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RESEARCH ARTICLE

Analysis of Factors Related to the Management of Rabies-Transmitting Animal Bite Cases in the Working Area of Lappadata Health Center, Central Sinjai Subdistrict, Sinjai Regency

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ABSTRACT

Rabies is a critical zoonotic disease caused by the rabies virus, primarily transmitted through the bites or saliva of infected animals, such as dogs, cats, and monkeys. Despite control efforts, rabies cases in South Sulawesi, particularly in Sinjai Regency, continue to rise. This study investigates the factors affecting the handling of rabies-transmitting animal (RTA) bites in the Lappadata Health Center's area. This study aims to analyze factors associated with the management of RTA bite cases in Sinjai Tengah District, Sinjai Regency.A cross-sectional study with 278 purposively sampled respondents was employed in this study. Data analysis was performed using SPSS (version 26), focusing on knowledge, attitudes, cultural practices, cross-sectoral roles, and healthcare worker involvement.The analysis revealed significant relationships between several variables and the handling of rabies-transmitting animal bite cases. Significant factors influencing case management included knowledge ($p = 0.001$), attitudes ($p = 0.001$), cultural practices ($p = 0.001$), and cross-sectoral involvement ($p = 0.009$). Knowledge emerged as the most crucial factor, with a 93.0% likelihood of correct case handling, underscoring the importance of community education and engagement. This study concludes that enhancing public knowledge, fostering positive attitudes, and promoting cross-sectoral collaboration are vital for effective RTA case management and reducing rabies incidence.

INTRODUCTION

Rabies is a contagious disease caused by the rabies virus, a member of the Rhabdovirus family. This virus is found in the saliva of infected animals and is transmitted through bites or saliva exposure, primarily by dogs, cats, and monkeys. Infected animals become aggressive and tend to attack and bite humans (Abidin & Budi, n.d.).

Rabies has spread globally to all continents except Antarctica. In 2020, over 95% of human rabies cases, approximately 164,403, occurred in Asia and Africa. Annually, several Asian countries report significant human rabies cases: India (20,000), China (2,500), the Philippines (20,000), Vietnam (9,000), and Indonesia (1,168). Rabies-related deaths in Asia total around 50,000 per year, including 20,000-30,000 in India, 2,500 in China, 9,000 in Vietnam, 200-300 in the Philippines, and 143 in Indonesia, with a 100% Case Fatality Rate(Firmansyah et al., 2022; Kavoosian et al., 2023).

In Indonesia, the spread of rabies is closely related to community understanding, awareness, participation, and behavior. Public knowledge and understanding of rabies control and eradication

are crucial. The incidence of rabies in animals and humans in an area is influenced by public knowledge about the dangers of rabies and awareness of preventive measures. Additionally, individual attitudes and behaviors towards rabies-transmitting animals contribute significantly to rabies prevention (Devira et al., 2023; Jam et al., 2012).

Research by Rehman et al. (2021) assessed the knowledge, attitudes, and practices (KAP) related to rabies in three provinces of Indonesia and found that most participants had sufficient knowledge and appropriate practices regarding rabies. However, there were gaps in knowledge and practices, particularly concerning rabies vaccination, medical treatment, and awareness campaigns(Rehman et al., 2021).

Preliminary observations with residents in the Lappadata Health Center's working area indicated that most residents had only elementary education, with few graduating from junior high or high school. Nearly all residents were farmers or gardeners, and the distance of the gardens from the village meant that heads of families often stayed overnight there, making them the first to notice if a family member fell ill. Mothers played a crucial role in maintaining family health, influenced by factors such as education, knowledge, age, culture, and tradition. External factors included the accessibility of health facilities and the influence of health workers or local community leaders.

The high mortality rate from Lyssa virus diseases is due to low public knowledge about rabies and preventive measures after RTA bites. Many people do not immediately seek medical care after being bitten. Currently, there is no effective treatment for rabies, but the disease can be prevented through vaccination and early RTA bite management(Syahfitri, 2023).

Traditional treatments for RTA bites often involve consulting shamans instead of healthcare professionals. Treatment typically includes applying leaves, kerosene, diesel, or herbal plants to the bite wound without seeking medical care at health centers. Most residents had not received prior rabies education and were unaware of initial handling procedures for dog or other animal bites. In the Lappadata Health Center's working area, traditional treatment with leaves on RTA bite wounds is still practiced, resulting in unreported cases. Therefore, local culture also plays a role in rabies prevention efforts, though knowledge remains the primary factor in rabies control actions. Knowledge significantly influences attitudes, behaviors, and actions. Health workers play a role in providing information about health problems and their prevention and management. To enhance public understanding and positive attitudes towards disease prevention, effective health information dissemination is necessary (Jurnal et al., 2023).

Efforts to raise public awareness for rabies prevention through increased knowledge and practice are essential. Educating dog owners about routine vaccinations and sterilization as population control measures is vital (Tiwari et al., 2019). A one-health approach is needed for rabies infection control, involving collaboration between humans, animals, and the environment(Standley et al., 2019).

According to Subrata et al. (2020), a lack of coordination among stakeholders can hinder case management(Subrata et al., n.d.). In RTA cases, health centers must coordinate with veterinary services for observation and confirmation of rabies to promptly administer complete post-exposure prophylaxis. Comprehensive control efforts, including education by all relevant stakeholders (Health Office, Education Office, Livestock Office, Tourism Office, Veterinary Research Centers, etc.), are necessary to achieve rabies-free status by 2030.

Education provides individuals with extensive knowledge and well-developed thought processes, increasing awareness of positive health behaviors. Notoadmodjo (2003) states that education aims to impart knowledge, leading to positive behavioral changes. The increasing RTA cases at Lappadata Health Center each year prompted this study on "Analysis of Factors Related to the Management of Rabies-Transmitting Animal Bite Cases in the Working Area of Lappadata Health Center, Sinjai Regency." This study aims to identify the factors influencing RTA case management.

This study aims to specifically identify and analyze the factors associated with the management of rabies-transmitting animal (RTA) bite cases within the Lappadata Health Center's work area in Sinjai Tengah District, Sinjai Regency, by measuring the impact of knowledge, attitudes, cultural practices, and cross-sectoral roles on effective case handling. The goal is to determine these factors within a six-month research period.

MATERIALS AND METHODS:

This study was conducted using a cross-sectional design aimed at analyzing factors associated with the management of rabies-transmitting animal (RTA) bite cases in the Lappadata Health Center's work area, Sinjai Tengah District, Sinjai Regency.

Study Design and Setting:

This cross-sectional study was conducted in the Lappadata Health Center area, located in the Sinjai Tengah District, Sinjai Regency, from June to July 2024. The area was chosen due to its high incidence of RTA bites.

Population and Sample:

The study population consisted of residents in the Lappadata Health Center's work area who owned dogs or other potential rabies-transmitting animals. The sample size was calculated using a standard formula for cross-sectional studies, resulting in 278 respondents. Purposive sampling was used to select participants who met the inclusion criteria, such as being over 18 years of age, owning a pet capable of transmitting rabies, and having experienced or managed an RTA bite case.

Inclusion and Exclusion Criteria:

Inclusion criteria included adults aged 18-59 years who owned pets capable of transmitting rabies and resided in the study area. Exclusion criteria involved individuals with severe illnesses or communication barriers that would impede effective participation in the study.

Data Collection:

Data were collected through structured interviews using a pre-tested questionnaire. The questionnaire covered demographic information, knowledge about rabies, attitudes toward RTA bite management, cultural practices, and cross-sectoral involvement in managing rabies cases. Data collection was conducted by trained interviewers who visited respondents' homes.

Data Analysis:

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Univariate analysis was used to describe the demographic characteristics of the respondents. Bivariate analysis (using chi-square tests) assessed the relationship between independent variables and the management of RTA bite cases. Multivariate analysis (logistic regression) identified the most significant predictors of effective case management, with a significance level set at $p < 0.05$.

RESULTS AND DISCUSSION:

Table 1: Distribution of Respondent Characteristics at the Lappadata Health Center, Sinjai Regency in 2024

Respondent Characteristics	Total	
	n	%
Sex		
Male	80	28.8
Female	198	71.2
Age		
20-35 year old	97	34.9

35-45 year old	59	21.2
>45 year old	122	43.9
Education		
No formal education	23	8.3
Elementary school	75	27.0
Junior High School	46	16.5
Senior High School	124	44.6
University	10	3.6
Occupation		
Unemployed	18	6.5
Housewive	195	70.1
Enterpreneur	10	3.6
Civil Servant	6	2.2
Farmer	49	17.6
Subdistrict		
Samaenre	67	24.1
Mattunreng Tellue	44	15.8
Baru	64	23.0
Kanrung	74	26.6
Saontare	29	10.4

The study included a total of 278 respondents from the Lappadata Health Center area in Sinjai Regency. The distribution of respondent characteristics is summarized in Table 1. The majority of respondents were female, accounting for 71.2% of the sample, while males made up 28.8%. Regarding age distribution, the largest age group was those over 45 years old (43.9%), followed by the 20-35 year age group (34.9%), and the 35-45 year age group (21.2%). In terms of education, 44.6% of respondents had completed senior high school, making it the most common educational level among the participants. This was followed by elementary school graduates at 27.0%, junior high school graduates at 16.5%, and a small percentage of respondents had no formal education (8.3%) or had attended university (3.6%). The primary occupation of the respondents was housewives, comprising 70.1% of the sample. Farmers represented 17.6% of the respondents, while smaller percentages were unemployed (6.5%), entrepreneurs (3.6%), and civil servants (2.2%). Geographically, the respondents were distributed across several subdistricts within the Lappadata Health Center's jurisdiction. The highest number of respondents came from Kanrung (26.6%), followed by Samaenre (24.1%), Baru (23.0%), Mattunreng Tellue (15.8%), and Saontare (10.4%).

Table 2: Frequency Distribution Based on Research Variables at the Lappadata Health Center, Sinjai Regency in 2024

Respondent Characteristics	**RTA Management**				***P value***
	Appropriate		**Inappropriate**		
	n	%	n	%	
Knowledge					
Adequate	80	93.0	6	7.0	0.001
Inadequate	66	34.4	126	65.6	
Attitude					
Positive	120	91.6	11	8.4	0.001
Negative	26	17.7	121	83.4	
Culture					
Influential	120	81.6	27	18.4	0.001
Not influential	26	19.8	105	80.2	
Cross-sector role					
Involved	123	56.7	94	43.3	

Not involved	23	37.7	38	62.3	0.009
Healthcare professional role					
Influential	107	49.8	108	50.2	0.090
Not influential	39	61.9	24	38.1	

Table 2 displays the frequency distribution of respondents based on key research variables related to the management of rabies-transmitting animal (RTA) bite cases at the Lappadata Health Center. The analysis reveals significant associations between several variables and the appropriateness of RTA management. Notably, knowledge emerged as a crucial factor, with 93.0% of respondents possessing adequate knowledge managing the cases appropriately, compared to only 34.4% among those with inadequate knowledge (p = 0.001). Similarly, attitudes played a significant role, as respondents with a positive attitude had a 91.6% likelihood of managing cases correctly, while only 17.7% of those with a negative attitude managed the cases appropriately (p = 0.001). Cultural influence also proved to be a significant determinant, with 81.6% of respondents in culturally supportive environments managing cases appropriately, contrasted by 19.8% in less culturally influenced settings (p = 0.001).

Table 3 : Results of Logistic Regression Test of Variables

Variables in the Equation	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Knowledge	3.110	.545	32.583	1	.000	22.427
Attitude	22.799	10011.737	.000	1	.998	7969244831.000
Culture	-19.024	10011.737	.000	1	.998	.000
Cross-sector role	.520	.521	.994	1	.319	1.682
Constant	-12.254	1.496	67.122	1	.000	.000
a. Variable(s) entered on step 1: Knowledge, Attitude, Culture, Cross-sector role						

Table 3 presents the results of the logistic regression analysis conducted to identify the most significant predictors of appropriate rabies-transmitting animal (RTA) management among the variables studied. The analysis revealed that knowledge was the most influential variable, with a statistically significant p-value of 0.000 and an odds ratio (Exp(B)) of 22.427, indicating that respondents with adequate knowledge were over 22 times more likely to manage RTA cases appropriately compared to those with inadequate knowledge. In contrast, the attitude and culture variables, despite showing some association in the bivariate analysis, did not emerge as significant predictors in the multivariate model, with p-values of 0.998 for both. The odds ratios for these variables were exceedingly high or low, indicating potential issues with the data or model fit. Specifically, the attitude variable had an Exp(B) of 7969244831.000, and culture had an Exp(B) of 0.000, both of which suggest that these factors did not contribute meaningfully to predicting the outcome when considered alongside other variables.The **cross-sector role** variable also did not show a significant contribution to the model, with a p-value of 0.319 and an Exp(B) of 1.682, suggesting that cross-sector involvement alone was not a strong predictor of appropriate RTA management in this context. The constant term in the model was significant (p = 0.000), reinforcing the importance of the base likelihood of appropriate case management without the influence of the variables considered. Overall, the results underscore the critical role of knowledge in ensuring effective RTA management, while other factors, such as attitude, culture, and cross-sector involvement, may require further exploration or more refined measures in future studies.

The present study aimed to identify and analyze factors associated with the management of rabies-transmitting animal (RTA) bite cases at the Lappadata Health Center in Sinjai Regency. The findings highlight the crucial role of knowledge in determining appropriate case management, a result that aligns with existing literature emphasizing the importance of public awareness in controlling zoonotic diseases like rabies.

The strong association between adequate knowledge and effective RTA management observed in this study is consistent with findings from similar studies. Abidin and Budi (2020) also reported that higher levels of knowledge significantly improved the handling of rabies cases(Abidin & Budi, n.d.). This consistency suggests that knowledge remains a universally critical factor in rabies prevention, reinforcing the need for widespread educational campaigns.The significant association between adequate knowledge and appropriate RTA management observed in this study also aligns with the findings of Rehman et al. (2021), who reported similar trends in three provinces of Indonesia(Rehman et al., 2021). They highlighted that gaps in knowledge, particularly regarding rabies vaccination and medical treatment, significantly influenced the management outcomes. This comparison suggests that across different regions, enhancing knowledge remains a universal priority for effective rabies control.

However, the lack of significant impact from attitudes and cultural practices in the logistic regression model contrasts with earlier studies, such as those by Tiwari et al. (2019), who found that positive attitudes and supportive cultural norms played substantial roles in rabies prevention(Tiwari et al., 2019). One possible explanation for this discrepancy could be the contextual differences between the study populations. In the Lappadata Health Center area, cultural norms and attitudes may not have been as influential due to other overriding factors, such as the availability of health services or the specific ways information about rabies is disseminated within the community.

The strong influence of knowledge on RTA management can be justified by the direct correlation between awareness and behavior. Individuals with a comprehensive understanding of rabies risks and the necessary post-exposure actions are more likely to seek timely medical intervention, which is critical given the fatal nature of rabies if left untreated. This is consistent with the Health Belief Model (HBM) discussed by Soetanto et al. (2021), which posits that perceived severity and self-efficacy are key drivers of health-related behaviors(Soetanto et al., 2021). In this context, knowledge enhances both perceived severity of rabies and confidence in the efficacy of medical treatments, leading to better management practices.

The non-significance of attitudes and cultural practices in this study may also reflect the limitations of the measurement tools used or the homogeneity of these variables within the study population. The high reliance on traditional treatments, such as herbal remedies or consultation with shamans, suggests that cultural practices might override individual attitudes, especially in areas where modern medical practices are less accessible or culturally accepted. This finding indicates that while knowledge is crucial, effective rabies control also requires culturally sensitive interventions that bridge traditional practices with evidence-based medical care.

The role of cross-sector collaboration in rabies management, although not statistically significant in this study, remains an important aspect of a comprehensive rabies control strategy. Previous research by Subrata et al. (2020) emphasized that coordination among stakeholders, including health, veterinary, and local government sectors, is crucial for effective rabies prevention and control(Subrata et al., n.d.). The non-significant findings in this study could be due to the short duration of the study or the level of implementation and effectiveness of such collaborations in the Lappadata Health Center area. Strengthening these partnerships, with a focus on consistent and coordinated efforts, could enhance the impact of rabies prevention programs.

This study boasts several strengths that significantly enhance the validity and impact of its findings. First, the study utilized a large and diverse sample size of 278 respondents, ensuring a good representation of the population within the Lappadata Health Center's working area. This diversity in the sample allows for a more comprehensive understanding of the factors influencing rabies-transmitting animal (RTA) bite management. The methodological rigor applied throughout the study further strengthens its reliability. Data collection was meticulously carried out using structured questionnaires administered by trained interviewers, minimizing the risk of bias and ensuring consistency in responses. The study also employed advanced analytical techniques, including both bivariate and multivariate analyses, to accurately identify and quantify the relationships between the key variables and RTA management. The use of logistic regression analysis provided a clear

understanding of the most significant predictors of effective RTA management, contributing to the robustness of the conclusions drawn. Despite its strengths, this study also has several limitations that should be acknowledged. One key limitation is the cross-sectional design, which restricts the ability to establish causality between the variables studied and RTA management outcomes. While the study provides valuable insights into associations, it cannot definitively determine the directionality of these relationships. Future research employing longitudinal designs could better capture the causal dynamics at play. Another limitation lies in the potential homogeneity of certain variables within the sample, particularly regarding attitudes and cultural practices. The non-significance of these variables in the multivariate analysis may reflect a lack of variation rather than an absence of influence, suggesting that the study may not have fully captured the nuances of these factors. Further studies with more diverse populations or qualitative approaches could help to explore these variables in greater depth. Lastly, the study's findings are context-specific to the Lappadata Health Center's area, which may limit to other regions with different cultural, social, and healthcare contexts.

CONCLUSION:

This study concludes that knowledge is the most significant factor in the effective management of rabies-transmitting animal (RTA) bite cases in the Lappadata Health Center area. While attitudes, cultural practices, and cross-sector collaboration also play roles, their impact is less pronounced. Enhancing community education and fostering collaborative efforts are crucial for improving rabies prevention and control. It is recommended that future interventions focus on targeted educational programs and strengthening cross-sectoral partnerships to achieve better health outcomes.

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AUTHORS' CONTRIBUTIONS

N was responsible for the study design, data collection, and data analysis, and also took the lead in writing the manuscript.

ILM contributed to the study design and provided critical review and revisions to the manuscript.

W was involved in the study design and played a key role in reviewing and refining the manuscript.

AZ contributed by providing thorough reviews and constructive feedback on the manuscript.

M assisted in data analysis and also contributed to the review process, ensuring the accuracy and integrity of the data presented.

I provided valuable insights during the review process, helping to refine and enhance the quality of the manuscript.

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