

## **Knowledge about Mumps Infection among Medical Students in Diyala City, Iraq**

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### **Abstract**

**Background:** Mumps is a childhood disease characterized by swelling of the parotid glands, salivary glands and other epithelial tissues, causing high morbidity and in some cases more serious complications such as deafness.

**Objectives:** To assess the knowledge of medical students regarding mumps virus infection and its transmission and prevention among Diyala Medical Students in Baqubah City, Iraq.

**Patients and methods:** A cross-sectional study was conducted on 250 medical students in Baqubah City, Iraq, during the period from October 2017 till January 2018. A self-administered questionnaire was used for data collection. In addition to basic demographic characteristics, the questionnaire included 14 questions about routes of transmission, effect and prevention of mumps.

**Result:** Diyala medical students had good levels of awareness about viral transmission, and vaccination program while in some aspects such as knowledge about mumps effect, location of the vaccine in the human body and diagnosis showed intermediate awareness according to modified Bloom's cut off point. Additionally, student in clinical years had significantly higher level of awareness than student in preclinical years ( $P < 0.05$ ).

**Conclusion:** General positive attitudes of Diyala Medical students toward mumps infection. However, some knowledge gaps were identified A critical level of public awareness and vaccination coverage, particularly among young students are essential to increase the knowledge among this group. Further research will needs to explore the reasons behind some intermediate and poor knowledge in a more in-depth manner to decrease the burden of the disease during another outbreak in Diyala in the future.

**Key words:** Diyala medical student, mumps infection, vaccination, viral transmission. 1,2,3 College of Medicine-University of Diyala- Diyala-Iraq

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### **I. Introduction**

Mumps a member of the family *Paramyxoviridae*, is an enveloped particle containing a non-segmented negative strand RNA molecule of 15,384 nucleotides [1]. Humans are the only natural hosts for mumps virus, which is usually passed from one person to another through saliva, nasal secretions, and close personal contact. The incubation period of mumps averages 16-18 days, with a range of about 2-4 weeks [2].

The disease is characterized by painful swelling of the parotid glands, but can involve numerous other tissues and organs, resulting in a wide array of inflammatory reactions, including encephalitis, meningitis, orchitis, myocarditis, pancreatitis and nephritis [3].

Before routine mumps vaccination programmers were introduced, 95% of adults had serological markers of exposure, with the peak acquisition during childhood [4]. Following the use of mumps vaccine in the USA in the late 1960s, disease incidence declined dramatically, and by the 1980s very few cases were reported. By 2001 the disease was on Centers for Disease Control and Prevention [5].

The current immunization schedule represents a consensus of The Advisory Committee on Immunization Practices, the American Academy of Pediatrics, and the American Academy of Family Physicians. These groups currently recommend administration of the first dose of MMR at 12-15 months of age and administration of the second dose at 4-6 years of age [6].

Several studies done about knowledge of different viral infection in Iraq such as hepatitis B virus among medical student in Erbil city [7]. Another study done in a Karbala city about seasonal influenza vaccine knowledge in medical staff [8]. A recent study done among health care workers in Baqubah Teaching Hospital toward HIV/AIDS infection [9]. But there is no study about mumps virus infection, also due to health care worker, especially physicians and medical students are always in direct contact with the patient and are

vulnerable to the questions of these infectious diseases, and they are responsible for severe complications such as infertility and deafness. So this study design to assess this point.

## II. Patients and methods

Cross sectional study was conducted among undergraduate medical students at the College of Medicine - University of Diyala is located in Diyala governorate from October 2017 till January 2018. A total of 250 randomly selected students, from both preclinical (first, second and third year) and clinical (fourth, fifth and sixth year) study years, were invited to participate in the study.

A specially designed questionnaire was used for data collection. In addition to basic demographic characteristics. The students were asked to answer each question with 'yes' or 'no'. All results interpret according to modified Bloom's cut off point as following, good knowledge (80-100%), moderate knowledge (60-79%) and poor knowledge < 60% [10].

### Statistical analysis

The statistical analysis was conducted using a descriptive approach and a multivariate approach. The statistical package for social sciences (SPSS) version 18 was used for data entry and analysis. The statistical significance was set at  $p < 0.05$ .

## III. Results

A high proportion of the study participants were females 182 (72.80%) than males 68 (27.20%), also most study group was in the age group above 20 years 172(68.20%) and equal numbers were collected from each preclinical and clinical students as shown in Table (1). And statistical analysis shows highly significant differences regarding gender and age.

**Table (1):** Demographic characteristics of study sample.

Characteristic	No (%)
<b>Gender</b>	
Male	68 (27.20%)
Female	182 (72.80%)
Total	250 (100%)
<b>Age</b>	
≤20	78(31.20%)
>20	172(68.20%)
Total	250(100%)
<b>Study year</b>	
Preclinical	125(50%)
Clinical	125(50%)
Total	250(100%)

The p-value is < 0.00001. The result is significant at  $p < .05$  with age and gender

The sample was comprised of 250 responders, of whom 230 (92.00%) had good knowledge about the rate of transmission of respiratory secretion. Just over half of respondents 199 (79.60%) have moderate knowledge about mumps infection is curable disease cannot be continued for life, also most of respondents 188(75.20%) knew that mumps infection is the effect on infertility, while poor knowledge was recorded between study groups in effect, of mumps infection in children and adult as shown in Table (2).

**Table (2):** Distribution of study population, according to general knowledge about mumps infection.

Questions	Yes Number (%)	No Number (%)	P - value
<b>Knowledge about rout of transmission</b>			
-Blood transfusion	80 (32%)	170(68.00%)	0.000 Sig
-Sexual contact	35(14%)	215(86%)	
-Feco-oral rote	103(41.20%)	147(58.80%)	
-Respiratory secretion	230(92.00%)	20(8.00%)	
<b>Knowledge about effect</b>			
-People with mumps can be infected for life	51(20.40%)	199(79.60%)	0.000 Sig
-Do you think mumps can cause infertility	188(75.20%)	62(24.80%)	
-Do you think mumps is more dangerous in adult than children	134(53.60%)	116(46.40%)	
<b>Knowledge about prevention</b>			
-Mumps disease can be cured	204(81.60%)	46(18.40%)	0.000 Sig
-Mumps disease can cause death	86(34.40%)	164(65.60%)	
-Received MMR vaccine	223(89.20%)	27(10.80%)	
-This vaccine is a shot given subcutaneously	153(61.20%)	97(38.80%)	

Regarding knowledge about diagnosing of mumps infection, high percentage 174(69.60%) of participants chose a combination of symptoms, physical signs and laboratory confirmation of the virus; followed by 60 (24.00%) symptoms and physical signs while low frequency 16 (6.40%) associated with laboratory confirmation of the virus, statistical analysis showed highly significant differences as shown in Figure (1).

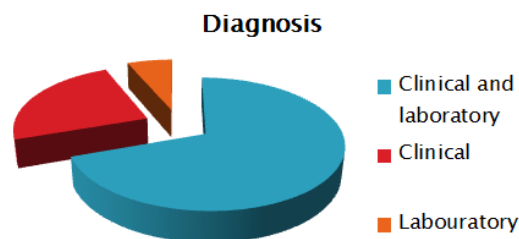


Figure (1): Diagnosis method of mumps infection.

According to knowledge scores, most of the responders were in clinical students than preclinical student, and statistical analysis showed highly significant differences between two groups as shown in Table (3).

Table (3): Distribution of knowledge about mumps infection among preclinical and clinical student.

Questions	Preclinical		Clinical	
	Yes No.(%)	No No.(%)	Yes No.(%)	No No.(%)
<b>Knowledge about rout of transmission</b>				
-Blood transfusion	52(41.60%)	73(58.40%)	28(22.40%)	97(77.60%)
-Sexual contact	27(21.60%)	98(78.40%)	8(6.40%)	117(93.60%)
-Feco-oral rote	69(55.20%)	56(44.80%)	34(27.20%)	91(72.80%)
-Respiratory secretion	107(85.60%)	18(14.40%)	123(98.40%)	2(1.60%)
<b>Knowledge about effect</b>				
-People with mumps can be infected for life	37(29.60%)	88(70.40%)	14(11.20%)	111(88.80%)
-Do you think mumps can cause infertility	85(68%)	40(32%)	103(82.40%)	22(17.60%)
-Do you think mumps is more dangerous in adult than children	60(48%)	65(52%)	74(59.20%)	51(40.80%)
	74(59.20%)	51(40.80%)	97(77.60%)	28(22.40%)
<b>Knowledge about prevention</b>				
-Mumps disease can be cured	99(79.20%)	26(20.80%)	105(84%)	20(16%)
-Mumps disease can cause death	50(40%)	75(60%)	36(28.80%)	89(71.20%)
-Received MMR vaccine	99(79.20%)	26(20.80%)	124(99.20%)	1(0.80%)
-This vaccine is a shot given subcutaneously	88(70.40%)	37(29.60%)	65(52%)	60(48%)

#### IV. Discussion

The present study design to assesses the mumps infection awareness and attitude among Diyala medical student. So MMR vaccine was introduced in Iraq for the first time 1996, but several outbreaks occurred especially in 2016 [11]. Also outside Iraq such as in Korea [12], United States [13], Italy [14], and the Netherlands [15]. This could be related to immunity of individual, used certain type of drugs (immune suppressed) or could be related to vaccine such as immunogenicity, efficacy and safety.

Regarding demographic characteristics among study sample, high percentage of participants were recorded among females than males, this result disagreement with several studies done in different area in Iraq [7][8]. This may be related to culture of certain area in Iraq so most girls married at an earlier age or could be related to people in Diyala governorate living under extreme condition and many boys were killed in different years.

According to the knowledge about the rout of transmission, the result of current study revealed that high proportion of study participant (92%) had good knowledge about mumps transmission by respiratory secretions this could be related to knowledge was highest for students reflect good curriculum of collage of medicine. While low percentage associated with other routes (14% for sexual route, 32% for blood transfusion and 41% for feco-oral route), those related to half of participants were preclinical students, so did not visit the hospital regularly and contact with medical cases also did not study the subject. Also, this result disagreement with result of recent Italian study done by Albano *et al.* who demonstrated that healthcare workers are not fully aware of the influenza mode of transmission; HCWs with good knowledge of this issue were those who mostly read pertinent scientific literature [16].

Moderately knowledge about effect also studied, the majority of medical students in this study identified effect of mumps on infertility 1(75.20%) also people with mumps infection is curable disease cannot be continued for life 199 (79.60%). While poor knowledge were noticed regarding on knowledge about mumps is more dangerous in more adult than children and statistically non- significant; this associated with students believe clinical features are similar in children and adult. This result compares with result of study done in Qatar and found that knowledge, attitude, and awareness of infection prevention and control (IPC) measures among Weill Cornell Medical Students in Qatar were found to be inadequate. Multifaceted training programs may have to target newly graduated medical practitioners or the training has to be included in the graduate medical curriculum to enable them to adopt and adhere to IPC guidelines [17].

Mumps disease can be cured gotten high percentage 81.60% among medical student while 18.40% of medical student miss belief that mumps vaccine is ineffective. Also in this study, student knowledge about mumps vaccine was satisfactory, in which 89.20% of students had good knowledge about vaccination programs this possible explanation of national data awareness about mumps were common. But poor knowledge about the type of vaccine given by subcutaneous (61.20%). Little attention is given by health care workers (HCWs) to vaccination against measles, mumps and rubella, as well as against varicella, while these are fundamental for susceptible HCW since in recent years the epidemiology of these diseases has changed, involving more and more adults and older people instead of children [18-22].

Type of mumps diagnosis showed significant association with knowledge of medical student so high percentage 174(69.60%) of participants chose a combination of symptoms, physical signs and laboratory confirmation of the virus; followed by 60 (24.00%) symptoms and physical signs.

The result of current study showed that clinical students had significantly higher mean knowledge scores than did preclinical students regarding mumps infection, this result is in agreement with a couple of previous study [7].

In conclusion, general positive attitudes of Diyala Medical students toward mumps. However, some knowledge gaps were identified. A critical level of public awareness and vaccination coverage, particularly among young students are essential to increase the knowledge among this group. Further research will needs to explore the reasons behind some intermediate and poor knowledge in a more in-depth manner to decrease the burden of the disease during another outbreak in Diyala in the future.

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