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