

COMMUNITY KNOWLEDGE ON THE PREVENTION AND EARLY HANDLING OF RABIES DOG BITES IN BANJAR UNTAL - UNTAL DALUNG

Gede Fransisco Antonio Protestanto¹, Wayan Citra Wulan Sucipta Putri²,
Dyah Pradnyaparamita Duarsa², Komang Ayu Kartika Sari²

¹Medicine and Doctor Profession, Medical Faculty of Udayana University, Denpasar, Bali

² Department of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University

Email: Fransiscoeyo98@gmail.com

Abstract: Rabies is an infectious disease affecting the central nervous system. It is caused by Rhabdovirus spread by the bites of rabies spreading animals such as dogs. In 2015, there were 80.403 cases of rabies-carrier animal bite, with the most cases were found in Bali for as much as 42.630 cases (53,0%). The main rabies-spreading animals were dogs (98%). Therefore, such study is done to measure the level of people's knowledge on the prevention and early management of rabies dog-bite in banjar Untal-untal, Dalung. This study is a cross-sectional descriptive study on the people of banjar Untal-untal Dalung who had any dog, selected with simple random sampling method, resulting in a total 65 respondent. Data aggregation was managed with the use of questionnaire. The level of knowledge was measured by Guttman Scale by scoring (1) and (0), until a total percentage was accumulated and was categorized into four: good (75%-100%), borderline (56%-75%), lack (40-55%) and bad (<40%). From a total of 65 study samples, it was concluded that the distribution of people's knowledge on the prevention and early management of rabies dog-bite in banjar Untal-untal Dalung was mostly in good levels (56 respondents, 86,1%). Meanwhile the remaining respondents were found to have borderline (5 respondents, 7,7%) as well as lack of knowledge (4 respondents, 6,2%). The result of this study was expected to be the foundation of further studies regarding the relationship of the level of people's knowledge with each suspected associated variables, such as demographic characteristics, as well as the implementation of the prevention acts.

Keywords: Rabies, Rabies Dog Bite, Knowledge Level, Prevention.

1. INTRODUCTION

Rabies is a disease known as mad dog disease, an infectious disease that can attack the human central nervous system. Rabies is caused by a virus, of the genus *Lyssavirus* in the family *Rhabdoviridae*. Rabies virus can be transmitted through the bite of Rabies Transmitting Animals (HPR) such as dogs, cats and monkeys. This disease can be transmitted through bites or scratches from animals that can transmit the rabies virus.¹ Rabies is one of the most feared diseases in the community, because it almost always ends in death or can be said to have a case fatality rate of reaching 100%.² Because this disease can end in death, many people are anxious and afraid of being bitten by a rabies-carrying animal (GHPR).

Rabies has been known by the public and rabies itself has spread very widely throughout the world, and more than 55,000 cases in humans have been reported every year in the world.³ The first occurrence of rabies in Indonesia was in 1884. For the first time, Schoorl found rabies on a horse, followed by Esser in 1889 on a buffalo, in Bekasi it was found in 1890 by

Penning on a dog in Tangerang. In 1990, Lier found 2 cases of rabies in cats in the Bondowoso area. The first human case of rabies was reported by Eilerts de Haan in a small child in Palimanan Village, Cirebon in 1894.⁴

Over time, rabies spread to various regions in Indonesia, namely West Sumatra, Central Java and East Java in 1953, South Sulawesi in 1959, Lampung in 1969, Aceh in 1970, Jambi and DI Yogyakarta in 1971. Rabies began to spread to Bengkulu, DKI Jakarta and Central Sulawesi, which was reported in 1972, in East Kalimantan in 1974 and Riau in 1975. In the 1990s and 2000s, rabies was increasingly spreading to areas free from rabies, ending with contracting the rabies virus. , namely Flores Island in 1998, Ambon Island and Seram Island in 2003, Halmahera and Morotai in 2005, Ketapang in 2005, and Buru Island in 2006. Bali Island was reported to have contracted rabies in 2008, Bengkalis Island and Rupa Island in Riau Province in 2009.⁵ In 2015, there were 80,403 cases of GHPR, with the most cases occurring in Bali, as many as 42,630 case. As for the death from rabies (Lyssa) there were 118 cases, the most occurred in North Sulawesi as many as 28 cases and in Bali as many as 15 cases, with the main animals that transmit rabies in Indonesia are dogs (98%) and cats and monkeys (2%).⁶

One of the most important efforts to control rabies is proper management of GHPR cases. In wound care, primary care plays an important role as the first line, where general practitioners play a role in providing appropriate treatment according to the protocol/algorithm so as to prevent or reduce the risk of rabies in humans. However, based on Pusdatin 2016, the role of the community is no less important as a determining factor for the high and low cases of rabies in animals and humans in an area, especially in terms of public awareness and knowledge about the dangers of rabies as well as appropriate prevention and first aid measures for individuals suspected of having rabies. exposed to the rabies virus.⁶

Current data in Indonesia is still lacking. However, some comparative data from India looks worrisome. In one study it was found that although more than 99% of respondents knew about rabies and the risk of rabies from HPR bites, only 31.1% would seek early treatment if bitten and only 36.4% would take the bite victim to a primary health facility.⁷ Meanwhile, Siburian (2018) in his research in Sitinjo Village, Medan found that 65% of respondents had good enough knowledge.⁸ A fairly high number was also found in several other studies regarding public knowledge of rabies and its prevention, which included 71.4% good knowledge by Wagiu in Minahasa,⁹ and 78.10% highly knowledgeable by Sarjana in the Kuta II Health Center area.¹⁰ However, since 2015, cases of rabies in animals and humans have increased again, with one of the causes of The increase is the increase in rabies cases in Bali Province.⁶

With the re-emergence of rabies cases in Bali, and considering the danger to the health and survival of the community, it is important to carry out intensive and comprehensive efforts to prevent and eradicate the disease, including the community as the frontline of efforts to prevent rabies. Therefore, this study was conducted to describe the knowledge of the people of Banjar Untal-Untal Dalung on prevention and early treatment of rabid dog bites.

2. MATERIALS AND METHODS

This study is designed to be a descriptive study with cross sectional method. The research data collection was carried out in Banjar Untal-Untal, Dalung in March 2021. The target population in this study was the Dalung community who had dogs. The affordable population in this study was the people of Banjar Untal-Untal Dalung who had dogs. The sample population will fulfill the inclusion and exclusion criteria. The inclusion criteria were the Untal-Untal Dalung community who were willing to be research subjects, the Untal-Untal Dalung community who had dogs, who were at least 18 years old. The exclusion criteria was that the Untal-Untal Dalung community owned dogs, who were not willing to be the subject of the study. The sampling technique of this research used consecutive sampling method. Descriptive formula is used to obtain sample size.¹¹ The sample size of this study will be 62. The variable in this study was knowledge about prevention & early treatment of rabid dog bites (GAR). Data collected from the questionnaire will be statistically analyzed using SPSS.

3. RESULTS

After data collection from all research samples has been completed, data processing is carried out. Of the 70 selected samples, 65 samples were successfully collected and their willingness to participate in the study was asked. While the other 5 were dropped out on the grounds that the questionnaire was incomplete. Table 1 is the frequency distribution of the study sample based on its demographic characteristics.

Table 1. Distribution of study sample frequencies based on demographic characteristics (N=65, 100%)

Characteristic	n	%
Age		
< 50 years	41	63,1
> 50 years	24	36,9
Education		
< elementary school	1	1,5
Elementary school	7	10,8
middle school	14	21,5
high school	27	41,6
> high school	16	24,6
Profession		
Government employees	5	7,7
Private employees	15	23,1
entrepreneur	14	21,5
Does not work	10	15,4
College student	21	32,3

From Table 1, it can be seen that the distribution of the people of Banjar Untal-Untal Dalung who was the sample of the research on the level of community knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-Untal Dalung, the majority were aged less than 50 years, as many as 41 respondents (63,1%). While the last education of the respondents was more dominant at the high school level, namely 27 respondents (41.6%) and the majority were students, namely 21 respondents (32.3%). In addition, the majority of the Badung community have one to two dogs (44 respondents, 67.7%).

Public Knowledge of Prevention and Early Handling of Rabies Dog Bites in Banjar Untal-Untal Dalung

The determination of the knowledge level score is carried out in the manner described in Chapter IV, namely by calculating the percentage of scores achieved per maximum score, so that the category of public knowledge on preventing rabies dog bites in Banjar Untal-untal Dalung can be determined which includes:

1. Good Knowledge = 76%-100%
2. Enough Knowledge = 56%-75%
3. Less Good Knowledge = 40%-55%
4. Poor Knowledge = <40%

The data on the level of knowledge of the research sample are presented in Table 2, while the details of the frequency distribution of respondents' answers for each item of the knowledge level questionnaire are described in more detail in Table 3.

Table 2. Frequency distribution of public knowledge on prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung (N=65, 100%)

No.	Knowledge	Amount	
		n	%
1	Good	56	86,1
2	Enough	5	7,7
3	Less good	4	6,2
4	Poor	0	0,0
TOTAL		65	100,0

From Table 2, it can be seen that the distribution of public knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung, includes good knowledge of 56 (86.1 %), respondents with good knowledge of 5 (7.7 %), and respondents with less good knowledge as many as 4 (6.2%). Based on the total score of the questionnaires collected, there were no respondents with poor knowledge levels.

Table 3. Distribution of answers to the public knowledge questionnaire on prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung (N=65, 100%)

Knowledge statement	Answer (%)			
	Wrong		Right	
	n	%	n	%
Knowledge of Rabies				
<input type="checkbox"/> Symptoms of a rabid dog	4	6,2	61	93,8
<input type="checkbox"/> Transmission of the rabies virus to humans	11	16,9	54	83,1
<input type="checkbox"/> Symptoms in humans infected with the rabies virus	47	72,3	18	27,7
Knowledge on Prevention of Rabies Dog Bites				
<input type="checkbox"/> Rabies vaccine is important for dogs	2	3,1	63	96,9
<input type="checkbox"/> Rabies vaccine can be found at the nearest health service	6	9,2	59	90,8
<input type="checkbox"/> Dogs may be allowed to roam out of control.	46	70,8	19	29,2
<input type="checkbox"/> Bringing dogs from one area to another is allowed.	41	63,1	24	36,9
Knowledge of the Early Management of Rabies				
<input type="checkbox"/> Initial treatment of victims bitten by a rabid dog (GAR)	16	24,6	49	75,4
<input type="checkbox"/> Follow-up treatment of GAR by medical personnel	9	13,8	56	86,2
<input type="checkbox"/> Dogs infected with the rabies virus should be treated	10	15,4	55	84,6

From Table 3, it can be seen that most of the respondents answered correctly on most of the questions on the knowledge level questionnaire. However, in the 3 statement items, which include statement items numbered 3, 6, and 7, most of the respondents, which is more than 60%, gave wrong answers,

Public Knowledge of Prevention and Early Management of Rabies Dog Bites in Banjar Untal-Untal Dalung Based on Demographic Characteristics

The distribution of the level of public knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung according to each demographic characteristic is shown in table 4 below.

Table 4. Distribution of public knowledge on prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung based on demographic characteristics (N=65, 100%)

Characteristic	Knowledge						Total	
	Good		Enough		Less		N	%
	n	%	n	%	n	%		
Age								
≤ 50 years	37	90,3	4	9,7	0	0,0	41	100
> 50 years	19	79,2	1	4,2	4	16,6	24	100
Education								
Low	13	59,1	5	22,7	4	18,2	22	100
High	43	100	0	0,0	0	0,0	43	100
Profession								
Work	31	91,2	2	5,9	1	2,9	34	100
Does not work	3	30	3	30	4	40	10	100
College students	21	100	0	0,0	0	0,0	21	100

From Table 4 it can be observed that the distribution of public knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung, most of them are in the age group less than 50 years, namely 41 respondents (63.1%) of the total sample, with good knowledge as many as 37 respondents (90.3%), and enough knowledge as many as 4 respondents (9.7%), and minorities are in the age group more than 50 years, namely as many as 24 respondents (36.9%), with good knowledge as many as 19 respondents (79.2%), 1 respondent with enough knowledge (4.2%), and less knowledgeable as many as 4 respondents (16.6%).

Meanwhile, for the last education level, higher education level (\geq SMA) made up the majority of respondents, namely 43 respondents (66.2%) of the total sample, with all respondents having good knowledge (100%), and the minority being in the group with low education level (\leq . SMP) as many as 22 respondents (33.8%) with the majority having good knowledge of 13 respondents (59.1%). Furthermore, the majority of the research sample was in the working group, namely 34 respondents (52.3%) with most of them having good knowledge, namely 31 respondents (91.2%), and the minority being in the unemployed group, namely 10 respondents (15.4. %) with the majority having less knowledge, namely 4 respondents (40%).

4. DISCUSSION

Based on the results of measuring the level of public knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung, the discussion of each aspect related to this knowledge is as follows:

Public Knowledge of Prevention and Early Handling of Rabies Dog Bites in Banjar Untal-Untal Dalung

Based on the research results listed in Table 2, the level of public knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung is at a good level. This can be seen in the greater frequency of respondents who scored between 76%-100% who were included in the good knowledge category, namely 56 respondents (86.1%). While the rest occupied the category of enough and less level of knowledge, namely 5 respondents (7.7%) and 4 respondents (6.2%), while there were no respondents with poor knowledge levels.

This is in line with previous research by Siburian in Sijinjo Village, Medan, where it was found that 65% of respondents had enough knowledge.⁸ A fairly high level of knowledge was also found in several other studies regarding public knowledge of rabies and its prevention, which include 71.4% have good knowledge by Wagiu in Minahasa,⁹ and 78.10% have high knowledge by Sarjana in Kuta II Health Center Area.¹⁰

When examined further, as can be seen from Table 3, of the fourteen items divided into three categories in this knowledge level questionnaire (knowledge of rabies, knowledge of prevention of rabid dog bites, knowledge of initial handling of rabies), the majority of respondents gave correct answers to the seven statements. The seven statements include symptoms in dogs that are infected with the rabies virus, the ability of the rabies virus to transmit to humans, the importance of rabies vaccine for dogs, the availability of rabies vaccine at the nearest health service, initial and follow-up treatment for victims who are bitten by rabid dogs, actions that need to be taken in dogs infected with the rabies virus.

However, for the remaining three items, the majority of respondents gave wrong answers. The first item in question is in the category of knowledge on rabies number 3 which states the symptoms that can be caused by the rabies virus in infected humans include fever, weakness, tingling, headache, and feeling anxious. This statement should be true. However, as many as 47 respondents (72.3%) even thought it was wrong and only 18 respondents (27.7%) answered correctly.

This finding is somewhat different when compared to previous studies in India. In one study it was found that although more than 99% of respondents knew about rabies and the risk of rabies from HPR bites, only 31.1% understood and would seek early treatment if bitten and only 36.4% would take the bite victim to a primary health facility.⁷ Meanwhile, referring to the definition of rabies according to Singh which is a zoonotic infectious disease caused by the rabies virus which is neurotropic in nature, which means it has a tendency to infect tissues in the central nervous system (CNS) which can cause infection. fatal for the survival of the infected host.¹

Tanzil in his journal added that the prodromal symptoms of rabies are usually non-specific characterized by fever, headache, malaise, myalgia, respiratory symptoms, and gastrointestinal symptoms, plus symptoms suggestive of rabies in the form of paresthesias (tingling), pain, itching, and/or fasciculations at or around the site of virus inoculation which then extends to other areas of the extremity.² After prodromal symptoms, the clinical picture of rabies will develop into one of two forms of advanced symptoms, namely encephalitis (furious) or paralytic (dumb). The encephalitic form is characterized by excessive motor activity, excitation, agitation, confusion, hallucinations, muscular spasm, meningismus, epistotonic posture, convulsions and focal paralysis may occur. Pathognomonic symptoms include hydrophobia and aerophobia. On physical examination, the temperature can reach 39°C. Abnormalities in the autonomic nervous system include irregularly dilated pupils, increased lacrimation, salivation, sweating, and postural hypotension, which then develop further into manifestations of brainstem dysfunction (Tanzil, 2014).²

The next statement item that needs more attention is in the second part of the questionnaire regarding knowledge on preventing rabid dog bites, number 6 which states that dogs can be left to roam outside of control, which should be judged wrong. However, as many as 46 respondents (70.8%) even considered it correct and only 19 respondents (29.2%) with the correct answer. In addition, it is also related to statement number 6, number 7 which states that it is permissible to bring dogs from one area to another, which should be considered wrong. However, as many as 41 respondents (63.1%) even considered it correct and 24 respondents (36.9%) with the correct answer.

Based on Kemenkes RI 2016 and Siburian, there are several preventive steps that can be taken related to efforts to control and eradicate rabies cases, which include primary, secondary and tertiary prevention.^{6,8} Primary prevention includes not giving permission to enter/unload dogs, cats, and other rabies-carrying animals in rabies-free areas, and destroying dogs from trespassing into rabies-free areas. Meanwhile, the secondary prevention of rabies is in the form of initial treatment and cases of rabid dog bites. Pusdatin (2016) adds that the level of rabies cases in an area is determined by several factors, one of which is public awareness in the proper animal care procedures. carry out routine vaccinations and do not allow pets (dogs) to roam unsupervised, and do not travel with pets from one area to another.⁶

Public knowledge that is relatively good about preventing rabid dog bites in the Banjar Untal-untal Dalung is thought to be based on the respondent's understanding that bites of any animal, especially dogs, both domesticated and stray dogs, are considered alarming and even dangerous, so with full awareness they also immediately brought the case to the hospital. nearest health service unit for further treatment. Meanwhile, for a more specific discussion according to each statement item with the majority of respondents giving incorrect answers, this may be due to the lack of education of medical personnel, especially doctors, regarding the importance of understanding the symptoms in humans who are infected with the rabies virus. The majority of respondents think that humans who are infected with rabies, also known as "mad dog" will only give symptoms of pain in the bite wound and excessive anxiety like "crazy". Though the manifestation of this disease is more complex than just the symptoms.

Furthermore, this is also related to the prevention of rabid dog bites. Education regarding prevention, both primary, secondary and tertiary, is also thought to be lacking. Most of the respondents thought that as long as their pets (especially dogs) looked healthy and without significant complaints, dogs were allowed to be released outside the control of their owners, including taking them outside their residential areas, which clearly contradicts the recommendations of Kemenkes RI 2016 regarding preventive measures related to control. and eradication of rabies cases in an area.⁶

Therefore, counseling to the general public, especially pet owners, needs to be further improved by health workers to control infectious diseases. Things that need to be educated both to the general public, especially dog owners, include understanding the disease of rabies, modes of transmission, and symptoms in humans who are infected with the rabies virus, initial and follow-up treatment for victims of rabid dog bites (GAR), as well as steps that can be taken to prevent rabies from occurring. carried out regarding the prevention of GAR.

Public Knowledge of Prevention and Early Management of Rabies Dog Bites by Age

Based on the research results listed in Table 4, the level of public knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung appears to have relatively the same proportions, which is more distributed at the level of good knowledge, both in the age group less than 50 years (37 respondents, 90.3%) as well as the age group over 50 years (19 respondents, 79.2%). This is not in accordance with the opinion of Notoatmodjo who in his study said that relatively young people have less knowledge when compared to older age groups.

However, this is thought to be influenced by the rapidly developing technology nowadays which makes it easier for everyone of all ages to access any information on the internet, without exception regarding medical information. This is also supported by a systematic review by Chaudhry et al.,¹⁴ who explained that technology as a means of providing health information plays a role in increasing individual knowledge, through understanding the standard guidelines for each disease, which in turn has an impact on increasing awareness of the importance of disease surveillance, in order to improve health quality in the end.

Public Knowledge of Prevention and Early Management of Rabies Dog Bites in Banjar Untal-untal Dalung Based on Last Education Level

Based on the research results listed in Table 4, the level of public knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung was found to be relatively in the good category for each level of higher education. It can be observed by the majority in the group with the last education high school with all respondents having good knowledge as many as 43 respondents (100%).

This is supported by the statement of Notoadmodjo in his study that education plays an important role at the level of individual analysis and understanding of a newly accepted science, so that the implementation ability will be better.¹² The level of knowledge which is directly proportional to the level of education is thought to be influenced by the increasing the opening of opportunities for individuals to obtain information in various fields and the higher the ability of each individual in digesting the information received into an understanding so that it is expected to be applied well in every aspect of his life. Conversely, low levels of education can have an impact on the less information that will be received. Meanwhile, the low level of knowledge in the last education category is more than high school when compared to the group with the last high school education, it is thought to be influenced by the difference in the sample obtained less in the last high school education group.

Public Knowledge of Prevention and Early Handling of Rabies Dog Bites in Banjar Untal-untal Dalung Based on Occupation

Based on the research results listed in Table 4, the level of community knowledge on the prevention and early treatment of rabid dog bites in Banjar Untal-untal Dalung was found to be in a good category for the group of respondents with working status which is the majority group in the study sample (34 respondents, 52,3 %), which most of the respondents were found to have good knowledge (31 respondents, 91.2%). However, the majority of respondents in the unemployed group were found to have less knowledge, namely 4 respondents (40%) out of a total of 10 respondents in this group.

When referring to the definition of work based on Notoadmodjo which is an individual activity in earning income to meet the needs of life, the possible explanation regarding the difference in the level of knowledge between groups of workers and non-workers is thought to be influenced by individual efforts to earn income which allows the wider scope of the community. the individual concerned. The wider the community, the greater the opportunity for these individuals to exchange information with one another, so that it will affect the increase in the individual's level of knowledge. On the other hand, someone who does not work is expected to have limited interaction with only family and closest people, making it difficult to develop which will ultimately lead to a low level of knowledge of the individual concerned.¹³

Research Limitations

The limitation of this research on the level of public knowledge on the prevention of rabid dog bites in Banjar Untal-untal Dalung is the non-randomized/non-probability sampling technique, which does not allow every research subject to get the same opportunity. In addition, this study did not analyze the relationship between the level of public knowledge and the prevention of rabies in the Banjar Untal-untal Dalung area. Therefore, further studies on the analysis of this relationship are needed. So that optimal control and eradication efforts can be carried out against rabies.

5. CONCLUSION

Based on the research that has been done, it can be concluded that the distribution of public knowledge on the prevention and early treatment of rabid dog bites (GAR) in Banjar Untal-untal Dalung is mostly well-informed, as many as 56 respondents (86.1%), while the remaining respondents were found to be quite knowledgeable. as many as 5 respondents (7.7%) and less knowledgeable as many as 4 respondents (6.2%). The level of community knowledge regarding the prevention and early treatment of GAR, especially assessed as lacking in the knowledge level questionnaire item number 3, 6, and 7, most of the respondents, which is more than 60% on average, gave wrong answers.

6. RECOMMENDATION

Based on the results of research and discussions that have been supported by the opinions of experts from previous studies, some suggestions that can be given for further development of this research include:

1. Improved Communication, Information, and Education (KIE) by medical personnel (both doctors, and other health workers) in terms of understanding about rabies in general, initial treatment for victims who are bitten by rabid dogs, and steps to prevent dog bites rabies.
2. Further research is conducted on the relationship between the level of public knowledge on the prevention and early treatment of rabid dog bites, with factors that in this study are thought to influence it, such as demographic characteristics (age, education, occupation).
3. Further research is conducted on the relationship between the level of public knowledge on the prevention and early treatment of rabid dog bites and the implementation of the rabid dog bite prevention measures.

REFERENCES

- [1] Singh R, Singh KP, Cherian S, Saminathan M, Kapoor S, Manjunatha Reddy GB, Panda S, Dhama K. Rabies–epidemiology, pathogenesis, public health concerns and advances in diagnosis and control: a comprehensive review. *Veterinary Quarterly*. 2017 Jan 1;37(1):212-51.
- [2] Tanzil K. Penyakit rabies dan penatalaksanaannya. *E-Journal WIDYA Kesehatan Dan Lingkungan*. 2014 May 23;1(1).
- [3] Burgos-Cáceres S. Canine rabies: a looming threat to public health. *Animals*. 2011 Dec;1(4):326-42.
- [4] Susetya H, Sugiyama M, Inagaki A, Ito N, Mudiarto G, Minamoto N. Molecular epidemiology of rabies in Indonesia. *Virus research*. 2008 Jul 1;135(1):144-9.
- [5] Budiharta S. *Epidemiologi zoonosis di Indonesia*. Widiasih DA, editor. Gadjah Mada University Press; 2012.
- [6] Kemenkes. (2016). *Infodatin 2016 : Jangan Ada Lagi Kematian Akibat Rabies*.
- [7] Singh US, Choudhary SK. Knowledge, attitude, behavior and practice study on dog-bites and its management in the context of prevention of rabies in a rural community of Gujarat. *Indian Journal of Community Medicine*. 2005 Jul 1;30(3):81.
- [8] Siburian L. *Gambaran Pengetahuan dan Sikap Masyarakat Terhadap Pencegahan Rabies di Desa Sitinjo Kecamatan Sitinjo Kabupaten Dairi*. 2019
- [9] Wagiu RB, Rombot DV, Sapulete M. Perilaku Masyarakat terhadap Pencegahan Penyakit Rabies di Desa Pahaleten Kecamatan Kakas Kabupaten Minahasa. *JURNAL KEDOKTERAN KOMUNITAS DAN TROPIK*. 2013;1(1).
- [10] Sarjana NK, Prasetyawati AE, Budiani DR. Hubungan antara Tingkat Pengetahuan dan Sikap dengan Tindakan Pencegahan Penyakit Rabies pada Warga di Wilayah Puskesmas Kuta II. *Smart Medical Journal*. 2018 Sep 18;1(1):18-25.
- [11] Shah SF, Jawed M, Nooruddin S, Afzal S, Sajid F, Majeed S, Naveed M, Mustafa K, Azhar M. Knowledge and practices among the general practitioners of Karachi regarding dog bite management. *JPMA. The Journal of the Pakistan Medical Association*. 2009 Dec 1;59(12):861-4.
- [12] Notoatmodjo, S (2003). *Pendidikan dan Perilaku Kesehatan*. Jakarta: PT. Rineka Cipta.
- [13] Notoadmodjo, S. (2007). *Metode penelitian Kesehatan*. Jakarta, Rineka Cipta
- [14] Chaudhry B, Wang J, Wu S, Maglione M, Mojica W, Roth E, Morton SC, Shekelle PG. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. *Annals of internal medicine*. 2006 May 16;144(10):742-52.