

KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS FOOD AND DRUG EXPIRY DATE AMONG INHABITANTS OF IAD HUSSEIN AREA, AL NASER LOCALITY, KHARTOUM STATE, 2012

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Abstract

Food safety involves the safe handling of food from the time it is grown, packaged, distributed, and prepared to prevent foodborne illnesses. Foodborne illness may be caused by bacteria that grow on food or by viruses that are spread because food is not cleaned, stored, or handled properly. Expiry dates are indicative of the safety and nutritional quality of foodstuffs and nutrition. The risk of food-borne diseases increases after the expiration date, especially if the storage conditions are less than optimal. A descriptive cross-sectional study was conducted in Iad Hussein, which lies to the south of Khartoum, with the aim to evaluate the consumer KAP to food and drug expiry date. Four hundred households were selected as a sample. Interviews, questionnaires, focus group discussion and observations were used for collecting data. These data were analyzed and tested by the SPSS and significant tests. Results showed that 69% of the participants do not check the expiry date labels at all; there was a strong association between participants' income and knowledge on one hand and checking expiry date labels on the other, more than half of the participants cared about the proper storage conditions of food and drugs. On the basis of the findings a set of recommendations was formulated as; health education intervention is needed for promoting proper storage conditions of food and drugs and practices concerning checking the food or drug expiry date labels and to establish societies to deal with food and drug safety.

Keywords: Health education, food safety, food borne diseases, drugs, expiry date

Introduction

Food safety involves the safe handling of food from the time it is grown, packaged, distributed, and prepared to prevent foodborne illnesses. Food safety is the responsibility of those who handle and prepare food commercially for delivery to consumers and of consumers who prepare and eat food in their homes. Foodborne illness may be caused by bacteria that grow on food or by viruses that are spread because food is not cleaned, stored, or handled properly Acheson, et al. (1988).¹ These illnesses may cause minor symptoms or serious symptoms and even death in some people. Contaminated foods also can carry harmful parasites, toxins, chemicals, and physical contaminants. The expiration date is the date up to which the food maintains its microbiological and physical stability, and the nutrient content. This means it's important to use that food before the expiry date to get the most nutritional value from it. The expiration date for drugs and natural health products is the final day that drugs and supplement should not be used after. Expiry dates are indicative of the safety and nutritional quality of foodstuffs, nutrition. It is risky to consume unhealthy food. The risk of food-borne diseases increases after the expiration date, especially if the storage conditions are less than optimal (Christine Murebwayire, 2014)⁴. Reading food labeling information is important to assist in making informed choices of food.

Some foods with a longer shelf life and that are critical to nutrition must carry expiry dates. These foods include meal replacements, nutritional supplements, and infant formulas and formulated liquid diets, which should not be consumed after the date on the label has passed.

The drug must be safety, purity, and potency. The chemicals in drugs do break down and change over time, becoming more potent (or poisonous) or ineffective. The healthcare products such as soap and vaselines can turn out to be dangerous to someone's life if they are not critically examined. Most of the inhabitants of the Aid Hussein are used to buy and consume commodities from the street sellers and their local markets, where the commodities are brought to the area either after the expiry date or they are not meeting the national or standard health conditions. These commodities are bought at cheap prices, which attract the inhabitants to obtain it intentionally or unintentionally regardless their health hazards. The inhabitants living condition is very poor, so, there is no facilities for proper storage of food and drug. These food and drug products because of the poor storage conditions are no longer remain nutritious and safe, and that the drugs remain ineffective.

Factors that affect the expiry date of food and drug

There are some factors that affect the expiry date as temperature, humidity and direct sunlight, the condition of the storage and food safety may actually have more to do with the habits at home than with the dates on the packaging, but to have safe foods at their best, is to stick to the printed expiration dates. It is suggested that is best to keep canned and dry food at 50 to 70 degrees Fahrenheit in a dry, dark place (Peggy VanLaanen, 2014) ¹⁰. Humidity can be a factor in speeding-up deterioration. Taste, aroma, and appearance of food can change rapidly if the air conditioning fails in a home or warehouse. Obviously, cans bulging with bacteria growth should be discarded, no matter what the expiration date!

The expiration date doesn't always indicate a point at which the medication is no longer effective or has become unsafe to use. It's the true effectiveness of a drug may decrease over time, but much of the original potency still remains even a decade after the expiration date. Excluding nitroglycerin, insulin, and liquid antibiotics, most medications are as long-lasting. It is important to place a medication in a cool place, such as a refrigerator, will help a drug remain potent for many years. To assure that a drug product meets applicable standards of identity, strength, quality, and purity at the time of use, it shall bear an expiration date determined by appropriate stability testing and the expiration dates shall be related to any storage conditions stated in the labeling.

Foods should be refrigerated within two hours of purchase to be valid as refrigeration slows down but does not stop bacterial growth, so food can still go bad. Some food can be frozen, but how long it can be safely frozen depends on the type of food and its ingredients. "Some canned goods will keep for years if there haven't been wide temperature fluctuations". Higher-acid products like canned pineapple have a shorter shelf life, but are still good for a year or longer, infant formula and baby food are significant exceptions to this rule: It is best not to give your baby formula or food after the "use by" date.

Common terms of expiration date

It is very important to inform consumers about what they should know before stocking their fridges and cupboards.

- "Sell by" date is the last day the item is at its highest level of quality, the consumer should buy the product before the date expires. The concern with the quality of the item freshness, taste, and consistency rather than whether it is on the verge of spoiling, (Paul Van Landingham, 2014)⁹.
- "Best if used by (or before)" date. This refers strictly to quality, not safety. This date is recommended for best flavor or quality. Even after a

best-before or expiry date has lapsed, a food may smell or taste fine, but that can be dangerous, warns. Standards about when foods expire or are best differ in various countries according to condition of storage and climate.

- Use by" date. This is the last date recommended for the use of the product while at peak quality. The date has been determined by the manufacturer of the product. "Use by." and "Best if used by" are intended to assure consistent food quality. This type of dating provides guidance to the consumer.
- "Born on" date. This is the date of manufacture; some product can be affected by the sun. The light can reactivate microorganisms in the product. That's why the consumers have to be especially careful with product in clear bottles, as opposed to brown or green.
- "Guaranteed fresh" date. This usually refers to bakery items. They will still be edible after the date, but will not be at peak freshness.
- "Pack" date. You will find this one on canned or packaged goods, as a rule.

Foods susceptible to spoilage should not be consumed if the "best before" date is passed. Even if a food shows no signs of spoilage, it can harbour pathogenic microorganisms that can cause foodborne illness. Foods that are not susceptible to spoilage can usually be consumed past their "best before" date. These foods may have lost some of their original flavour and nutritional value. Use your senses (sight, smell) and common sense to decide if it is appropriate to eat it.

To ensure quality and safety of our food, it is important to check expiry dates on food products before consumption. In the case of some highly perishable prepackaged food (e.g. Pasteurized fresh milk, eggs, sandwiches, etc.) which are likely after a short period to constitute an immediate danger to human health, a "use by" date should be used. For other prepackaged food products, a "best before" date shall be indicated. The food may not be at its best flavour and quality beyond the date. Under the national current regulations, it is an offense to sell any food after its "use by" date. Consumers are advised to choose food before its "use by" date, and be wary of the quality of food beyond the "best before" date

The reality is that you can eat food past the food expiration date and it might still taste good. For example, milk may sour around the expiration date or a few days afterwards, depending on how cold your refrigerator is. Practicing good food safety habits at home will help food last safely up to, and beyond, the date on the label. One of the most important food safety parameters is temperature. For example, canned goods in a pantry that stays consistently cool all year round will last longer than canned goods stored in a location where temperatures fluctuate between hot and cool. Likewise,

frozen foods stored in a freezer will last longer if the freezer is not opened often, which causes temperature changes. Humidity is also a concern — keeps all storage areas dry, with low humidity.

The significance of an expiry date on food

To ensure that these foods remain nutritious and safe, and that the drugs remain effective. Read the labels. Pay particular attention to the “best before” or “expiry” dates, the indicators of shelf life can help to safeguard your health and provide some assurance that the product is nutrient and safe. Checking the expiration date on food packages to find out, food expiration dates are really guidelines to help you buy food at optimal freshness.

Stretching the Expiration Date through Proper Storage

Some food needs temperature, it is between 41 and 140 degrees Fahrenheit. Food needing refrigeration should be kept below 41 degrees Fahrenheit (Paul VanLandingham, 2014)⁹. On the loading dock, in the car, on the kitchen table, it should not be outside of that temperature for more than four hours total. You have no idea how long it may have been subjected to higher temperatures before you buy it, so you need to minimize the "standing" factor after you get it. Milk should be kept at 38 degrees, fish at 32 degrees. The drawers and shelves have different temperatures, thus the term "meat drawer."

It is better to purchase the product before the date expires, if perishable, take the food home immediately after purchase and refrigerate it promptly. Freeze it if you can't use it within times recommended on the chart. Once a perishable product is frozen, it doesn't matter if the date expires because foods kept frozen continuously are safe indefinitely. Follow handling recommendations on product, (CPCFS, 2014)¹².

Some Basic Rules

- Milk. Usually fine until a week after the "Sell By" date.
- Eggs. OK for 3-5 weeks after you bring them home (assuming you bought them before the "sell by" date).
- Poultry and seafood. Cook or freeze this within a day or two.
- Beef and pork. Cook or freeze within three to five days.
- Canned goods. Highly acidic foods like tomato sauce can keep 18 months or more.
- Low-acid foods like canned green beans are probably risk-free for up to five years. "You do not want to put the cans in a hot place like a crawl space or garage

Drug Expiration Dates

The expiration date of a drug is estimated using stability testing under good manufacturing practices. Drug products marketed have an expiration date that extends from 12 to 60 months from the time of manufacture, (Health Canada 2002)⁶. Once the container is opened, the original expiration date can no longer be relied upon. Many drug products may have extended shelf lives beyond their expiration date (Alan Goldhammer 2014)². The ability for a drug to have an extended shelf life would be dependent upon the actual drug ingredients, presence of preservatives, temperature fluctuation, light, humidity, and other storage conditions. Solid dosage forms such as tablets and capsules appear to be more stable past their expiration date. Drugs that exist in solution or as a reconstituted suspension and that require refrigeration may not have the required potential if used when outdated. Loss of potency can be the major health concern, especially when treating an infection with an antibiotic. Drugs that exist in solution form, especially injectable drug should be discharged if the product forms a precipitant or looks cloudy or discolored, Health Canada (2002)⁶. EpiPen auto injectors should not be used after the expiration date as epinephrine has been shown to lose its potency, (Alberta College, 2001)³. Expired medication that contains preservatives, such as ophthalmic drops, may be unsafe past the expiration date. Outdated preservatives may allow bacterial growth in the solution. Insulin may be susceptible to degradation after the expiration date. Vaccine, biological or blood products could also be subjected to quick degradation once the expiration date is reached. If a patient finds a medication is powdery or crumbling, has a strong smell, or has dried up, he should discharge them. Proper storage of medications may help to extend their potency. Medication remains more stable in dry, cool spaces away from light.

Rationale

Some of the Sudanese consumers are not used to check the expired date label on the products due to many socioeconomic factors. Some of the consumers purchase the expired date product intentionally or unintentionally from the street sellers as it is low in price comparing with that on other groceries or they don't care or don't use to check the expired date label. This is very risky for the consumer health.

The Data from the research can bring to the attention of policy makers on the need to have programs to improve consumer awareness towards the expiration date of food and drug products.

General Objectives

To evaluate the consumer KAP towards food and drug expiry date among inhabitants of Iad Hussein area, 2012

Specific Objectives

1. To determine how many of the inhabitants checks food and drug expiry date
2. To determine the inhabitants' knowledge concerning expired food and drugs.
3. To determine the inhabitants attitudes concerning expired food and drugs.
4. To determine the inhabitants practices concerning expired food and drugs.
5. To determine the factors that affect expired food and drug among the inhabitants

Methodology

This cross sectional descriptive study, was conducted in Iad Hussein area; Alnaser Locality; Khartoum State with the objective to evaluate the consumer behaviours towards food and drug expiry date among inhabitants, 2012

Study Area:Iad Hussein is due to south Khartoum, it is divided into five settlements squares. It is surrounded by Alazahari from the north, Naser town from the west IbadAlrahman from the south, and AlmadenaAlkhairia from the east.

Study Population: The total population of the area, according to Iad Hussein Administrative unit is about 2,500 households. The community is one of the poorest communities in the state. There are only two health centers and the environmental health condition is deteriorated. Most of the inhabitants are poor people –less educated, mostly are unskilled daily workers, soldiers, some engage in marginal activities as selling water, tobacco, cigarettes, expired commodities, second hand furniture, clothes and the rest are working in small-scale handicrafts. The inhabitants used to purchase their products from the local markets and the street sellers, where most of the commodities have expired date, and there is no or poor follow up from the health authorities.

The target group is households' members, where members between 18 and 50 years old were targeted in the study.

Sample Size Determination: A 400 households were selected from the study population by using the following sample formula; and a sample was taken proportionally from each block.

$$n = \frac{N}{1 + N \times e^2}$$

Where: n= sample size

N = total households

e = level of precision = 0.05

n = $\frac{N}{1 + N \times e^2}$ where

$N=2,500$

$e^2 = 0.05 \times 0.05=0.0025$

The sample size $=2,500/1+2,500 \times 0.0025 = 400$

A sample was taken proportionally from each block in case group as follow:

Block	Total No. of households	Total No. of Sample
Block-1	750	120 households
Block-2	500	80 households
Block-3	550	88 households
Block-4	350	56 households
Block-5	350	56 households
Total	2150	400 households

Sample Selection Technique: The cluster sampling technique was used to show the distribution of the sample in the area so the sample was selected within the block proportionally from each block by using systematic random sampling technique.

Phases of the study

Collecting data phase

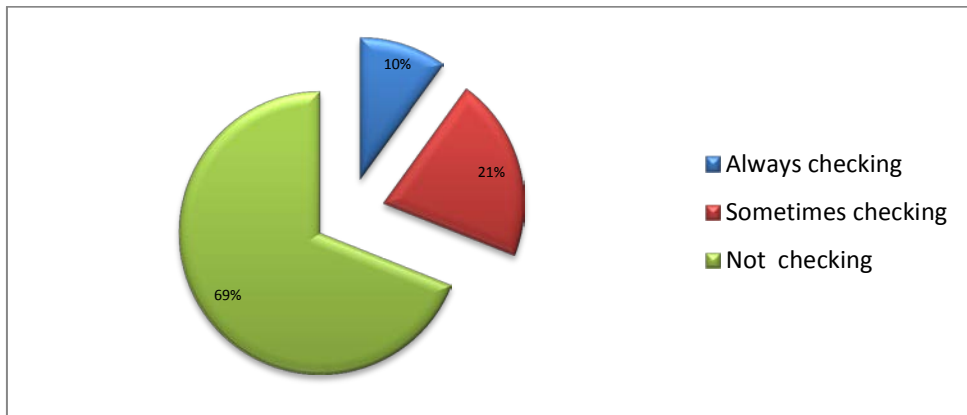
- Training sessions were carried on for one day targeting health workers and volunteers to collect data.
- A Questionnaire was distributed to obtain data concerning knowledge, attitudes and habits towards food and drug expiry date.
- Observation techniques were used to observe the habits of the inhabitants towards food and drug expiry date in groceries, markets and pharmacies in the study area.
- Focusing group discussions were held targeting consumers in the area.
- Interview the groceries, and pharmacies tailor's.

Data analysis: The data that collected was analyzed by computer using the SPSS software program.

Result: This study was conducted to evaluate the consumer's habits towards food and drug expiry date among inhabitants of Iad Hussein area, a total of 400 households were participating in the study and the results revealed the following: More than two thirds of the participants do not check the food and drug expiration date labels see figure 1. More than 67% of the participants' incomes are less than one thousand SDG per year, more than 40% of the participants are illiterate, there is a strong association between educational level and participation in health programmes, see figure3, there was a strong association between participants income and checking expiry date labels on food and drug products, see figure 4. There is also a strong association between knowledge concerning expiry date labels on food and

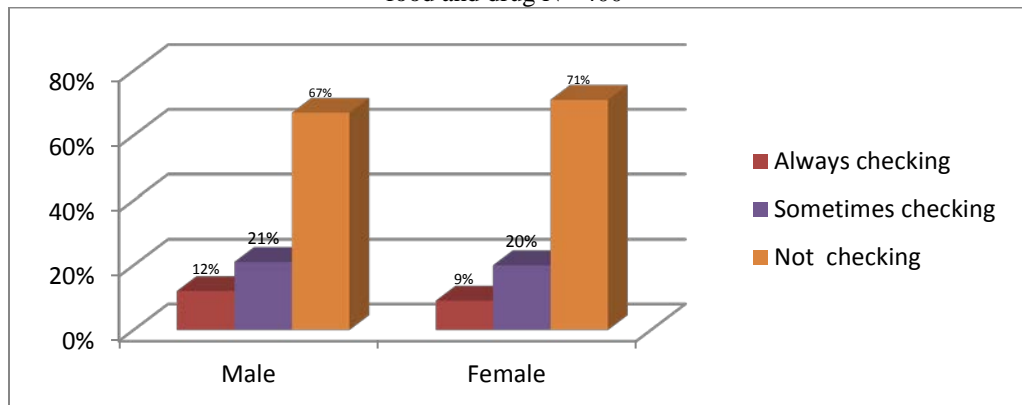
drug products and checking expiry date labels on food and drug products see Figure 5. There is no association between the attitudes of the participants concerning the hazard of consuming expired date food and drugs and the habits of checking the expiry date of these products, see figure 6. More than half of the participants care about the proper storage conditions of food and drugs see figure 7. The most sources of information concerning the issue are mass media 47% friends and neighbours 34% and work places 16% where health workers constitute only 3% see figure 8

Figure 1. The percentage of the participants checking the food and drug expiration date labels N= 400



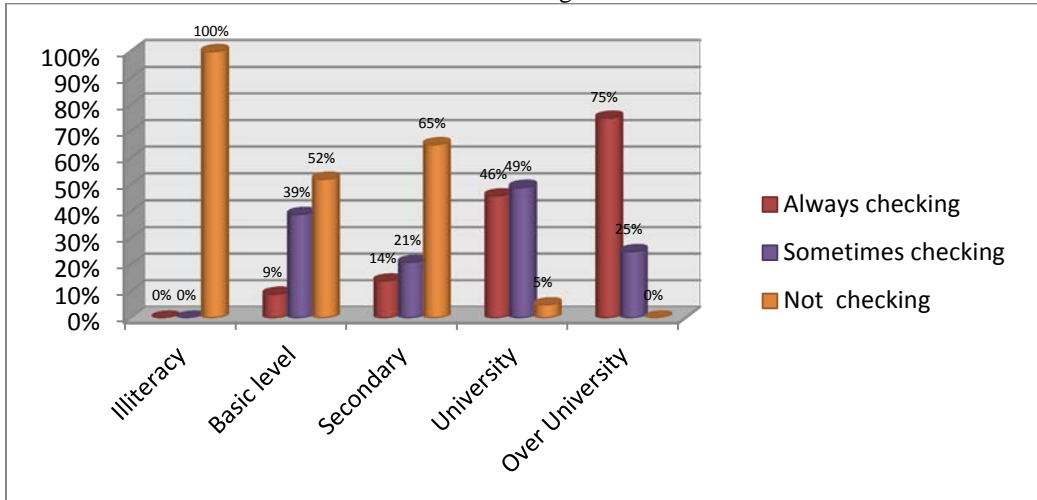
More than two thirds of the participants do not check the food and drug expiration date labels

Figure:2 The association between genders and the habits of checking the expiry date of food and drug N= 400



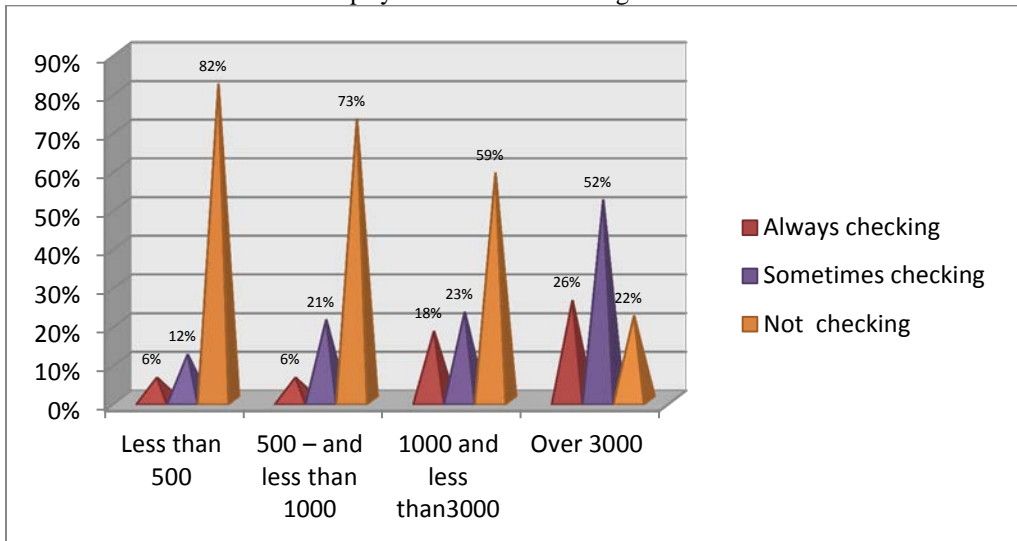
There is no association between genders and the habits of checking the expiry date of food and drug at $\chi^2 = 0.346$ df 2 p .663

Figure: 3 The association between level of education and the habits of checking the expiry date of food and drug N= 400



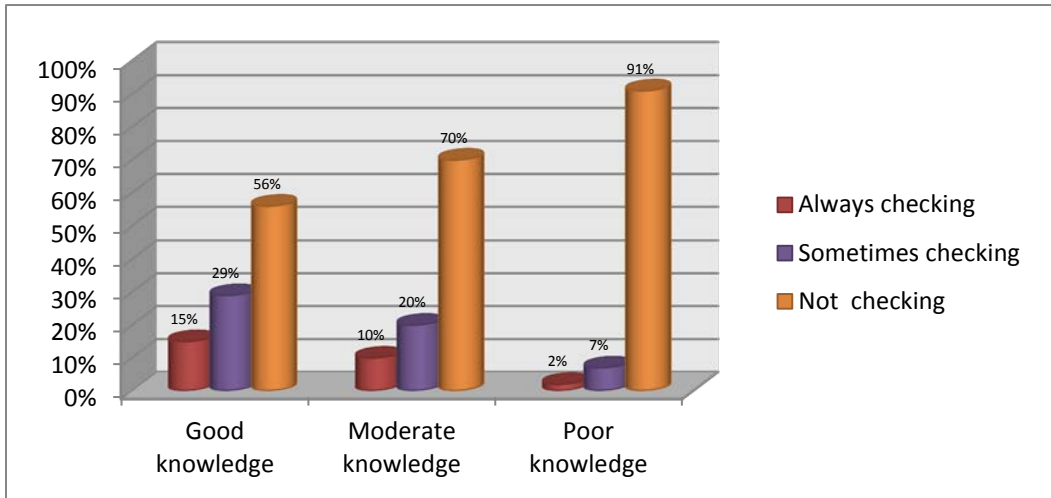
There strong association between the participant’s level of education and the habits of checking the expiry date of food and drug at $\chi^2 = 15.52$ df:8 p 0.956

Figure: 4 The association between participant’s income (SDG) and the habits of checking the expiry date of food and drug N= 400



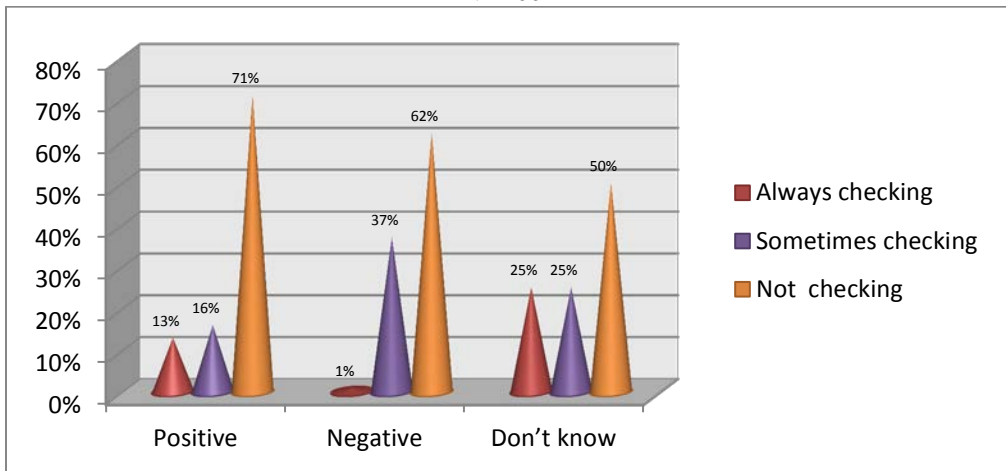
There strong association between participant’s income and the habits of checking the expiry date label at $\chi^2 = 10.46$ df:8 p .00

Figure: 5 The association between the participants’ knowledge concerning the hazard of consuming expired date food and drug and the habits of checking the expiry date label.
N= 400



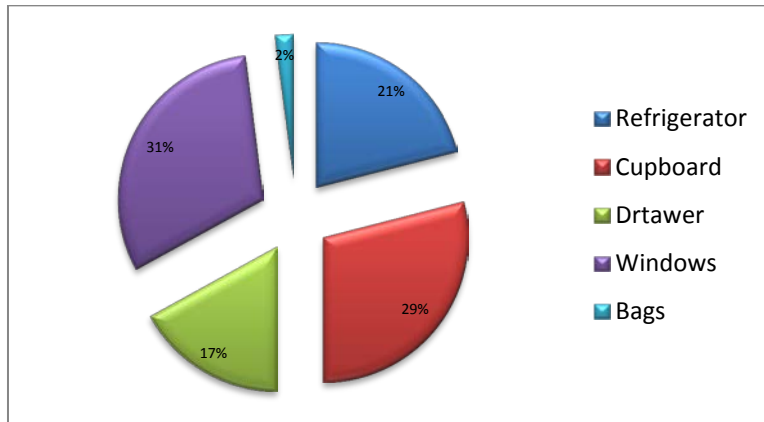
There is a strong association between the knowledge concerning consuming expired date food and drugs and the habits of checking the expiry date of food and druglabel at $\chi^2 = 2.143df:4$ p .002.

Figure: 6 The association between the attitudes of the participants concerning the hazard of consuming expired date food and drugs and the habits of checking the expiry datelabel.
N= 400

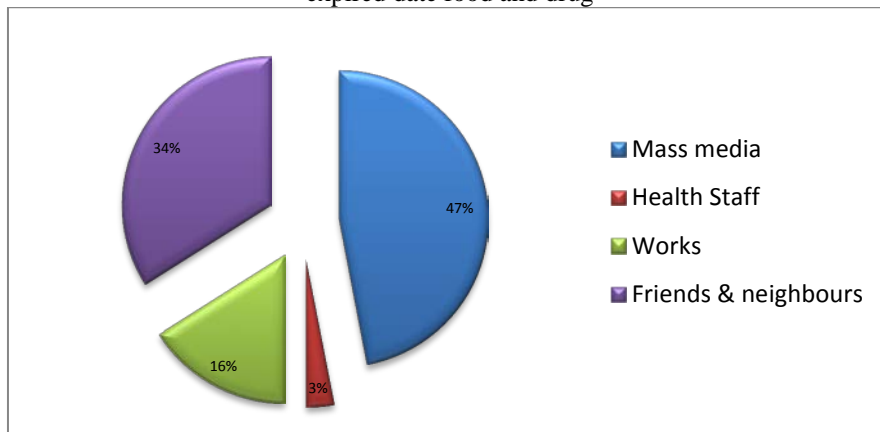


The is no association between the attitudes of the participants concerning the hazard of consuming expired date food and drugs and the habits of checking the expiry datelabel at $\chi^2 = 0.731df:4$.p. 0.956

Figure: 7 Percentage of proper storage conditions of food and drugs
N= 400



21% of the participants use refrigerators for storing food and drugs
Figure: 8 Source of the information of the participants concerning the hazard of consuming expired date food and drug



Nearly half of the participants' source of information comes from mass media

Discussions

Introduction: This descriptive cross sectional study aims at evaluating the habits of the checking the expiry date of food and drug label among the inhabitant of Id Husein Area, Alazahari Locality, Khartoum State The study revealed that more than two thirds 69% of the participants do not check the food and drug expiration date labels see figure 1; this result disagrees with the cross sectional study that conducted in the Chittoor district of Andhra Pradesh, India by Wasim Raja 2012 ¹⁴.

Socioeconomic characteristics of the participants: More than 67% of the participants' incomes are less than one thousand SDG per year, this is less than minimum wage, GNI, PPP per Capita US\$, \$1,740, (UNAIDS/WHO, 2000)¹³. The low income has a direct effect on inhabitants' felt of the primary needs regardless its expiry date. There is a strong association between the participant's income and habits of the participants concerning checking expiry date of food and drug product. The educational levels among the respondents are low, more than 40% of the participants are illiterate, this fact shows that the literacy rate among the participants is less than the national rate 70% for male and 45% for female (UNAIDS/WHO Working Group, 2000)¹³. The result showed that, there is an association between educational level and habits of the participants concerning checking expiry date of food and drug product. The low level of education affects negatively the inhabitants' checking expiry date of food and drug product. These findings agree with the study that conducted by Gwantwa Samson 2012⁷, Dar Essakaam, which concluded that consumers' checking expiry date of food and drug products is determined by different demographic characteristics such as age, sex, education level, health status and situational factors such as income, time and being in special diet can also influence a consumer use the information to make an informed food choice (Sunelle et al.,2010)¹¹.

Knowledge, attitudes and behaviors: Although there is an association between knowledge and the habits of checking the expiry date label of foods and drug, high percentage of the participants have some believes concerning the expired food as that *fire kills all germs and poisons*. Somewho have good knowledge about the risk of consuming expired date food and drug prefer to obtain the attainable low cost and cheap food, although they know its expiration date is out. This finding agrees with the study that conducted by Gwantwa Samson 2012⁷ in Ilaka, Dar Essakaam, which concluded that a large proportion of respondents with primary education 68.8% were minimally informed about food labeling. Among respondents with secondary education large proportion, 61.2% were moderately informed about food labeling. The high extent of information was observed among respondents who had college/university education whereby 38.5% of them were very much informed about food labeling. This result also agrees with the study that conducted in Lesotho by Mahgoub et al.,(2007)⁸ which observed a direct relationship between age, level of education and family income with level of knowledge and use of food labeling information in purchasing foods among consumers in Lesotho. In this study, level of knowledge and use of food labeling information increased with age, level of education and family income. Almost all the storage places 98% are improper for storing food and drug this due to their standard living

conditions as most of them haven't refrigerators see figure 7. This result agrees with the result that held in India by Wasim Raja 2012¹⁴ which concluded that about 27.27% stored medicines in cupboard and 16.67% in a drawer, 3% in cover and 1.52% stored in a refrigerator. About 6% of the stored medicines are bad condition. 1.56% of medicines at homes were already expired. Nearly half, 47% of the participants' source of information comes from mass media, 34% friends and neighbours, 16% from work places where only 3% comes from the health workers. This indicates that the health workers play a minor role and it also reflects the poor health services in the area this result agrees with the study conducted by Ebtisam and, Madiha 2013 in Benha University Hospital and Benha City Egypt⁵. The study concluded that 43% of the mothers gained their knowledge from mass media.

Conclusion

This study has revealed that socioeconomic factors, the low level of education and low level of living condition has a direct effect on the behavior of checking the expiration date of the food and drug and the storage conditions among the participants in IadHussien and according to the inhomogeneity with the other communities in the locality and the state, we cannot generalize the result to the rest population in locality. The findings also revealed that the main source of information is mass media where the role of the health workers is limited in dissemination of the information. It was also revealed that there were circumstances in which consumers did not read food labels because they purchased routine/familiar foods or the food was sold at a lower price.

Recommendations

The study recommends the following:-

- Stakeholders in nutrition in the country should work hard to help food consumers understand nutritional aspects of food and thus consider nutritional information as important information to consult before deciding to purchase or consume.
- Policy makers should encourage the health workers in the area to take their role in health education.
- Stakeholders who are concerned in one way or another with food labeling should design and implement special public education programs aiming at informing food consumers by the importance of food labeling information and how best they can use it to make informed healthy choices of food.

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