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Rabies-Related Knowledge, Attitudes, and Practice Among Nomads in South Khorasan, Iran: A Descriptive-Correlational Study

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Abstract

Background and Objectives: Rabies is among the oldest known zoonoses. It has a high mortality rate, particularly in developing countries and in rural areas. Rabies prevention and management necessitates adequate information about public rabies-related knowledge and behavior. The present study was done to assess rabies-related knowledge, attitudes, and practice among nomads in South Khorasan province, Iran.

Methods: This cross-sectional descriptive study was conducted in 2015 on 318 nomads. Sampling was done through multi-stage sampling. A researcher-made 36-item instrument was used for data collection. The data were entered in the SPSS software (v. 16) and analyzed through the Mann-Whitney U, Kruskal-Wallis test, and Spearman correlation analysis, at a significance level of less than 0.05.

Results: A large number of participants had limited knowledge (139 cases; 43.4%), negative attitudes (139 cases; 42.9%), and moderate-level practice (183 cases; 57.5%) regarding rabies. There were significant positive correlations between knowledge and attitudes ($r = 0.58$; $P < 0.001$), knowledge and practice ($r = 0.58$; $P < 0.001$), and attitudes and practice ($r = 0.56$; $P < 0.001$). Moreover, rabies-related knowledge, attitudes, and practice had a significant relationship with age and educational status ($P < 0.05$).

Conclusions: This study showed that most nomads in South Khorasan had poor rabies-related knowledge, attitudes, and practice. Therefore, educational strategies are needed to improve their rabies-related knowledge, attitude, and practice, in order to prevent rabies.

Keywords: Rabies, Knowledge, Attitude, Practice, Nomads

1. Introduction

Rabies is an important zoonosis manifested by acute and fatal encephalitis. The cause of the disease is a neurotropic virus from the rhabdoviridae family and the lyssavirus genus. Rabies has a global distribution and together with poliomyelitis and smallpox, has been among the most terrific illnesses in the history of medicine. All human beings and almost all mammals are sensitive to rabies (1-5). Dogs, as a reservoir of rabies, have the most principal role in rabies transmission to humans. Other mammals and warm-blooded animals can also be infected accidentally (6). Rabies is transmitted mainly through the bite of a rabid animal, infected mucosal tissues or devices, infected air, organ transplantation, and the placental route (7). Rabies is the only zoonosis, which is always fatal, so that its mortality rate after the appearance of symptoms is 100% (3, 6, 8). Due to its high mortality and enormous healthcare costs, rabies is a disease of paramount importance (9). The most important measures for rabies prevention are vaccination before and after bite and immediate washing of the bite site (5, 8, 10).

The world health organization reported that 3 billion people, i.e. half of the global population, live in countries where dogs and wild animals are infected with rabies. The organization also noted that every 2 seconds, 1 animal bite occurs and every 30 minutes, 1 rabies-induced death takes place around the world (11), resulting in 50,000 deaths every year. Rabies-induced deaths occur particularly in Asian and African countries (12), while 30% to 50% of the deaths take place among children with an age of less than 15 years (12). Annually, 10 million people are infected with rabies and receive rabies treatments. Around 96.5% of rabies-related healthcare costs are spent in developing countries (1, 13). Therefore, despite its preventability, rabies is still a major health challenge in most countries, particularly in eastern Mediterranean countries like Iran. The center for

disease control and prevention recommend passengers to receive rabies vaccine before travelling to these countries (6, 14).

Rabies in Iran is a significant endemic zoonosis. Laboratory studies show that both tame and wild animals in Iran are infected with rabies (9, 15). Rabies is prevalent in almost all provinces of Iran, however, its prevalence in Northern provinces is higher, due to more abundant wildlife in these provinces, and in border provinces, due to their adjacency to other rabies endemic countries, such as Afghanistan, Pakistan, and Iraq (16). According to reports of the Center for Communicable Disease Management of Iran, 162,870 animal bites occurred during year 2015 in Iran. This rate in South Khorasan province was 1566. Moreover, a single case of rabies-induced death of an 11-year-old child happened after a fox bite in 2010 (17).

Due to improved public knowledge about rabies and free rabies treatment, the incidence of the disease has significantly decreased in the recent years around the world. Knowledge is considered as one of the most important factors behind rabies prevention. The best way to improve knowledge is public education and the first step in education is to assess audience knowledge, attitudes, and practice (KAP). Such assessments are widely performed to determine public knowledge, cultural beliefs, and behavioral patterns, and subsequently improve KAP regarding different health problems and conditions in different areas of the world (18). For instance, a study from Tanzania showed that improvement of public knowledge about rabies prevention and control significantly improved preventive behaviors (18). Other studies in other areas of the world also reported the positive effects of education on rabies prevention and control (19, 20). However, there is limited information about rabies-related KAP in Iran. Therefore, given the greater prevalence of rabies in rural areas (21), the present study was done to assess rabies-related KAP among nomads in South Khorasan province of Iran.

2. Methods

This cross-sectional descriptive study was conducted during year 2015 on 318 nomads. Sampling was done through multi-stage sampling, in which from 11 counties in South Khorasan province, 2 counties were randomly selected through simple random sampling. Then, based on the number of nomads in each county, a convenience sample of nomads was selected. Eligibility criteria were an age of 15 or more and consent for participation.

A 4-part researcher-made instrument was used for data collection. The first part was a questionnaire on demographic characteristics, such as age, gender, educational status, and the source of obtaining rabies-related information. The second part was a knowledge questionnaire with 17 questions about the nature, manifestations, and prevention of rabies. The possible answers to these questions were "Right", "Wrong", and "I don't know", which were respectively scored 1, 0, and 0, yielding a total knowledge score of 0 to 17. The third part contained 8 items on attitude towards rabies and its prevention. The 3 answers to attitude items were "agree" (scored +1), "disagree" (scored -1), and "I have no opinion" (scored 0). The fourth part was related to practice and included 11 multiple-choice questions. Each item only had 1 correct answer. Correct and wrong answers to practice items were scored 1 and 0, respectively. Therefore, the total practice score could range from 0 to 11. The scores of the KAP questionnaires were categorized to 3 categories, namely poor (scores less than 50% of the total scores), moderate (scores of 50% to 75% of the total scores), and good (scores more than 75% of the total scores). The content validity of the instrument was confirmed by 10 faculty members of Birjand University of Medical Sciences, Birjand, Iran. Its reliability was also assessed via the test-retest method; 30 nomads completed this twice with a 2-week interval. The test-retest correlation coefficient for the instrument and its KAP parts were 0.84, 0.85, 0.82, and 0.87, respectively.

After obtaining necessary permissions and approvals for the study from Birjand University of Medical Sciences and local healthcare centers in Birjand, Iran, the researchers referred to nomadic areas and collected the study data. The data were then entered in the SPSS software (v. 16) and were analyzed through the Mann-Whitney U and the Kruskal-Wallis tests and the Spearman correlation analysis at a significance level of less than 0.05.

3. Results

Among 318 nomads, who participated in this study, 198 (62.3%) were male and 120 (37.7%) female. They were aged 15 to 79 years old with a mean of 39.37 ± 14.97. Participants were mostly illiterate or had primary education (64.46%). Thirty-eight participants (11.94%) had a previous history of animal bite, 32 of them (84.21%) had been bitten by dogs and 21 (55.26%) had referred to healthcare centers to receive rabies treatments. Around 69.2% of participants (220 cases) had already heard about rabies from the radio and television (60 cases; 27.27%), healthcare providers (99 cases; 45%), books (26 cases; 11.81%), or other sources (35 cases; 15.92%). Around 55.3% of the participants (176 cases) had a dog, 64.2% of whom (113 cases) did not use a dog collar and 59.6% (105 cases) had not vaccinated their dogs against rabies.

The mean scores of participants' KAP were 8.57 ± 5.00, 3.61 ± 3.03, and 6.04 ± 2.23, respectively. Table 1 shows the different categories of participants' KAP. The Spearman correlation analysis showed a significant positive correlation between knowledge and attitude (r = 0.58; P < 0.001), knowledge and practice (r = 0.58; P < 0.001), and attitude and practice (r = 0.56; P < 0.001). Moreover, participants' age was inversely correlated with their knowledge (r = -0.20; P < 0.001), attitudes (r = -0.12; P = 0.03), and practice (r = -0.18; P = 0.001). The results of the Kruskal-Wallis test also showed the significant relationships of participants' educational status and their rabies-related KAP. Post hoc analyses revealed that the mean scores of knowledge and practice among illiterate participants were significantly lower than literate participants with different educational levels (P < 0.001). The mean score of knowledge among participants with primary and junior secondary education was also significantly lower than those with senior secondary and higher education (P < 0.05). Moreover, the mean score of attitude among illiterate participants was significantly less than those with primary (P < 0.001) and junior secondary education (P < 0.05; Table 2). Meanwhile, the Mann-Whitney U test revealed no significant difference between male and female participants, respecting their KAP scores (P > 0.05).

Table 1. Rabies-Related Knowledge, Attitude and Practice Among Nomads in South Khorasan

KAP	No. (%)
Knowledge	
Poor	139 (43.4)
Moderate	115 (36.2)
Good	64 (20.4)
Attitude	
Poor	49 (15.5)
Moderate	137 (42.9)
Good	132 (41.6)
Practice	
Poor	84 (26.4)
Moderate	183 (57.5)
Good	51 (16)

4. Discussion

The present study was done to assess rabies-related KAP among nomads in South Khorasan province of Iran. Findings indicated that most participants had limited knowledge (43.4%), negative attitudes (42.9%), and moderate-level practice (57.5%) regarding rabies. The literature review showed that none of the previous studies assessed rabies-related KAP in Iran. Yet, a study from urban and rural areas of Tanzania showed that most participants had limited knowledge about rabies and its prevention and control (18). Another study on French travelers also showed that they had poor KAP regarding rabies and its prevention and treatment (22). Contrarily, a study from Ethiopia revealed that animal bite victims had good knowledge about the role of dogs in rabies transmission and also about rabies symptoms in humans and animals. However, they had poor attitudes and practice regarding safe animal management and post-bite measures (23). This contradiction is due to the fact that the Ethiopian study was conducted on 384 people with animal bite, who had attended an anti-rabies health center and therefore they had some information about rabies and its management, while only 11.94% of the current participants had a previous history of animal bite. Another study from Ethiopia on 1,260 households showed that most of them had moderate knowledge and good attitudes and practice regarding rabies (24). The contradiction between the findings of this Ethiopian study and the current findings may be due to the differences in the instruments and the samples of these studies. A study from Sri Lanka also reported great public knowledge about rabies due to the wide accessibility of health-related information through media and healthcare systems (25). Most people in the study from Sri Lanka had immediately referred to healthcare centers after getting bitten (25), while participants in a study from India had mostly used home remedies, such as applying red pepper to the bite site (26).

Among 11.94% of the current participants, who had a history of animal bites, 55.26% had referred to healthcare centers to receive rabies treatments and none of them had washed the bite site for 15 to 20 minutes before seeking medical help. Moreover, 59.6% of participants had not vaccinated their dogs against rabies. Similarly, a study from Sri Lanka showed that the minority of people had vaccinated their dogs against rabies (25).

The study findings also showed direct correlations among KAP. Another study also reported strong direct correlations between knowledge and attitude, knowledge and practice, and attitude and practice (24). Knowledge can affect and promote behavior, including health-related behaviors (27). Similarly, attitude can affect disease prevention practice and behavior (24). However, knowledge and attitude are not necessarily the prerequisites for behavior, in that sometimes a behavior is shown without having adequate knowledge or positive attitude. Similarly, sometimes individuals adopt a certain attitude and show a behavior without having adequate knowledge. Therefore,

Table 2. Comparison of Participants' Knowledge, Attitude and Practice Mean Scores Based on Educational Status[a]

KAP/Educational Status	N	Knowledge	Attitude	Practice
Educational status		< 0.001	< 0.001	< 0.001
Illiterate	106	5.6 ± 5.08	2.61 ± 3.01	4.88 ± 2.13
Primary	99	9.46 ± 4.09	4.25 ± 2.67	6.48 ± 2.18
Junior secondary	77	9.84 ± 4.17	3.79 ± 2.41	6.7 ± 1.85
Senior secondary and higher	36	11.4 ± 3.61	3.19 ± 2.16	6.81 ± 1.83

[a]Values are expressed as mean ± SD.

knowledge and attitude can precede behavior or come after it. However, when a given behavior is shown based on previous knowledge and attitude, the behavior is expected to be shown repeatedly because behavior is the result of decision and decision is based on knowledge and attitude. In other words, the relationships among KAP are mostly logical and hierarchical (28).

The current findings also indicated that participants with higher educational status obtained higher KAP scores. Two previous studies also reported the same finding (18, 24). As mentioned above, behavior is based on decision, decision is based on knowledge, and knowledge is affected by literacy. Another finding of the present study was significantly lower KAP mean scores in older participants. This finding can be attributed to the lower educational status of older participants. This is in line with the findings reported by previous studies (1, 24). However, contrary to the findings of 3 earlier studies (1, 18, 24), the current findings showed no significant relationships between gender and KAP. Those studies attributed male's better KAP to their wider outdoor activities (1, 18, 24). The contradiction between the current findings and the findings reported by previous studies may be due to the direct engagement of nomadic females in outdoor activities, such as animal husbandry.

One of the limitations of the present study was the data collection, which was through a self-reported instrument, and thus the responses could be affected by respondents' immediate psychological status. The cross-sectional design of the study was its other limitation.

4.1. Conclusions

This study showed that nomads in South Khorasan had poor rabies-related KAP. Therefore, different educational strategies are needed to improve their rabies-related knowledge and thereby, their attitude and practice, in order to prevent rabies. Healthcare providers in rural healthcare centers can play a significant role in improving nomads' rabies-related knowledge. Of course, quality continuing education programs are needed for healthcare providers in rural areas in order to improve their knowledge about rabies.

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