

## Effect of educational guideline on children`s knowledge, attitude and practice regarding rabid animals and rabies.

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### Abstract

**Background:** Rabies is an acute highly fatal infectious disease affecting all warm blooded animals and man.

**Aim:** To evaluate effect of educational guidelines program on children`s knowledge, practice regarding rabid animals and rabies.

**Subjects and Methods:** A quasi-experimental design was utilized. The study was conducted at Al-Shrouk and Al-Awall School preparatory and secondary in Beni Suef city. A purposive sample of 400 children from the previously mentioned setting. The following study tools were used (pre/posttests):

1) A Self-administered questionnaire to assess their knowledge as regards rabid animals and rabies.

2) An observational checklist to evaluate studied children`s practices.

3) Children`s attitude (Likert scale): to evaluate studied children`s attitude.

**Results:** There was a highly statistically significant difference ( $P < 0.0001$ ), regarding their knowledge, attitudes and practices before, immediately after, and at follow up guideline implementation toward rabid animals and rabies.

**Conclusion:** The present study concluded that, the educational guideline had a positive effect on children`s knowledge, attitudes and practice regarding rabid animals and rabies. **Recommendations:** the continuous educational training and early intervention should be conducted to avoid further complication and handicaps. Further studies should be carried out on a large number of such groups of studies for evidence of the results and generalization.

**Keywords:** Rabid animals, Rabies, Children`s knowledge, Attitudes, Practice.

Accepted on 24th December, 2021

### Introduction

Rabies is deliberated as one of the firstborn communicable illness that distresses all animals [1]. This illness is initiated by a rhabdovirus and is frequently conveyed to individuals done the bite from a diseased animal [2]. The in height load of rabies linked deaths in greatest developing countries, expect the actuality of unproductive human and animal rabies control and prevention courses WHO [3]. Rabies origins viral encephalitis that kills over 50,000 individuals each year. The main stream of fatalities are in developing countries of Africa and Asia and about 6000 deaths yearly subsequent in massive financial sufferers. Worldwide, rabies prerogatives 55,000 deaths annually are production it the 11th greatest fatal communicable illness globally [4]. Rabies is extensively feast in Morocco, with an average of 391 animal and 22 human cases each year [5]. The incidence concentration of human deaths related to rabies typically ranges from 20 to 30 cases per million people annually in India, 7.0 to 9.8 cases per million people yearly in Pakistan and 14 cases per million individuals yearly in Bangladesh [6,7]. The huge public consequence from a bite from a rabid dog, children are at extra hazard of suffering dog bites than adults and as a outcome approximately 40% of all

human rabies losses occur in children aged below 15 years old [8,3].

The virus is spread by infected saliva in bites, scratches of skin, intact skin licking, food, coitus, inhalation of aerosolized saliva and *via* licks from infected animals in mucosal membranes and exposed wounds [3,9]. Then the virus is spread from the bite of wound location *via* the peripheral nervous system and it produces experimental symptoms in stage with obliteration of the nervous tissue. Certain other tissues similarly become infected with virus, such as muscles and the salivary glands which is why saliva develops infectious to other persons that originate in interaction with it [10].

Rabid animals such as, cats, dogs, sheep, cows, pigs, goats, rabbits and jackals can communicate virus initial in the contagion for of the transmission of virus to the salivary glands and the saliva a rise at the same time as the virus is transmitted in the central nervous system. This origins nervous signs, such as, eating abnormal items, aggressiveness profuse salivation, difficulty in swallowing, change in sound, dropping of the jaw roaming over long distances and an increased risk of biting people or other animals, and the danger of spread of virus to occur instantaneously in an infected animal. Dog bites are a significant way of spread for rabies disease in humans [11].

Complimentary attacks, restlessness, aggressiveness and excessive salivation are certain of the signs of rabies in dogs. Hydrophobia, headache and behavioral changes and a wound that itches or is painful are certain samples of signs of rabies in humans [3]. Humans, as well as animals, typically die in a week after the first nervous signs are seen.

The role of pediatric nurse in instructive standard for children concerning rabid animals and rabies is actual significant and dangerous character to increase their information, practices and attitude concerning of controlling, preventing and improving rate of recovery the rabies in the orientation program and the in-service reminder exercise. Also, it confirms that, the children, who are involved in guideline program application, are qualified and capable to accomplish the technique with competent technique that leads to appropriate care of rabies and improving recovery rate and thus preventing the incidence of rabies and its difficulties. Information, and practice, attitudes surveys are commonly used about the world for public health related studies based on the principle that information will enhance health seeking behavior and practices against disease. As a consequence of moving practices, attitudes and disease problem can be diminished as seen in circumstance of diverse illness circumstances [12].

Educational programs have been recommended to avoid dog bites by supporting the information of dog conduct by growing children's information around rabid animals, definition of rabies, causal agent of rabies, rabies spread, clinical manifestation, causes in animals and humans, analytic examinations and children's attitude related to rabid animals to avoid rabies by hand washing before and after dealing with animals, immunization program for his animal and should be prevented children to conduct with animals or should be avoided get feed dog from children's nutrition. Then, all lacerations or injuries are achieved with washing location of rabid animals with water and soap, follow up with specialist, immunization yourself against rabies and care of wound with beta dine [13].

### ***Significance of the study***

Rabies has the core case death proportion of any communicable illness and postures a significant danger to public health and veterinary, although actuality avoidable. Currently, this ignored virus-related to zoonosis is present day in at least 150 countries and on each area except for Antarctica. Rabies virus is the greatest vital participant of the Lyssa-virus genus. However, this acute progressive viral encephalitis still sources havoc in the common of Africa, Asia, and the Middle East, where unvaccinated cats and dogs common [13,14]. Rabies is one of the 17 main ignored global tropical illnesses and is prevalent in most nations. At current, the world can be allocated into three main areas regarding to rabies: areas with enzootic canine rabies; areas that have complications with nature rabies but canine rabies is under controller or has been eradicated; and so-called "rabies-free" nations [15].

Enzootic canine rabies is still at great in most countries of Asia, Africa, and the Middle East. There is absence of studies concentrating on the vector transmission, risk factors, epidemiological studies and economic assessments of the illness. Monitoring and surveillance data revealed that individuals in Egypt experience a big number of animal bites annually with more than 200 000 animals' bites noted every year commonly from dogs. On average 60 people die yearly from rabies in Egypt [15]. The Middle East includes of nations that are governmentally, socially, and economically varied and are frequently topic to conflict and discontent. Importantly, an absence of suitable data is widespread about transmissible illnesses in the part [11].

As result of the close connection between the canine population and human is a main danger issue for illness manifestation. There is a large dog people (about 2,798,126) and low immunization percentage in developing countries of Africa and Asia; coupled with unhindered drive and imitation, these issues may complicate rabies regulator labors [12]. Furthermore, discovering children's knowledge, attitude and recognizing their implements concerning rabies in order to regulate the gaps, faults and effort essential to overwhelmed the faults by building and smearing a well-designed instructional program constructed on the recognized requirements and explanations to supplement children's knowledge, attitude and progress their performs concerning rabies. Therefore, the current study aimed to evaluate effect of educational guidelines program on children's knowledge, practice regarding rabid animals and rabies.

### ***Aim of the study***

To evaluate effect of educational guidelines program on children's knowledge, practice regarding rabid animals and rabies. This aim was achieved through the following

- To assess children's knowledge about rabid animals and rabies.
- To assess children's practices for rabid animals and rabies.
- To assess children's attitude for rabid animals and rabies.
- To develop and implement the educational guideline based on children's rabid animals and rabies and evaluate its effect on their knowledge, attitude and practices.

### ***Research hypothesis***

- The children's knowledge will be significantly improved after implementing the rabid animals and rabies educational guidelines children, compared to their pre-knowledge level.
- The children's practice will be significantly enhanced after implementing the rabid animals and rabies educational guidelines in children, compared to their pre-practice level.
- The children's attitude will be significantly positive after implementing the rabid animals and rabies educational guidelines in children, compared to their pre-practice level.

## **Subjects and Methods**

### **Research design**

A quasi-experimental design was used in order to accomplish the aim of the study. This design used to compare studied groups and measure the degree of change occurring as a result of treatments or interventions.

### **Setting**

The present study was conducted at Al-Shrouk and Al-Awall School preparatory and secondary in Beni Suef.

### **Subjects**

All available children with rabies or dealing with rabid animals (causative agent of rabies) attended at previous setting, (400) children are willing to participate in the study and didn't attend any program about rabid animals and rabies in children.

### **Study tools**

#### **Two tools were used in this study for data collection:**

First tool: A Self-administered questionnaire: Developed by the researchers after reviewing of related literature [13,14]. It was used to assess the following parts:

Part (1): Socio demographic characteristics of children, such as; age, sex, education level, parents' education, socio-economic status, residence and animal ownership.

Part (2): Assessment sheet regarding children's knowledge about rabid animals and rabies in children pre, post, and follow up guideline implementation. It assesses main concepts in animal bits and rabies, which included 15 open-ended questions regarding definition of rabid animals (1 question), definition of rabies (1 question), causative agent of rabies (1 question), rabies transmission (1 question), causes (1 question), clinical manifestation (1 question), diagnostic tests (1 question), children's attitude towards rabid animals, rabies prevention (4 questions), medical treatment (2 questions), complications (1 question), and nursing care (1 question). This questionnaire distributed in the same form three times (pre, post-program implementation, and at one month's follow up) for the same group of children. The questionnaire alpha Cronbach reliability test equal 0.84.

Scoring system: Knowledge content was divided into 15 questions and each question was assigned to three score levels: Complete and/or correct answer was scored 3, while incomplete correct answer was scored 2, and don't know or wrong answer was scored 1. The total score was categorized into either satisfactory level (from 70% and more) or unsatisfactory level (<70%) from total score 45.

II-An observational checklist (pre/post and follow up tests). Adopted from [15,16]. It was filled in by helping the researchers to evaluate children's practices in relation to rabid animals and rabies as hand washing before and after dealing with rabid animals, washing site of rabid animals with water

and soup, follow up with doctor, vaccination program for his animal, vaccination yourself against rabies and wound care with beta dine.

Scoring system: Each step was assigned to two score levels, which are: done was scored 2 and not done scored 1. The total score was categorized into either competent (from 85% and more) or incompetent (less than 85%) from total score as the following: Hand washing before and after dealing with animals(10 steps) and total score=20, washing site of rabid animals with water and soup (6 steps) and total score=12, follow up with doctor (5 steps) and total score=10, vaccination program for his animal (6 steps) and total score=12, vaccination yourself against rabies (7 steps) and total score=14 and wound care with beta dine (6 steps) and total score=12. The checklist's Alpha Cronbach reliability test equal 0.86. The practice total score equal 80.

III-Children's attitude (Likert scale): (pre/post and follow up tests) it is adapted from Tenzin et al. [17]. It was used to assess children's attitudes regarding rabid animals and rabies as "You do not allow stray dogs to roam freely into my compound, a dog that bites someone should be caught and killed, it is not good to nurse an unknown sick dog, if you am bitten by a dog, you will go to the hospital, it is good to let dogs roam to get food because it makes them grow stronger, it is inhumane/bad to confine your dog, it is good not play with unknown dogs, keeping dogs that are not vaccinated against rabies is dangerous and should be avoided and children should be allowed to play with dogs". Testing reliability of the scale items using alpha Cronbach test=0.83.

Scoring system: Attitude (Likert scale): Likert scale consists of 10 statements and scores as follows: 3 score for agree, 2 score for disagree and 1 score for don't know. The total score level of attitude was classified into: Positive attitude: From 80% and more, while indifferent attitude: <80%-60%, and negative attitude: <60%.

### **Validity and reliability of study tools**

Content validity was established by a group of experts 5 including: 3 pediatric nursing, 2 professors of epidemiology and public health. Their opinions were enthused regarding to the tools format layout, consistency, scoring system. The tools content was verified regarding to the knowledge accuracy, relevance and competence. Reliability of all items of the tools was done. The reliability test of was established by using the Cronbach alpha to assess internal consistency construct validity. Cronbach alpha r=0.86 and 0.84.

### **Administrative design**

An official approval was obtained from the administrators of the study settings to carry out the study. A clear explanation was given about the aim, nature, importance and expected consequences of the study.

### ***Pilot study***

A pilot study was conducted on 10% of the total study subjects (40 children) to test the clarity and practicability of the tools, and suitability of the setting. The pilot study sample is then excluded from the main study sample as there were no modifications on the tools.

### ***Ethical considerations***

Approval to conduct the study was obtained from the director of the previous selected setting. All children who agreed to participate and meet the inclusion criteria were knowledgeable about the study aim and their rights according to research ethics to participate or not in the study. Then, they gave their consent to participate in the study.

### ***Field work***

Afterward official permissions to carry out the study, were gained the aim of the study was explained to the subjects in each study setting. The study was carried out over a period of 12 months from beginning of February 2019 to end of January 2020. The average time spent to fill in the tools was 30 minutes for the self-administered questionnaire and 5 minutes for (Likert) scale of children's attitude. The previously stated settings were visited by the researchers 2 days/week (Mondays and Tuesdays) from 9.00 am to 2.00 pm.

### ***Educational guideline phases***

This program was conducted on five consecutive phases, assessing, developing, implementing, evaluating, and follow-up.

#### ***Assessment phase***

A pre-educational guideline assessment was achieved using the self-administered questionnaire for data gathering from the previously stated settings. This phase aimed at assessing children's knowledge, attitude and practice regarding rabid animals and rabies.

#### ***Preparations program***

- An educational guideline was developed based on actual children's need assessment about rabid animals and rabies.
- Content of the guidelines was written in simple Arabic language by the researchers, consistent with the related literatures and children's level of understanding.
- The guidelines were presented in theoretical and practical sessions. Subjects were divided into small groups (9-10) children and repeated sessions included all children. Each group attended 4 sessions (2 theories and 2 practices). Moreover, each child was guided by simple instructions and then orientation about the aim, contents and expected outcomes was done.

**Firstly:** The theoretical sessions were taken in 2 sessions (each session for 30 minutes) and cover the following items: definition of rabid animals, definition of rabies, causative agent

of rabies, rabies transmission, causes, clinical manifestation, diagnostic tests, children's attitude towards animals, rabies prevention, medical treatment, complications, and nursing care regarding rabid animals and rabies.

**Secondly:** Sessions were conducted in the method of lectures/discussions, followed by the practical part which consisted of two sessions (each session for 30 minutes) and covers the following items hand washing before and after dealing with animals, washing site of rabid animals with water and soap, follow up with doctor, vaccination program for his animal, vaccination yourself against rabies and wound care with beta dine in the form of demonstration and re-demonstration using role play, simulator, real objects, discussions and brainstorming. The researchers used effective media of assigning information as, power point presentations and posters. A guideline handout was developed and offered for children as a reference to be used after guideline implementation.

#### ***Program construction***

- Content of the guidelines was prepared in simple Arabic language by the researchers, steady with the related literatures and children's level of understanding.
- The guidelines were presented in theoretical and practical sessions. Subjects were divided into small groups.
- (9-10) mothers and repeated sessions included all children. Each group attended four sessions (2 theories and 2 practices). Moreover, each child was directed by simple instructions and then orientation about the aim, contents and expected outcomes was done.
- Children were informed to be in contact with the researchers by telephone for any guidance.
- Evaluation for the effect of guidelines on the studied children using the pre-constructed tools as follows:
- Posttest was done after application of the guidelines.
- Follow up test after one month later by using the same tools

#### ***Implementation of the program***

The educational guideline implementation was conducted at the previously stated settings. At the beginning of the first session, an orientation of the educational guideline and its aim was presented. Children were divided into groups, and each group involved of 9-10 children approximately. Each session started with a summary about what had been given through the previous sessions and the objectives of the new topic, taking into consideration the use of simple language to suit the level of children's educations. As well, the session ended by a summary of its content outline and a feedback gained from others.

The educational guideline was carried out through 4 sessions, the time of each session ranged between 30-45 minutes according to the children's needs and condition of the group. The theoretical part of the strategic guideline was presented in two sessions in the form of lectures/discussions, followed by the practical part which consisted of two sessions in the form

of demonstration and re-demonstration using role play, simulator, real objects, discussions and brainstorming. The researchers used effective media of conveying information as, power point presentations and posters. A guideline handout was developed and offered for children as a reference to be used after guideline implementation.

**Evaluation phase**

The evaluation phase was done immediately post implementation of the educational guideline and at follow up one month later by comparing changes in children`s knowledge, attitude and practices regarding educational guideline for rabid animals and rabies.

**Statistical design**

The data collected were organized, sorted, tabulated and analyzed using the Statistical Package for Social Sciences

(SPSS). They were presented in tables and charts using numbers, percentages, means, standard deviations, t-test and Chi-square (X<sup>2</sup>) test. Level of significance was considered p<0.0001.

**Results**

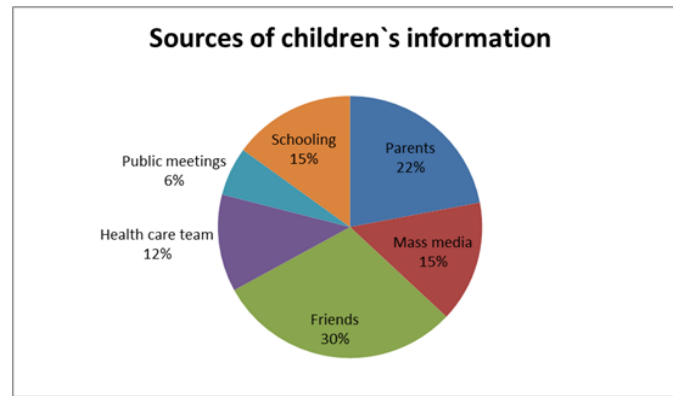
Table 1 show that 47.5% of the studied children their age ranged between 6-18 years with a mean age of 12.9 ± 2.1 years. Concerning their sex, 55% of them were females. As regards level of education, 50% of them were primary education. In relation to parents` education 42.5% were primary and secondary educational level, and 45% have middle level of socio-economic status. As regards residence, 55.0% of them reside rural areas and 100% of them contact with animals.

	Socio-demographic characteristics	No	%
Age/years	6-<10	120	30
	10-<14	190	47.5
	14-<18	90	22.5
	Mean ± SD	12.9 ± 2.1	
Sex	Male	180	45
	Female	220	55
Education level	Primary	200	50
	Preparatory school	100	25
	Secondary	100	25
Parents' education	Illiterate	130	32.5
	Primary and secondary	170	42.5
	High	100	25
Socio-economic status	High	80	20
	Middle	180	45
	Low	140	35
Residence	Urban	180	45
	Rural	220	55
Animal ownership	Contact	400	100
	None	0	0

**Table 1.** Characteristics of the Children about Rabid Animals and Rabies (n=400).

Figure 1 illustrates that the sources of information for children were friends 30%, followed by parents 22%, then school and mass media 15%, and the least public meetings 6%.

Table 2 points out that there are highly statistically significance improvements with in children`s knowledge post-immediately and at follow up guidelines implementation as regards all knowledge items about animal bits and rabies.



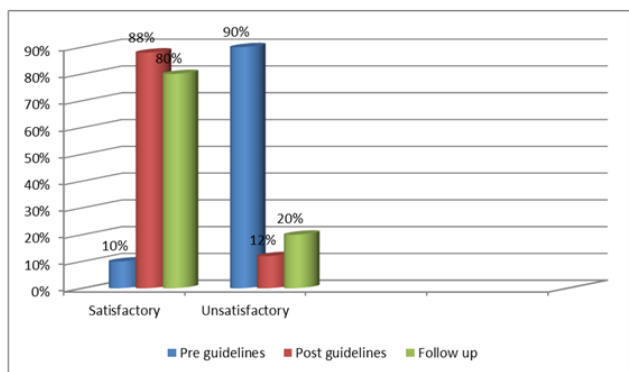
**Figure 1.** Distribution of children regarding the source of information about rabid animals and rabies (n=400).

Knowledge related to rabid animals and rabies	Pre-guideline		Post-guideline	Follow up		
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory
	%	%	%	%	%	%
Definition of rabid animals	5	95	88	12	85	15
Definition of rabies	3	97	95	5	92	8
Causative agent of rabies	40	60	95	5	92	8
Rabies transmission	37	63	96	4	95	5
Causes	5	95	88	12	85	15
Clinical manifestation in animals	35	65	88	12	85	15
Clinical manifestation in humans	10	90	90	10	85	15
diagnostic tests	5	95	88	12	85	15
Children's attitude towards animals	10	90	90	10	85	15
Medical treatment	40	60	90	10	90	10
Rabies prevention	4	96	95	5	90	10
Attitudes towards animals	5	95	88	12	85	15
Complications	20	80	90	10	88	12
Nursing care	30	70	95	5	92	8
T-test P value	X <sup>2</sup> =17.4 pre-guideline versus post-guideline					P value<0.001**
	X <sup>2</sup> =24.5 pre-guideline versus follow-up					
	X <sup>2</sup> =14.8 post-guideline versus follow-up					

**Table 2.** Percentage distribution of the studied sample of children according to their knowledge about rabid animals and rabies throughout the guideline phases (n=400).

Figure 2 describes the studied children's total knowledge score. The majority of them (90%) had unsatisfactory level before the guideline implementation, which improved for most of them (88%), to satisfactory knowledge immediately post guideline implementation. However, the same figure illustrates

that, the majority of studied children (80%) had satisfactory level in their total knowledge scores in follow up phase of guideline implementation, with a highly statistically significant difference ( $P < 0.0001$ ).



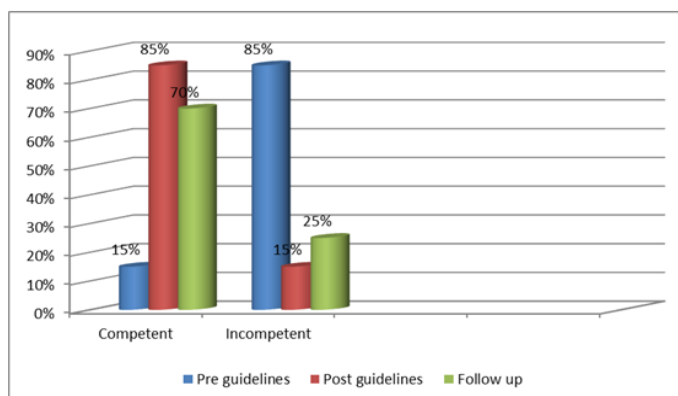
**Figure 2.** Percentage distribution of total knowledge score of the studied children about rabid animals and rabies throughout the guideline phases (n=400).

Table 3 points out that there are highly statistically significance improvements with in children`s practice post-immediately and at follow up guidelines implementation as regards all knowledge items about rabid animals and rabies.

Figure 3 illustrates that, as regards the studied children`s total practices score, most of the studied children (85%) had incompetent level before the guideline implementation, which improved for most of them (85%) to have competent practices immediately post guideline implementation. Furthermore, the same figure shows that, majority of studied children (85%) had competent level in their total scores of practices in the follow up phase of guideline implementation with a highly statistically significant difference (P<0.0001).

Practice related to rabid animals and rabies	Pre-guideline		Post-guideline	Follow up		
	Competent	Incompetent	Competent	Incompetent	Competent	Incompetent
	%	%	%	%	%	%
Hand washing before and after dealing with animals	12	88	80	20	87	22
Washing site of animal bits with water and soup	11	89	75	25	75	25
Follow up with doctor	75	25	96	4	96	4
Vaccination program for his animal	10	90	90	10	85	15
Vaccination yourself against rabies	8	92	85	15	82	18
Wound care with povidine iodine	28	72	94	6	92	8
T-test P value	X <sup>2</sup> =26.8 pre-guideline versus post-guideline					P-value<0.001**
	X <sup>2</sup> =52.5 pre-guideline versus follow-up					
	X <sup>2</sup> =22.5 post-guideline versus follow-up					

**Table 3.** Percentage distribution of studied children according to their practices about rabid animals and rabies throughout the guideline phases (n=400).



**Figure 3.** Percentage distribution of total practices score of the studied children about rabid animals and rabies throughout the guideline phases (n=400).

Table 4 points out that there is a highly statistically significant improvement in children's attitude post-guideline implementation. As children's positive attitude increased

increased from 20% pre guideline implementation to 90% and 85% post guideline implementation and follow up regarding rabid animals and rabies respectively.

Adolescent s' attitude	Total attitude		
	Pre-test	Post-test	Follow up
	%	%	%
Positive	20	90	85
Indifferent	40	10	12
Negative	40	0	3
T-test P value	T1=62.6* pre-versus post-guideline implementation		
	T2=16.2* post-versus follow-up guideline implementation		

**Table 4.** Distribution of studied adolescent students as regards their attitude about rabid animals and rabies throughout the guideline phases (n=400). \*: Significant  $P < 0.05$

Table 5 shows statistically significant positive correlation between knowledge scores and children's age and educational level at the pre-and follows up guideline's intervention phase ( $P < 0.001$ ). However, this table shows that there are statistically

insignificant correlations between practice and attitude scores and children's age and educational level at pre and follow up and immediately after guidelines intervention phases.

Variables		Age		Educational level		Residence		Socio-economic status	
		R	P	R	P	R	P	R	P
Knowledge	Pre program	0.72	>0.05*	0.248	0.001**	0.4	>0.05*	0.7	>0.05*
	Post program	0.544	0.001**	0.145	>0.05*	0.142	>0.05*	0.041	>0.05*
	Follow up	0.451	0.001**	0.364	0.001**	0.72	>0.05*	0.152	>0.05*
Practices	Pre program	0.22	>0.05*	0.42	>0.05*	0.21	>0.05*	0.031	>0.05*
	Post program	0.433	0.001**	0.405	0.001**	0.64	>0.05*	0.13	>0.05*
	Follow up	0.232	0.001**	0.224	0.001**	0.25	>0.05*	0.52	>0.05*
Attitude	Pre program	0.19	>0.05*	0.32	>0.05*	0.25	>0.05*	0.024	>0.05*
	Post program	0.426	0.001**	0.412	0.001**	0.74	>0.05*	0.12	>0.05*
	Follow up	0.312	0.001**	0.266	0.001**	0.43	>0.05*	0.72	>0.05*

**Table 5.** Correlation coefficient between Children's total educational guidelines implementation (pre, post and follow-up) characteristics and children's demographic (N=400). \*: Statistically insignificant ( $p > 0.05$ ); \*\*: Highly statistical significant correlation ( $P < 0.001$ ).

## Discussion

Rabies reasons viral encephalitis that kills over 50,000 people every year. The majority of mortalities are in developing countries of Africa and Asia. Most cases are due to national dog bites; as such, controlling the infection in the dog population is the most cost-effective way of controlling rabies [18]. Therefore, the current study aimed to evaluate effect of educational guidelines program on children's knowledge, practice regarding rabid animals and rabies.

The present study revealed that more than half children were female and their age ranged between 6-18 years with a mean age of  $12.9 \pm 2.1$  years. This result agrees with [19] who stated that, the mean age of school children was 13 years old with a range between eight and 15 years [19]. Additionally, Nilsson stated that, the age span of the students in this study was 8-18

years with a median age of 12 years [18]. Regarding level of education, half of them were primary education and had middle level of socio-economic status. This result disagrees with who indicated that, more than half had low level of socio-economic status [20]. As regards residence, 55.0% of them reside rural areas and 100% of them contact with animals. Also Nilsson found that more than one third of children dog owners [18]. Moreover, rabies is an important neglected disease, which kills around 59,000 people a year. Over a third of these deaths are in children less than 15 years of age [20].

Regards source of information about rabid animals and rabies, this study result revealed that, friends, parents and mass media were the source of information for less than three-quarters of studied sample (Figure 1). This may be due to that many children are ignore, afraid and shy about who asking for details resulting from closed communities and aggressive parents.



This result approves with the respondents have heard about rabies from various sources with majority being from friends, neighbors and the media [21]. Ghosh et al. found radio and television to account for 30% of respondents' sources of rabies information in Bangladesh. Therefore, it is important that rabies awareness education in community city be conducted using mass media such as radio and television broadcast [22].

The findings of this study revealed that the studied children's knowledge toward the rabid animals and rabies for more than two thirds of them was unsatisfactory knowledge before the guideline implementation, which improved for most of them to be satisfactory knowledge at post and follow up, as regards definition of rabid animals, definition of rabies, causative agent of rabies, rabies transmission, causes, clinical manifestation, diagnostic tests, children's attitude towards animals, rabies prevention, medical treatment, complications, and nursing care of rabies (Table 2). This may be due to that, the settings of the study do not follow any guideline or give opportunity for attending programs regarding rabid animals and rabies for children or some, most respondents believed that rabies does not affect humans or did not vaccinate their dogs which negatively affected their awareness and performance [23]. This finding was also supported by Illustrated that lack of knowledge about the nature of rabies disease and prophylaxis has contributed to increase of rabies related deaths [24]. These findings are congruent with those of in his study about: "A rabies lesson improves rabies knowledge amongst primary school children in Zomba, Malawi" which stated that knowledge of rabies and how to be safe around dogs was greater amongst school children who had received the lesson compared to school children who had not received the lesson [25]. In a similar study, done by Tiwari et al. about: "Knowledge, Attitudes and Practices (KAP) towards rabies and Free-Roaming Dogs (FRD) in Shirsuphal village in western India: A community based cross-sectional study" which found that, although the knowledge score about rabid animals and rabies was high, a comprehensive understanding of the disease was lacking. Concerted efforts to widen the knowledge about rabies and promote healthier practices towards FRD are recommended and need to educational program.

As regard total knowledge score of the studied children about rabid animals and rabies the majority of them had unsatisfactory level before the guideline implementation. This result supported by Tiwari et al. clarified that the lack of awareness about dog-bite related rabies in rural population of developing countries. However, there was satisfactory knowledge immediately post and follow up phase of guideline implementation. This finding agreed with [26]. Moreover, who stated that Knowledge of rabies and how to be safe around dogs increased following the lesson (both  $p < 0.001$ ), and knowledge remained higher than baseline 9 weeks after the lesson (both  $p < 0.001$ ). Form the researcher point of view improving children's knowledge regarding rabid animals and rabies was the main aim of the study and this improve reported in this study indicated the research hypothesis regarding knowledge was achieved.

The present study demonstrates that, the studied children's practices improved through guideline implementation phases as most of them were incompetent practices before the guideline implementation regarding rabid animals and rabies to hand washing before and after dealing with animals, washing site of rabid animals with water and soup, follow up with doctor, vaccination program for his animal, vaccination yourself against rabies and wound care with beta dine, which improved to reach the majority of them done practices immediately post guideline implementation and at follow up (Table 3). The researchers' opinion in that, lack of knowledge, incompetence in practice, could be attributed to not attending training courses in addition to inadequate health care facilities for rabies patients in local hospitals or schools and more believes that rabies does not affect humans or did not vaccinate roaming dogs, which lead to inappropriate nursing care. This finding was also supported by Hampson et al. who found that, both pre and post the lesson, more children answered that it was necessary to get vaccinated than to wash the wound, highlighting the need to raise common knowledge of this potentially lifesaving step. Additionally school based rabies education is an efficient way of reaching large numbers of children. Lessons comprising simple messages can improve rabies prevention through appropriate behavior, such as immediately washing bite wounds and seeking post-exposure vaccination.

The current study result showed that, there is an improvement in children's total knowledge and total practices and there were highly statistically significant differences ( $P < 0.001$ ) between pre, post, and follow up guideline implementation (Figures 2 and 3). The researchers attributed this finding to, educational programs for children is very important to them by promoting safety and children's knowledge about rabid animals behavior and how to avoid rabid animals bites important to prevent rabies cases in humans. In addition, annual re-education and reinforcement of the vital behaviors will provide children with the complete required knowledge and practices such as, appropriate changing the attitudes of children towards animals.

The current study showed that there is an improvement in children's total attitude immediately post and one month after guideline implementation as the positive attitude. There was a highly statistically significant difference ( $P < 0.001$ ) between pre, post, and follow up (Table 4). This may be due to that, educational guideline program had evident effect on enhancing children's performance through implementation phases. This finding was also agreed with Illustrated that education about rabid animals and their behavior has been proved to affect attitudes and consequently behavior towards animals in other situations [18].

Educational program play an active role in helping their children and caring with them effectively. Wherever, training children about knowledge, attitude and practice related to rabid animals and rabies as clinical manifestation of rabid humans or rabid animals, how to deal with animals, rabid animals behavior, hand washing before and after dealing with animals, washing site of rabid animals with water and soup, follow up with doctor, vaccination program for his animal, vaccination

yourself against rabies and wound care with beta dine. Children taught how to gently dealing and encouraged to be daily behavior. Additionally although the knowledge score about rabies was high, a comprehensive understanding of the disease was lacking [15]. Concerted efforts to widen the knowledge about rabies and promote healthier practices towards free roaming dogs are recommended.

As regard to the correlation between total knowledge of children and their personal characteristics, the current result revealed that there was a statistically significant positive correlation between total knowledge of children with their age, and educational qualification at the pre-and follow up guideline's intervention phase. This finding is consistent with who conducted a study "Community-based study on knowledge, attitudes and perception of rabies in Gelephu, South-Central Bhutan" which stated that Multivariable logistic regression model showed that better knowledge about rabies was predicted by gender, educational level and dog ownership status of the respondents and demonstrated that positive correlation between children's level of education and knowledge, attitude and practice of studied sample. Illustrated that multivariable logistic regression models were constructed and the knowledge of the rural residents of Shirsuphal village was found to be significantly influenced by family size. In addition, knowledge and perception of rabies was high among the respondents.

The researcher point of view suggested that children should be aware of knowledge, attitude and practice requiring rabid animals and rabies because child safety was the first responsibility of health care teams and governments. This further support the study hypothesis. Augmenting the results of current study, it evident that education and training courses has a vital role in improving children's knowledge, attitude and practice toward rabid animals and rabies education. Moreover, the result of the present study revealed that children's knowledge, attitude and practice were improved after program implementation. This could attribute to the fact that the importance and effectiveness of training course in enhancing children's knowledge, attitude and practice which play significant role in the quality of care providing and effective outcomes. Community knowledge, attitudes and practices are important together for prevention of human deaths due to rabies and for control of the disease in animals.

## Conclusion

Based on the results of the present study, it can be concluded that, three were highly statistically significance improvements in children's knowledge, attitude and practice post-immediately and at follow up guidelines implementation. Moreover, there were a significant positive correlation between mothers' knowledge and practice age and level of education at pre and follow up and immediately after guidelines intervention phases.

## Recommendation

In the light of the current study, the following recommendations are suggested:

- Provide continuous education and training for children regarding rabies.
- Early education and intervention to avoid further complication and handicaps.
- Further study can be replicated on other schools using a large sample size to clinically verify the effectiveness of the educational guidelines and generalize the results of the study.

## References

1. Ahmed T, Asghar MW, Mushtaq MH. A short report on epidemiological investigation of dog bite cases in association with temperature rise as a part of climate change. *Adv Life Sci* 2019; 6(3): 106-109.
2. Ahmed T, Hussain S, Rinchen S, et al. Knowledge, Attitude and Practice (KAP) survey of canine rabies in Khyber Pakhtunkhwa and Punjab province of Pakistan. *BMC Public Health* 2020; 20(1): 1-12.
3. Bailey JLB, Gamble L, Gibson AD, et al. A rabies lesson improves rabies knowledge amongst primary school children in Zomba, Malawi. *PLoS Negl Trop Dis* 2018; 12(3): e0006293.
4. Bannazadeh Baghi H, Alinezhad F, Kuzmin I, et al. A perspective on rabies in the Middle East beyond neglect. *Veterinary Sciences* 2018; 5(3): 67.
5. Barecha CB, Girzaw F, Kandi RV, et al. Epidemiology and public health significance of rabies. *Persp Med Res* 2017; 5: 55–67.
6. Bouaddi K, Bitar A, Bouslikhane M, et al. Knowledge, attitudes, and practices regarding rabies in Jadida region, Morocco. *Veterinary sciences*, 2020; 7(1): 29.
7. Burdon BJL, Gamble L, Gibson AD, et al. A rabies lesson improves rabies knowledge amongst primary school children in Zomba. *PLoS Negl Trop Dis* 2018; 12(3): e0006293.
8. Depani SJ, Kennedy N, Mallewa M, et al. Evidence of rise in rabies cases in Southern Malawi—better preventative measures is urgently required. *Malawi Medical Journal* 2012; 24(3): 61-64.
9. Dhand NK, Gyeltshen T, Firestone S, et al. Dog bites in humans and estimating human rabies mortality in rabies endemic areas of Bhutan. *PLoS Negl Trop Dis* 2011; 5(11): e1391.
10. Dhand NK, Rai BD, Tenzin S, et al. Community-based study on knowledge, attitudes and perception of rabies in Gelephu, south-central Bhutan. *Int Health* 2012; 4(3): 210-219.
11. Dzikwi AA, Bello HO, Umoh JU. Impact of rabies education on the knowledge of the disease among primary school children in Samaru, Zaria, Nigeria. *Semantic Scholar* 2015; 1(10): 56-62.

12. Fooks AR, Banyard AC, Horton DL, et al. Current status of rabies and prospects for elimination. *The Lancet* 2014; 384(9951): 1389-1399.
13. Ghosh S, Chowdhury S, Haider N, et al. Awareness of rabies and response to dog bites in a Bangladesh community. *Vet Med Sci* 2016; 2(3): 161-169.
14. Hampson K, Dobson A, Kaare M, et al. Rabies exposures, post-exposure prophylaxis and deaths in a region of endemic canine rabies. *PLoS Negl Trop Dis* 2008; 2(11): e339.
15. Hatz CF, Kuenzli E, Funk M. Rabies: Relevance, prevention, and management in travel medicine. *Infec Dis Clin* 2012; 26(3): 739-753.
16. Hossain M, Ahmed K, Bulbul T, et al. Human rabies in rural Bangladesh. *Epid Infec* 2012; 140(11): 1964-1971.
17. Jemberu WT, Molla W, Almaw G, et al. Incidence of rabies in humans and domestic animals and people's awareness in North Gondar Zone, Ethiopia. *PLoS Negl Trop Dis* 2013; 7(5): e2216.
18. Sharaf MA, Hashem HE, Ahmed WO. Simultaneous use of factor XIII and fibrin degradation products in diagnosing early cases of NEC and neonatal SEPSIS. *J Sci Res Medi Biolo Sci* 2021; 2(4): 1-10.
19. Nilsson M. Effect of rabies education programs on rabies awareness, attitudes towards dogs and animal welfare among children in Lilongwe, Malawi. 2014; 26: 1-15.
20. Ntampaka P, Nyaga PN, Niragire F, et al. Knowledge, attitudes and practices regarding rabies and its control among dog owners in Kigali city, Rwanda. *PloS One* 2019; 14(8): e0210044.
21. Tenzin S, Dhand NK, Gyeltshen T, et al. Dog bites in humans and estimating human rabies mortality in rabies endemic areas of Bhutan. *PLoS Negl Trop Dis* 2011; 5:e1391. Tenzin S, Tsheten K. Community-based study on knowledge, attitudes and perception of rabies in Gelephu, south-central Bhutan. *Int Health* 2012; 4(3): 210-219.
22. Tiwari HK, O'Dea M, Robertson, ID, et al. Knowledge, Attitudes and Practices (KAP) towards rabies and Free-Roaming Dogs (FRD) in Shirsuphal village in western India: A community based cross-sectional study. *PLoS Negl Trop Dis* 2019; 13(1): e0007120.
23. <https://apps.who.int/iris/handle/10665/272364>
24. World Health Organization. Driving progress towards rabies elimination: new WHO recommendations on human rabies immunization and results of Gavi's learning agenda on rabies and 2nd international meeting of the Pan-African Rabies Control Network (PARACON): meeting report, 12-14 September 2018, Johannesburg, South Africa. World Health Organization 2019.
25. Alhusam S. Clinical conditions and risk factors of *Acinetobacter baumannii* producing metallo beta-lactamases among hospitalized patients. *Journal of Scientific Research in Medical and Biological Sciences* 2021; 2(4): 11-17.
26. [https://www.who.int/rabies/resources/SEA\\_CD\\_278\\_FAQs\\_Rabies.pdf](https://www.who.int/rabies/resources/SEA_CD_278_FAQs_Rabies.pdf)

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