Epidemiological Study by Using a Knowledge Attitudes Practices (KAP) Model in Sanitation Survey in Gharb Area, Morocco: Descriptive Study

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ABSTRACT
The importance of sanitation survey is to facilitate improvements in the health and overall quality of life among a specific residential area or population. This investigation concerns the cities under condition monitoring in this region: Kenitra, Sidi-Kacem and Sidi-Slimane. The investigation is classified into four sections: Consumption of water, hygiene and the good practices, home and solid waste. During the period (January to December 2012), there are 1020 people polled in the Gharb area. The study found that in this area, there are 75.3% of people who drink running water. In rural areas, there are 38% who drink from “Saguia” of the village. There are 71% of people who are never aware of the risks of these diseases. The quality of the water is roily and can leave deposits to 36.3% of people questioned. Only 12.5% of people who took their bath every day and 79% of people exposed to the presence of stagnant water.

Key words: Epidemiology, waterborne diseases, hygiene practices, Gharb region, Morocco.

INTRODUCTION
It is important that the water must be in sufficient quantity and quality to satisfy the basic human needs and it is a condition for better health and sustainable development. It has been estimated, at least in Africa, that 85% of the burden of disease preventable by water supply is made by fecal-oral, mainly diarrheal diseases, largely due to the substantial child mortality which they cause (Rosen et al., 2001).

It’s difficult to classify diseases related to water. They are broadly separated into four categories: waterborne diseases, water contact diseases, water hygiene diseases and water vector habitat diseases. 1) Waterborne diseases which caused by ingestion of water contaminated by human or animal excrement, which contain pathogenic microorganisms, include cholera, typhoid, amoebic and bacillary dysentery and other diarrheal diseases. 2) Water hygiene, diseases which caused by poor personal hygiene and skin and eye contact with contaminated water. These include scabies, trachoma, typhus, and other flea, lice, and tick-borne diseases. 3) Water contact diseases which caused by parasites found in intermediate organisms living in polluted water. These include Schistosomiasis and Dracunculiasis. 4) Water vector habitat diseases which caused by insect vectors, particularly mosquitoes, which breed or feed near contaminated water. They are not typically associated with lack of access to clean drinking water or sanitation services. These include dengue, filariasis, malaria,
onchocerciasis, trypanosomiasis and yellow fever (Stanwelle-Smith, 2001).

The aim of the study is to explore the causes of waterborne diseases and safe practices in the Gharb area by a KAP study, which enlighten us on how individuals or groups feel about specific things, what they know, and how they act (Eckman et al., 2008).

MATERIALS AND METHODS

Study area

The perimeter of Gharb is located in the northwest of Morocco and covers an area of 8805 km² (Kenitra: 4745 km² and Sidi-Kacem 4060 km²) or 1.2 % of the national area. It consists of a coastal zone (dune, flooded depressions) of continental margins and the central alluvial of Sebou which is the main Oued (ORMVAG, 2013).

Methodology

According to the Moroccan Minister of Health, three cities in the region are in the monitoring system: Kenitra, Sidi-Slimane and Sidi-Kacem. In our survey, the study is conducted in these cities and their neighborhoods in the region. The sampling method was applied to several randomly with the multistage. The questionnaire was administered in two models: one in French and the other in French translated into Arabic for the people who do not speak the French especially in the rural areas.

The samples are divided between the university Ibn Tofil, cafe, neighborhoods and streets. The university students of Ibn Tofil belonging to rural areas are educated on the questionnaire and they carry the model translated into Arabic to their villages and conducted the survey for their families and neighbors. The questionnaire is to assess knowledge, attitudes and practice (KAP) of the general population in the Gharb Area (Hauser, 1991) in water related diseases, hygiene and good practices (Alwashali et al., 2014).

RESULTS AND DISCUSSION

Sample Design for Survey

In this study, there are 57 % of people from Kenitra, 16% of people from Sidi-Slimane and 11 % of people from Sidi-Kacem. The participants from other cities in the region are 16% of the sample. The investigation had applied to the subjects between 15-60 years in the region of Gharb –Morocco. The criteria for inclusion are tough:

1. Living in the areas either in rural or urban province;
2. Accept freely to participate in the survey;
3. With 44.8 % of people surveyed have an age between 20 and 22 years old, 20% of people have an age between 22 and 24 years. There are 83% of people respondents have a lower or equal age 24 years old. The dominance of this category is 'explained by the large participation of university students and families who belongs to the region of Gharb.

The total sample is 1020 people, which 44.3% of people are male and 55.7% of people are female. The minimum of age is 12 years old, the maximum is 59 and the standard deviation is 6.13. In the province, there are 76.8% of people from urban regions and 23.2% of people from rural regions.

Water Consumption

Water is the primary topic of the investigation knowing that most of water-related diseases can be caused by other causes such as food. This questionnaire is based on the life cycles of the diseases
Concerned. Running water is considered the primary source of drinking water in the region. The quality of running water is different from one city to another because of the difference his source and the level of sanitary control of the water.

It may come from groundwater, river and can be another source who submitted several treatments. In this region, there are 75.3% of people are drinking the running water and 2.4% of people never drink running water in comparison with mineral water, 5.7% of people who always drink bottled water, and 54% of people rarely drink. This decrease may be in poverty and the awareness of waterborne diseases.

The taste of water is an indicator that determines the quality of water. It's acceptable to 37.4% of people and it is in the four ranking in the question and unacceptable to 4.7%. The change in taste of the water because of the content of trace elements and mineral salts. It can be varied depending on the season. The level of supervision and treatment of the water is important, especially the amount of chlorine that is added and not be felt. In this study, there are 63.3% of people who see clear water and 36.3% of people who find water can leave deposits. Among the simple methods of water treatment at home is the boiling. This is an efficient method to kill microorganisms. There are only 6.8% of people who do this treatment at home.

In rural areas, there are 38% of people who drink from “Saguia” of village and 54% of people who rarely drink. This explains the dominance of disease frequency in rural areas. The pools are characterized by the presence of diseases caused by the diarrhea, which the Cryptosporidium is a resistant germ for the coloring. The pollution is caused by swimmers urinate in swimming pools. The Legionella may be present in the pool whose water temperature is high and the change of the pool water is not regular. There are 3.7% of people bathe in the pool always and 24.5% of people often bathe in the pool. In Morocco, there isn’t a standard for the pools and water hospitals too.

There is 13% of people who swim in lakes with 13.3 of them rarely bathe. There are 73% of people who never bathe in a lake.

There are 71% of people who are never aware of the dangers of these diseases. Eating fruits and vegetables without washing is harmful to health because of the pesticides that may be cast on the skin. The fresh water washing is important. In this study, there are 29.1% of people who eat fruits and vegetables without washing and 70.9% who answer with no.

The hot water will kill some microorganisms. In this field, there are only 7.3% of people who wash fruits and vegetables with hot water and 92.7% who answer with no. This distribution can be excused by the lack of training as there is a large percentage that holds hot water in their homes.

The lack of a common source is the main reason for storing water at home. Whatever the method of storage, it is essential to use clear containers with covers to prevent water pollution. In this study, there are 31.9% of people store water at home with 28.3% of people let this storage open. A clear correlation between modes of water storage and reproduction of disease vectors such as malaria and dengue (OMS, 2011).
<table>
<thead>
<tr>
<th>Parameter with valid total frequency</th>
<th>Taste of water N=1011</th>
<th>Drinking running water N=1008</th>
<th>Drinking mineral water N=993</th>
<th>Drinking from “Saguia” in village N=987</th>
<th>Swimming pool N=981</th>
<th>Bathing lake N=990</th>
<th>Visual quality of water N=1008</th>
<th>Awareness to diseases N=987</th>
<th>Boiling the water before drinking N=1008</th>
<th>Eating fruits and vegetable without washing N=999</th>
<th>Washing fruits and vegetable with hot water N=993</th>
<th>Water storage in home N=996</th>
<th>Water storage closed N=381</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unacceptable</td>
<td>4,7</td>
<td>76,20</td>
<td>5,7</td>
<td>3,6</td>
<td>3,7</td>
<td>3</td>
<td>63,7</td>
<td>28,6</td>
<td>91,4</td>
<td>29,1</td>
<td>7,3</td>
<td>31,9</td>
<td>71,7</td>
</tr>
<tr>
<td>Acceptable</td>
<td>37,4</td>
<td>11,90</td>
<td>23,3</td>
<td>8,2</td>
<td>24,5</td>
<td>10,6</td>
<td>29,8</td>
<td>71,4</td>
<td>8,6</td>
<td>70,9</td>
<td>92,7</td>
<td>68,1</td>
<td>23,3</td>
</tr>
<tr>
<td>Good</td>
<td>28,2</td>
<td>9,50</td>
<td>54,7</td>
<td>17,6</td>
<td>30,6</td>
<td>13,3</td>
<td>6,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>13,6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Table 1: Number (%) respondents on the water consumption
**Hygiene and Good Practice**

In this argument, several questions raised regarding hand washing and using the bathroom, which is the source of infection for various diseases. The hand is the first vectors of transmission of infections due to put them everywhere in our body especially in the mouth. Adding that the hands are also in touch with the people we as usual greeting. In this study, there are 93.5% people who wash her hands always after out of the bathroom. The washing efficiency is dependent on with which the wash. There are 53, 3% of people who wash with water and disinfectant often, 33, 2% of people with water and disinfectant rarely and 13, 5% of people with water only.

Many people have the habit of using a public toilet frequently. This frequent use may be causing significant infections due to practices that transmit diseases such as towels of toilet that everyone uses and other materials toilet as the sink faucet. The risk of urinary tract infections in women is possible in the communal toilets because of the time which they spend in toilets and equipment which they use more than the human race. There are 54.1% of people who utilize the public toilets and often and always between 10% of people never use. Among the people who use the communal toilets, there a 31%, 2 people who use towels collective toilets between always and often and 45.4% who never practiced.

The Hand washing and the toilet are in associations with kitchen are always related to infection. Even if they wash their hands after using the toilet, but it is not effective to kill all pathogens in their hands and other pathogens can be cast in and dressed in women's jewelry. There are 64% of people who wash their hands before cooking often and 8.3% of people who do not wash before cooking. Among them, there are 8.9% who going to the toilet always during cooking and 21.5% who go to the toilet often during cooking.

Our body secretes sweat in different quantities of a man to another. Usually take a bath every day, especially in the summer is better. Only 12.5% of people who take a bath every day. There are 55.8% of people who take it at least once a week. After the bath, the towel should be used by one person to protect from infection. There are 64.9% of people who do not share the shower towel and the rest divided between the families, friends and everyone. The risk of underwear comes from his contact with the genitals. Change underwear every day or more than once a day is essential especially for women. There are only 41.3% of people who changing underwear every day and 11.5% of people who change it weekly.

Under the long fingernails, germs accumulate a reason that the hands are in contact with it. The frequency of cutting the nails is different from one person to another. This frequency depends on the nail growth. In this question the frequency is approximate. There are 47% of people who cut nails in more than a week and 9% of people who cut it in less than three days.

The hygiene of the child should be among the priorities of health in the family because it can carry several diseases such as trachoma. Trachoma spreads easily from one person to another and it is frequently passed from child to child and from child to her mother in the family (OMS, 2013). At the outset, it is best to place the feces in the potty and explain to children that the lot includes the stool. Here is where the child can use the bathroom. There are 42% of people who file them in the trash, 38,
3% of children use the toilet and 8.4% of the people who throw the stool in the toilet.

**Home**

Prevent from disease is to have a clean house with the running water and breast. Several questions were asked about the water situation in place and cleaned.

By weighting urban and rural rates, access to safe drinking water rates and a form of improved sanitation in Morocco would average 81% and 73%. In Tunisia the rates reach 93% and 85%, respectively (RSPNA, 2008). In this study, the running water source is municipal water treated with 83.3% and the rest is from private wells and other sources.

A home exposed to stagnant water and wastewater is a health risk for people. The air pollution causes respiratory diseases. By adding that malaria is caused by infected sewage and mosquito. The “Oued Sebou” is the main Oued in the area and mentioned early in the study environment with these tributaries. In this study, there are 58.3% of people, which their homes is exposed to stagnant and 21.7% of them are exposed to wastewater.

In this study there are 38.5% of people have at least one type of pets mentioned in the responses to this question are: Cats, dogs, birds, chicken, cow, donkey, sheep and goats.

The fecal matter allows transmissions of several diseases and that is why the type of toilet is important. There are two types of toilet in the region traditional and modern. There are 55.6% of people, which their homes contain traditional toilets. Traditional toilet is in two types: An outhouse or toilet Berbers whose fecal matter are separated from the urine and turns and used as fertilizer for the plant in agriculture and the other with the material fecal and urine has the same output channel which is called the traditional toilet japonica. The modern toilets are flush with the seat.

In this study, there are 5.9% of people which have wastewater networks of their home is the septic tank. Have an independent site toilets to wash the hands in the home is in a role to avoid cross contamination. There are 86.6% of people who have a place to wash hands in their homes. The distribution of the types of toilets is explained by the lack of the wastewater network especially in rural areas. There are 39% of people which have a home is not connected to the waste water system. In Morocco, official statistics show that 58% of urban centers suffer floods which 45% are due to inadequacies of conventional sewerage (Toumi, 1997).

**Solid Waste**

The presence of solid waste either near of home or thrown into water can be an infection and environmental contamination. Questions are asked about the papers of toilet and home situation towards the solid waste. The papers can be non-degradable or may need time to put down. In the purification plants, small waste cardboard and paper escape and often come in rivers and beaches which can be a pollution sources for health and the environment.

In the region, there are 56.6% of people who throw papers in waste waters and 37.3% of those throw them in the trash. In some neighborhoods, the solid wastes have accumulated a delay collection, or people throw the rubbish in the streets concerned especially to rural areas. In this study there are 37.5% of people with their families are exposed to solid waste. The accumulation of this waste is often once a week or more for
81.7% and 7.9% of people who collect waste by themselves.

<table>
<thead>
<tr>
<th>Parameter with valid total frequency</th>
<th>Valid percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The child uses the toilet</td>
</tr>
<tr>
<td>Feces of children N=924</td>
<td>38,3</td>
</tr>
<tr>
<td></td>
<td>Water+disinfectant often</td>
</tr>
<tr>
<td>Washing hands with N=1002</td>
<td>53,3</td>
</tr>
<tr>
<td></td>
<td>Every day</td>
</tr>
<tr>
<td>Take a shower N=1005</td>
<td>12,5</td>
</tr>
<tr>
<td></td>
<td>You only</td>
</tr>
<tr>
<td>Using a shower towel with N=1011</td>
<td>64,9</td>
</tr>
<tr>
<td></td>
<td>Every day</td>
</tr>
<tr>
<td>Changing underwear N=987</td>
<td>41,3</td>
</tr>
<tr>
<td></td>
<td>Always</td>
</tr>
<tr>
<td>Washing hands after using the toilet N=1011</td>
<td>93,5</td>
</tr>
<tr>
<td>Using a public toilet N=960</td>
<td>25</td>
</tr>
<tr>
<td>Using a bath towel of public toilet N=945</td>
<td>15,9</td>
</tr>
<tr>
<td>Washing hands before preparing food N=975</td>
<td>64,6</td>
</tr>
<tr>
<td>Going to the toilet during preparing food N=948</td>
<td>8,9</td>
</tr>
<tr>
<td></td>
<td>Less than three days</td>
</tr>
<tr>
<td>Cut nails in N=996</td>
<td>9</td>
</tr>
</tbody>
</table>
CONCLUSION

The resurgence of waterborne diseases in the region of Gharb is the cause of water is due to that people drink running water without filtering as they find that the quality is roily and can leave deposits. In rural areas, the” Saguia” of the village is a source of drinking water and people swim in the lakes. There is a severe lack of awareness in waterborne diseases and seafood. For best practices and hygiene, people eat fruits and vegetables without washing, leaving the storage of water open, washing his hands with water only after using the toilet and before preparing food, using towels collective toilet, going to the bathroom during the preparation of meals, not having the habit of carrying a bath and changing underwear frequently and leaving the kids to use the bathroom alone without training or sensitization.

People live exposed to sewage, stagnant water, solid waste, still stung by a mosquito, using traditional toilets and home are not connected to the sewage system.

REFERENCES


