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Study of Food Poisoning among Students of the City of Mohammedia, Morocco

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ABSTRACT

Food poisoning among children represents a major public health problem. Our contribution is based essentially to study the prevalence of food poisoning among students of the city of Mohammedia in Morocco. The study was conducted from the results of an epidemiological survey prospective assessment on a sample of 625 students chosen at random in six institutions of urban origin with 321 of female students 51.4% and 304 male students 48.6%. The prevalence of intoxication is 65.3%, the sex ratio is balanced (Female/Male) 1.10 ($p<0.35$). On 408 students suffered an intoxication 194 (47, 55%) are male and 214 (52, 45%) are female. According to the seasons 51% have been observed in the summer period, 20% during the fall and 15% during the spring of same for the winter. The distribution of poisoned by function of sex and the establishment has not demonstrated a significant difference (Khi-2 =0.97; $p<0.22$; 5df). The distribution of respondents according to the category of age shows an association very highly significant between the two variable (Khi-2=313.09; $p<0.000$ to 5 df). The age category of the most affected is that of the students whose age more than 12 years. The prevalence of food poisoning is considerable; this can be linked to health education, information, communication in the area of food hygiene and the awareness of students and of the social and economic impact.

Keywords: Food poisoning; Prospective; Prevalence; Educated population

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INTRODUCTION

The foods generally come from the immediate environment, yet they can be contaminated during their production, processing, transport, storage or handling. Either accidental or volunteers, these contaminations can be of chemical origin, physical and or biological. They can put at evil our health [1].

Food poisoning is a major public health problem in the world [2].In the United States, for 76 million of food poisoning (26,000 to 100,000 inhabitants) whose 325.000 people have been hospitalized (111 for 100,000 inhabitants) and 5,000 people died (1.7 for 100,000 inhabitants) [3].

In France, the number of deaths due to these infections of food origin is approximately 10%, and 6% of subjects were hospitalized because they have shown signs of severe intoxication [4].

Another study has shown that the number of these diseases was approximately 2 365 909 cases in 1995 in England and Wales [5].

In Morocco, a gradual increase over the past ten years has been found. In fact the number of cases and episodes of food-borne disease collectively (FBDC) from 1996 to 2001 has doubled. The FBDC represent, in Morocco, 11% of the poisonings. More than 90% of the FBDC are of bacterial origin confirmed or probable. Approximately 7% of cases are of chemical origin: Contamination of Food by pesticides, especially. Meadows of 1% of the cases: ACIT of plant origin (Addad). The remainder of indeterminate origin (1.5%) [6].

In 1959, the drama of the falsified oil has been at the origin of the hundreds of dead and disabled engines in thousands of people. Later, the events of the poisoning to mussels (1994), to the mortadella (1999), snails (1997), and the melon (1997), to the vodka (1997), to alcohol to Burn (2009) have been highly publicized [7].

MATERIALS AND METHODS

The study is carried out during the period of December 2014 to November 2015, the sample for the survey consists of 625 students; 304 boys (48.6%); and 321 girls (51. 4%) in six institutions of urban origin in the city of Mohammedia: two primary schools (Ghazali and wallada); two Middle schools (Mohammedia and Allal Ibn Abed Allah) and two secondary schools (Eljoulane and Jaber Ibn Hayan).

The collection of data has been made through a questionnaire prepared within the Laboratory of Genetics and Biometry and validated by experts in the field and thus confirmed by the validation test (index of crombach= 0.82).

The operation statistics of the data has been made by software designed for this kind of investigation. The results are expressed either in the form of average more at least the gap type or form of frequencies absolute or relative.

RESULTS AND DISCUSSION

Prevalence of the Intoxication

The calculation of the prevalence of food poisoning, any product confused, has allowed declaring a finding quite high among these students surveyed. In addition, on 625 cases, 60% responded that they had suffered a intoxication, which corresponds to a prevalence of 65.3% (n=408 students) against 34.6% (n=216) having declared were never felt a poisoning. The distribution of respondents on the basis of sex shows no significant association between the two variables (Khi-2=0.64; p<0.42 to 1 df), with a gender balanced ratio (F/M) of 1.10 (p<0.35). Indeed, on 408 students suffered an intoxication 194 (47,55%) are male and 214 (52,45%) are female. The positive predictive value among male is 63,81% against 66.87% among the female sex.

The Attributable Risk (RA) or (excess): it's the difference between the rate of intoxication among male "exposed" and female "not exposed " is 3.06%. The Odds ratio (OR) is 0.87 (CI: 0.63 - 1.21).

Temporal Study of Poisoning

The results of the distribution of cases poisoned by a function of the seasons are represented by the (Figure 1) the results are expressed in relative frequency in percentage. It is apparent from this graph that 51% of food poisoning has been observed in summer period, 20% during the fall and 15% during the spring, same frequency in the winter. This large difference could be explained by the direct or indirect involvement of certain factors biological (bacteria, virus….), physical (temperature, pH…) and/or chemical that help to the rapid proliferation of germs in the food, especially during the warm period. As well, the prevalence is accentuated by bad habits related to the increased consumption of fruit and vegetables during the summer period.

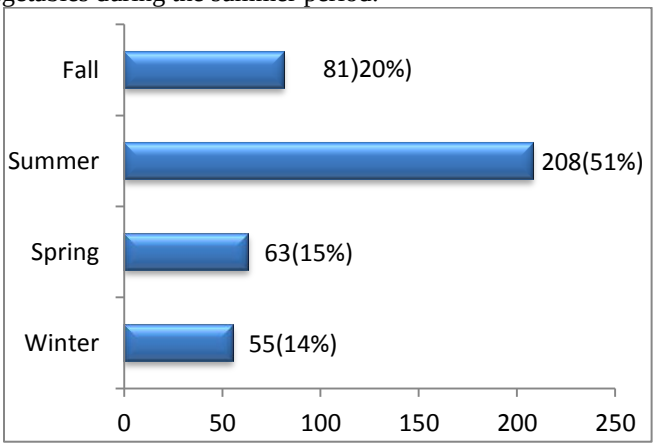

Figure 1: Seasonal distribution of cases of poisoning.

Space Study of the Poisonings

The Table 1 summarizes the results of the health indicators among students poisoned by of food by institutions. The frequencies of the poisonings fluctuate between a minimum PVP of 49,64% registered in the secondary school Jaber Ibn Hayan and PVP a maximum of 87,10% displayed at the College Mohammedia The khi-2 test of independence shows a strong association between these two factors in the establishments primary school Ghazali (Khi-2=20.83),

Middle school Mohammedia (Khi-2=14.34) and secondary school Jaber Ibn Hayan(Khi-2=19,59). Indeed, a strong association between the occurrences of the intoxication in the school Ghazali, with an intensity of Yule of 0.51.The Attributable Risk (AR) is 15.28% between students poisoned the school Ghazali and poisoned in the other institutions. The odds ratio (OR) is 3.1 (CI: 1.87 - 5.13) in favor of the students of this institution. Similarly, at the level of the secondary school Jaber Ibn Hayan, the intensity of connection is also important

Q =0.4, with an RA of 20.26%. OR is 0.42 (CI: 0.29- 0.62). On the other hand, the middle school Mohammedia, AR is 24.11%. OR is 0.6 (CI: 1.85- 8.51). However, and despite the fact that the Khi-2 test has not confirmed the link between intoxication and school of Wallada, Allal Ibn Abdelleh and Eljoulane, the representation of the cases intoxicated (VPP) is shown as important, it's respectively 59,69%; 64.6% and 56.90%. This can be explained by the geographical situation of the institutions in the face of the peddlers. These small shops of fortune are multiplied, they exercise without prior authorization and escape any sanitary control and endanger the life and health of the students.

Table 1: Prevalence in the establishments.

	intoxication		*Total*	*PVP %*	*Khi-2*	*Yule Q*	*Odds Ratio*	*AR %*	*CI*
	Yes	*No*							
Primary School Ghazali	102	21	123	82,93	20,83	0,51	3,1	**28, 15**	1,87-5,13
Primary School Wallada	77	52	129	59,69	2.33	0.15	0.73	-7.18	0.49-1.09
Middle school Mohammedia	54	8	62	87,10	14.34	0.6	3.97	24.11	1.85-8.51
Middle school	73	40	113	64,60	0.04	0.02	0.96	-0.96	0.63-1.47
Allal ben Abed allah									
High school Jaber Ibn Hayan	69	70	139	49,64	19.59	0.4	0.42	-20.26	0.29-0.62
High school Eljoulane	33	25	58	56,90	2.04	0.2	0.67	-9.35	0.39-1.16
Total	408	216	624	65,38					

PVP %: Predictive Value of a Positive Test; AR %: Attributable Risk; OR: Odds Ratio; Q: Coefficient of Yule; CI: Confidence Interval

Prevalence of Poisoning in Function of the Sex

The distribution of poisoned by function of sex and the establishment has not demonstrated a significant difference (Khi-2 =0.97; p<0.22; 5df). However, the sex ratio (F/M) is shown balanced in all institutions, with a slight dominance of the female sex except the establishment wallada (male 45: 32 women) where the report of the F/M is reversed (Figure 2).These results are similar to those published by Belomaria and al5, on the region of the Gharb Chrada Bni Hssen in Morocco during the period 2001 and 2006, 55% of addicts are female and 45% are male [8].

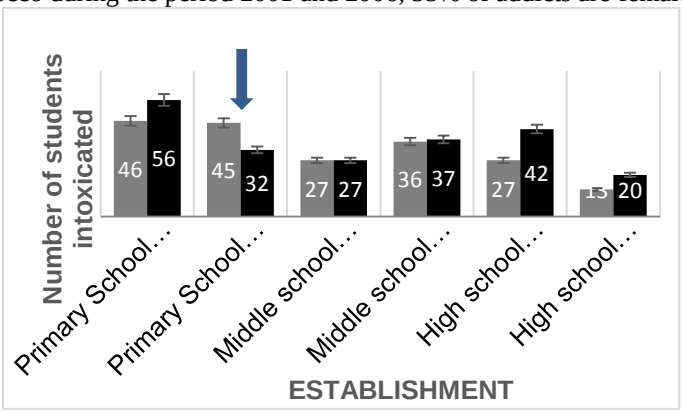

Figure 2: Prevalence by sex in the establishments

Prevalence According to the Age of the Investigated Children

The distribution of respondents according to the category of age shows an association very highly significant between the two variable (Khi-2=313.09; p<0.000 to 5 df).The age category of the most affected is that of students

whose age is over 12 years of age [224 (54,90%) students either (male 102: 122 female)] vs. [184 (45,10%) students either (male 92: 92 women)] whose age less than 12 years (Table 2).

Table 2: Prevalence by sex in the establishments

Establishment		Under 12 years old	Over 12 years old	*khi-2*
Primary School Ghazali	**M**	43	3	**151.26**
	F	56	0	
Primary School Wallada	**M**	41	4	**91.83**
	F	28	4	
Middle school Mohammedia	**M**	4	23	**15.37**
	F	7	20	
Middle school Allal ben Abed allah	**M**	4	32	**52.53**
	F	1	36	
High school Jaber Ibn Hayan	**M**	0	27	**68.21**
	F	0	42	
High school Eljoulane	**M**	0	13	**29.49**
	F	0	20	
total		**184**	**224**	

M: Male; F: Female

This is due to the fact that the adolescent has no long-term vision of his health and the power supply, beyond the physiological needs, must bring pleasure, usability, and independence. And also can be explained by the disorders of the food behavior, period associated with the pubertal transformations of the body, but also an important step in the process of identity construction, such as anorexia mental which constitutes one of the major problems of public health, by its prognosis and its serious psychological consequence somatic and [9].

CONCLUSION

The absence of hygiene and the unsanitary conditions of foodstuffs exposed before the doors of the school establishments represent a major public health problem and particularly to the children in school. Therefore, the manipulators of the Foodstuffs (MDA) can be carriers of a wide range of germs that can cause many of the infections to consumers. Of this fact, activities conducted in the street food sector aimed at the implementation of strategies aimed at controlling the perverse effects of the sale of foods in the street [10]. According to a survey conducted by Diarra [11] .In Mali, the perception of the directors of the institutions, teachers and of the vendors of food show that the places of sale are unhealthy [12]. According to its article released on 27 April 2017, the World Health to clarify that more than 300 children aged 3 to 12 years taken from vomiting or nausea in some 50 schools in Rouen (France), they had eaten of the food from the same central canteen located in Bois Guillaume, in the north of Rouen [13].

The prevalence of food poisoning Accidental among children of school age to the city of Mohammedia is considerable. The results of this study show that the problem of food borne illness among student respondents achieves half of the overall sample. According to the sex, we found no significant difference between boys and girls. The age category of the most affected is that of the students whose age more than 12 years. This can be linked to health education, information, communication in the area of food hygiene and the awareness of students and of the social and economic impact.

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CONFLICT OF INTEREST

All of the authors have contributed to the conduct of this work. All the authors also claim to have read and approved the final version of the manuscript.

REFERENCES

[1] JCE Panisset, H Dewaillyand, L Doucet. 'Food contamination', Environment and public healthFund and practice, Edisem / Tec & Doc, Action Vale. Paris, **2003,** 369-395.
[2] R Hamza, I Sghair, A Mechri, R Béjaoui, A Falfoul, A Slama, M Rafrafi, S Mchirgui, S Belhadj, M Boubakri. *Rev Tun Infectiol*. **2007,** 1(3), 12-21.
[3] World Health Organization. Food safety and foodborne diseases. Memory Aid No. 237, **2000.**
[4] MW Borgdorff, Y Motarjemi. Food Safety Unit - World Health Organisation. **1997,** 50(1-2), 12-23.
[5] M Belomaria, AOT Ahami, Y Aboussaleh, B Elbouhali, Y Cherrah, A Soulaymani. *Antropo*. **2007,** 14, 83-88.
[6] K Benkaddour. Epidemiological situation of collective foodborne diseases in Morocco, 1992-2001. National seminar on the application of the HACCP system in the field of food hygiene. Ministry of Health, Rabat, **2002.**
[7] LS Aoued, L Benlarabi, Ouammi, R Soulaymani-Bencheikh. 'Diseases of food origin', Data from the Poison Control Center of Morocco (1989-2008). Toxicology Morocco, N ° 6 3rd quarter. **2010.**
[8] GK Adak, SM Long, SJ O'Brien. Trends in indigenous foodborne disease and deths. England and Wales. **2002,** 51, 832-841.
[9] B Francois et Florence Maillochon, JB Richard. "Disturbed food pipeline of young people. Between social factors and psychological distress ", Agora debates / youths / 1 (N ° 63), **2013,** 128-139.
[10] Organization of the United Nations for the Food and Agriculture (FAO), Documents and reports of projects on the informal sector of the power supply (Côte d'Ivoire, Ghana, Morocco, Niger, Nigeria, Uganda, Zaire), 1984-1996. FAO, Rome (limited distribution). Many texts not published: Working documents of the meetings in reference 5 and 6, **1996.**
[11] DC Diarra. Strategies to improve the food supply in twenty schools of Sabalibougou in commune V of the District of Bamako-MALI. **2012.**
[12] World Health, 2017 "More than 300 child victims of a food poisoning in Rouen".
[13] M Peden, K Oyegbite, J Ozanne-Smith, A Hyder, C Branche, AKM F Rahman. World Health Organization, United Nations Children's Fund Child Injury Prevention Report. WHO edition, **2008,** 123-44.