Knowledge, Attitude and Practices Toward Zoonotic Diseases

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ABSTRACT

The important aspects of Knowledge, Attitude, and Practices (KAP) regarding zoonotic diseases are examined in this chapter, with a focus on how these factors affect public health, the global economy, and overall well-being. Zoonotic diseases that may spread from animals to people have drawn more attention because of their propensity to cause pandemics and epidemics. In tackling zoonotic issues, the chapter explores the notion of One Health, recognizing the interdependence of environmental, animal, and human health. It emphasizes how important it is to evaluate KAP to conduct efficient risk assessments, preventative measures, and behavior modification. The routes of transmission are explained, including vector-borne, foodborne, airborne, waterborne, direct and indirect contact, and fomite transmission. The discourse encompasses the function of public awareness and education initiatives, customized interventions, and the involvement of healthcare practitioners in the dissemination of information. The chapter highlights the significance of evidence-based policies and interventions, outlines obstacles to enhancing KAP, and suggests future study topics. Overall, for efficient prevention, control, and global health security, a thorough understanding of KAP to zoonotic illnesses is crucial.

Key words: Zoonotic Diseases, Knowledge, Attitude, and Practices (KAP), One Health, Transmission Routes, Global Health Security

CITATION

Khanum S, Asad M, Ali K, Baber ZU, Riaz A, Rasheed M, Fatima T, Arif A, Waheed T and Saleem M, 2023. Knowledge, attitude and practices toward zoonotic diseases. In: Khan A, Rasheed M and Abbas RZ (eds), Zoonosis, Unique Scientific Publishers, Faisalabad, Pakistan, Vol. I: 486-498. https://doi.org/10.47278/book.zoon/2023.037

CHAPTER HISTORY Received: 05-May-2023 Revised: 20-June-2023 Accepted: 14-Aug-2023

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1. INTRODUCTION

Infectious illnesses, known as zoonotic diseases, can spread from animals to people. These illnesses have gotten a lot of attention recently because of their propensity to start outbreaks and pandemics, as well as their impact on the economy and global health. Zoonotic diseases are transmissible through a number of routes, including direct contact with infected animals, consumption of contaminated food or water, and vectors like mosquitoes and ticks. Bacteria, viruses, parasites, and fungi cause zoonotic diseases (Rahman et al. 2020). Zoonotic diseases are conditions that can be transmitted between humans and animals. When such diseases are spread from animals to humans, they are referred to as zoonosis. To establish effective strategies for preventing, controlling, and treating zoonotic diseases, it is important to understand the intricate relationships between humans, animals, and the environment. Zoonotic illnesses, which can be seriously ill and kill both people and animals, have been the root of many epidemics. A number of factors, such as changes in land use, urbanization, climate change, and international trade, influence the development and spread of zoonotic diseases (Peterson and Barnes 2020).

One Health concept has gained significance in tackling zoonotic diseases, by acknowledging the link between human, animal, and environmental health. This approach emphasizes the need for collaboration and coordination among various disciplines, such as human and veterinary medicine, public health, and environmental science. By working together, these fields can address the multifaceted challenges posed by zoonotic diseases (Meurens et al. 2021). Zoonotic illnesses are a significant global problem due to their capacity to start epidemics, impact on human and animal health, and economic implications. Protecting the public's health and the welfare of both humans and animals depends on an understanding of the dynamics of zoonotic diseases and the implementation of suitable prevention and control measures. (Gubler et al. 2002).

2. SIGNIFICANCE OF UNDERSTANDING KNOWLEDGE, ATTITUDES, AND PRACTICES

2.1. ASSESSMENT OF RISK AND PREVENTION

Previous research and data on zoonotic diseases allow researchers to identify knowledge gaps and misconceptions that could increase the risk of transmission. Understanding how individuals think and behave in relation to zoonotic diseases can help create specific interventions and educational initiatives that promote risk-reduction practices and preventive measures (Alemayehu et al. 2021).

3. BEHAVIOR CHANGE AND PUBLIC HEALTH EDUCATION

The way that knowledge and attitudes influence behavior is crucial. People are more likely to adopt preventative measures and engage in behaviors that lower the risk of transmission when they are well-informed about zoonotic illnesses and have accurate knowledge. Misconceptions can be found and dispelled through education, which can encourage behavior change and improve health outcomes. A successful strategy for addressing zoonotic illnesses requires a multidisciplinary approach that involves cooperation between the veterinary, environmental, and human health sectors. To develop policies that effectively tackle the complex interactions between animals, humans, and the environment, it is crucial to gain an understanding of the Knowledge, Attitudes, and Practices of diverse stakeholders, including livestock producers, wildlife dealers, pet owners, and communities. One Health is an approach that acknowledges how linked these areas are and the need for concerted efforts to address them as shown in Fig. 1 (Li et al. 2021).

4. TAILORED INTERVENTIONS

The specific knowledge gaps, attitudes, and practices that must be addressed in various populations or communities are revealed by KAP (knowledge gaps, attitudes, and practices) research in a helpful way. This data enables the creation of customized interventions that are relevant to the target audience's culture and resonate with them. Interventions can be more effective in encouraging behavior change and lowering the risk of zoonotic disease transmission by addressing the unique barriers and difficulties discovered by KAP studies (Bardosh et al. 2014).

5. TRANSMISSION PATHWAYS AND FACTORS INFLUENCING TRANSMISSION

5.1. DIRECT CONTACT

Zoonotic illnesses can be spread by coming into close contact with animals that have the illness. This includes close physical contact, such as handling, stroking, or being bitten or scratched by an infected animal, as well as contact with bodily fluids, including saliva, blood, urine, or feces.

5.2. INDIRECT CONTACT

Indirect contact with contaminated settings or items can potentially spread zoonotic diseases. For instance, disease transmission can occur when people come into contact with surfaces or things that have been exposed to animal excrement or respiratory secretions.

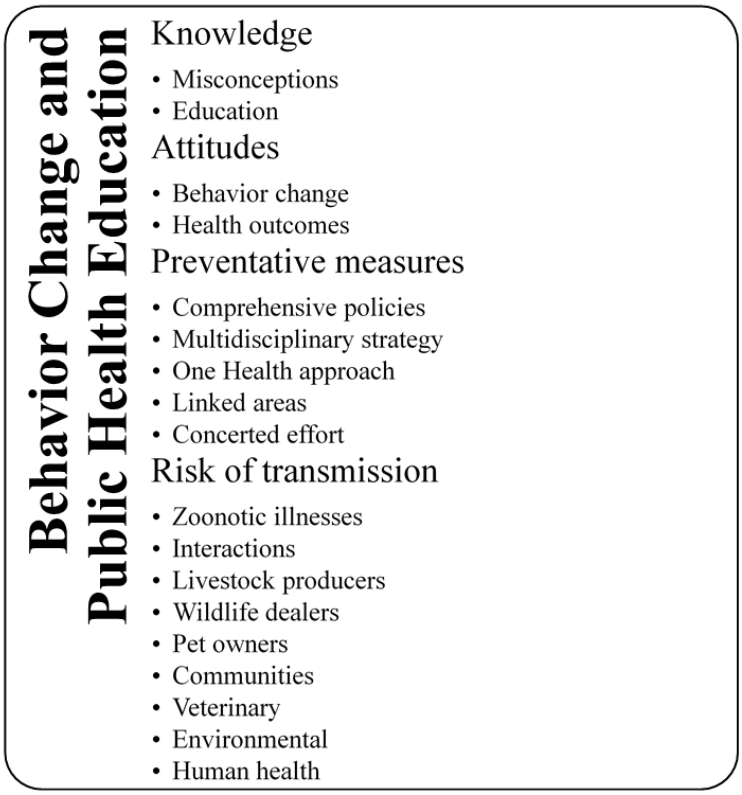


Fig. 1: Behavior Change and Public Health Education

5.3. VECTOR-BORNE TRANSMISSION

The bites of vectors like fleas, ticks, mosquitoes, or flies spread some zoonotic diseases. These vectors can pick up the infections from sick animals and then pass them on to people when they bite them again.

5.4. FOODBORNE TRANSMISSION

Through the intake of tainted food or water, it can spread zoonotic diseases. Consuming pathogen-contaminated, undercooked or raw animal products, such as meat, eggs, or milk, might get you sick.

5.5. AIRBORNE TRANSMISSION

It is possible for some zoonotic diseases to spread through the air, especially through respiratory droplets. Humans can catch an infection from respiratory droplets released by infected animals when they cough, sneeze, or breathe.

5.6. WATERBORNE TRANSMISSION

Water sources that are contaminated can act as a conduit for the spread of zoonotic illnesses. Infection can result from drinking or coming into touch with water that has been polluted with germs or animal waste. There are number of factors responsible for the development of zoonotic diseases and transmission to humans as shown in Fig. 2.

5.7. FOMITE TRANSMISSION

Fomites, which are inanimate items or surfaces that can harbor infections, can also spread zoonotic illnesses. Transmission can happen if someone touches contaminated objects, such as tools, clothing, or utensils, and then touches their face or lips. For effective preventive measures to be put in place, it is essential to comprehend these transmission channels. It is possible to create effective interventions to break the chain of transmission and lower the risk of zoonotic disease outbreaks by identifying the precise routes of transmission (Loh et al. 2015).

6. PUBLIC AWARENESS AND EDUCATION PROGRAMS

Programs for public awareness and education are essential for avoiding and managing zoonotic illnesses. These initiatives seek to inform both the public and specialized groups like butchers, livestock owners, and personnel at animal shelters about the dangers posed by zoonotic illnesses and the best ways to stop their spread. Numerous studies have emphasized the significance of these initiatives and demonstrated how they affect behavior modification and awareness-raising. For instance, a study on butcher’s knowledge of zoonotic illnesses was carried out in Proddatur city, Kadapa District, Andhra Pradesh, India. The study placed a strong emphasis on education initiatives' contribution to butchers' increased awareness and understanding. These initiatives can aid in better disease control and prevention. Another study looked at how public education affected rabies, a zoonotic illness that can be prevented (Hasanov et al. 2018). The study emphasized that successful control programs for infectious diseases like rabies depend on widespread public awareness campaigns and educational initiatives.

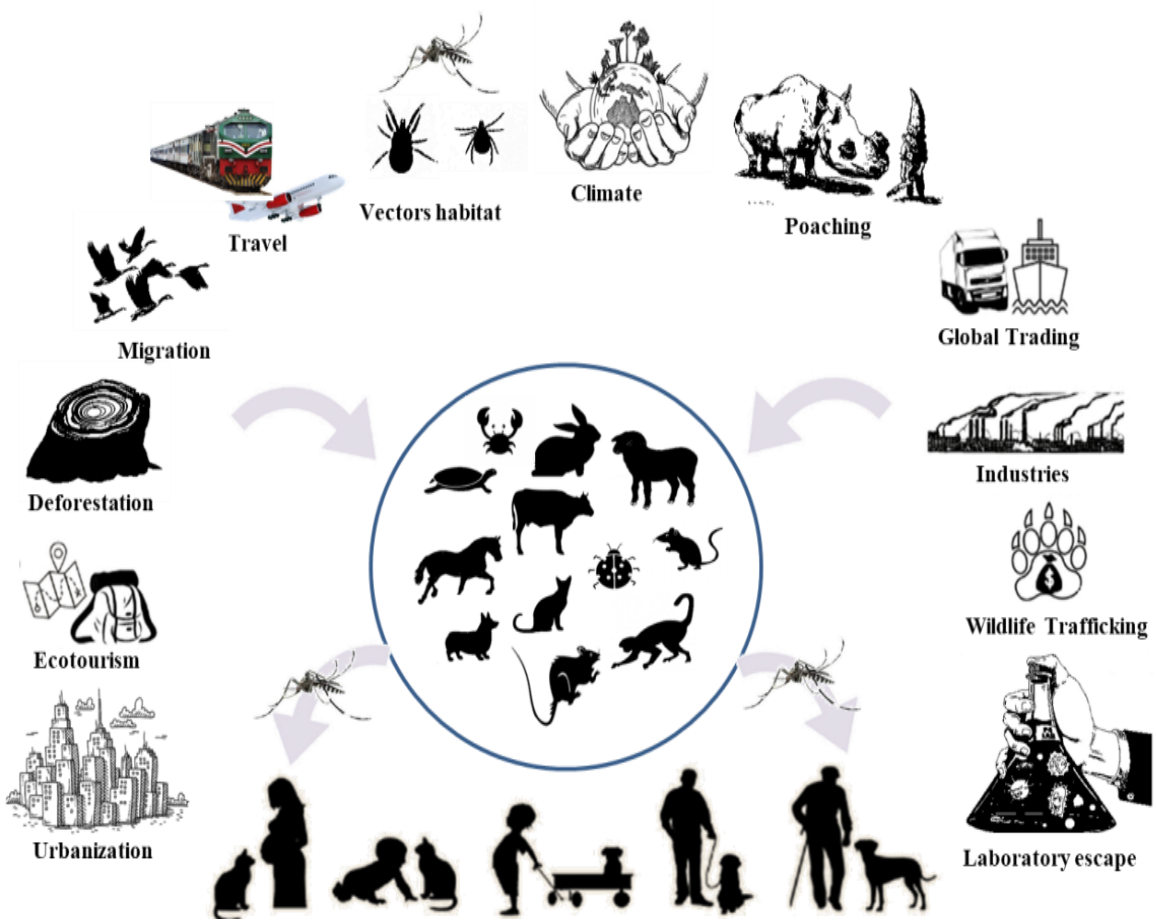


Fig. 2: Factors responsible for the development of zoonotic diseases and transmission to humans (do Vale et al. 2021)

Similar to this, One Health approach was used in Algeria to combat diseases spread by dogs, emphasizing the value of interdisciplinary training and education initiatives to increase public awareness (Kardjadj et al. 2019). These initiatives can increase the effectiveness of control measures and improve both human and animal welfare overall (Hasanov et al. 2018).

It's also vital to remember that programs for education and awareness are not just for the general population. They also target particular populations, like butchers, workers in animal shelters, and owners of livestock. These initiatives seek to educate and train people who interact often with animals and are more likely to spread zoonotic diseases (Steneroden et al. 2011). Public awareness and education campaigns are essential for stopping the spread of zoonotic illnesses. It has been demonstrated that these programs benefit both the general population and particular groups at higher risk by raising awareness, improving attitudes, and promoting behavior change as shown in Fig. 3. These programs provide a healthier and safer environment for both people and animals by spreading knowledge, encouraging ethical behavior, and One Health perspective (Prabhakar et al. 2017).

7. ROLE OF HEALTHCARE PROFESSIONALS IN DISSEMINATING KNOWLEDGE

Healthcare personnel are necessary in spreading information regarding zoonotic illnesses, as well as their attitudes, knowledge, and preventive practices. They are crucial information and direction sources

for the public, patients, and other healthcare professionals. Healthcare workers' knowledge, attitudes, and preventive practices surrounding COVID-19 were reviewed in a study carried out in Northern Nigeria, underscoring the significance of healthcare professionals in spreading information about zoonotic illnesses. In addition to highlighting the need for ongoing information distribution on zoonotic disease prevention, the study also found knowledge gaps about the zoonotic origin of diseases. Socio-demographic and occupational factors may influence the knowledge and practices of healthcare workers about zoonotic infections (Tsiga-Ahmed et al. 2021). Healthcare practitioners can disseminate accurate information to help promote preventative actions and raise knowledge of zoonotic illnesses, thereby lowering their negative effects on public health (Stull et al. 2015).

8. ATTITUDES TOWARDS ZOONOTIC DISEASES

8.1. PERCEIVED SUSCEPTIBILITY AND SEVERITY

Perceived susceptibility and severity significantly shaped attitudes toward zoonotic illnesses. Studies have used the Health Belief Model to examine how attitudes and risk perceptions toward zoonotic illnesses are affected by perceived susceptibility and severity (Anderson et al. 2010). A person's perception of their susceptibility to an illness is known as perceived susceptibility, while their perception of the seriousness of the sickness is known as perceived severity (Sukeri et al. 2020). According to research, wildlife biologist's perceptions of protective measure's potential advantages can influence their views towards the risk of zoonotic diseases. (Anderson Bosch et al. 2010). Increasing knowledge and awareness of the zoonotic disease's perceived severity and susceptibility can have an impact on attitudes and encourage preventive behavior (Sukeri et al. 2020).

8.2. ATTITUDES TOWARDS PREVENTIVE MEASURES

Regarding zoonotic diseases, attitudes towards preventive practices such as immunizations, good cleanliness, and animal handling have been studied. Studies have emphasized the significance of people's knowledge, attitudes, and behaviors in avoiding the spread of zoonotic illnesses (Alemayehu et al. 2021). Farmer's adoption of preventive measures was found to be influenced by their knowledge, attitudes, and practices related to zoonotic diseases. Examining cattle producer's knowledge of and attitudes toward zoonotic disease prevention, with a focus on the importance of education and awareness of preventive measures (Tebug et al. 2015). Smallholder communities in Ethiopia demonstrated low levels of understanding and attitudes toward the hazards of zoonotic diseases, highlighting the need for increased education and preventive measures (Delelegn and Girma 2018). Tanzanian animal health professionals and livestock owners were evaluated for their knowledge of and attitudes towards zoonosis, which highlighted the significance of comprehending zoonotic disease indicators and preventative measures (Swai et al. 2010). These studies underline how important it is to spread awareness, a healthy outlook, and preventive behaviors in order to effectively reduce zoonotic infections.

8.3. PRACTICES RELATED TO ZOONOTIC DISEASES

The transmission of zoonotic diseases must be controlled in order to lessen its effects on both human and animal populations. It's crucial to uphold proper standards for sanitation and hygiene, including proper hand washing, waste disposal, and cleanliness in facilities used for housing and handling animals. Another essential practice for reducing zoonotic illnesses is routine veterinary treatment,

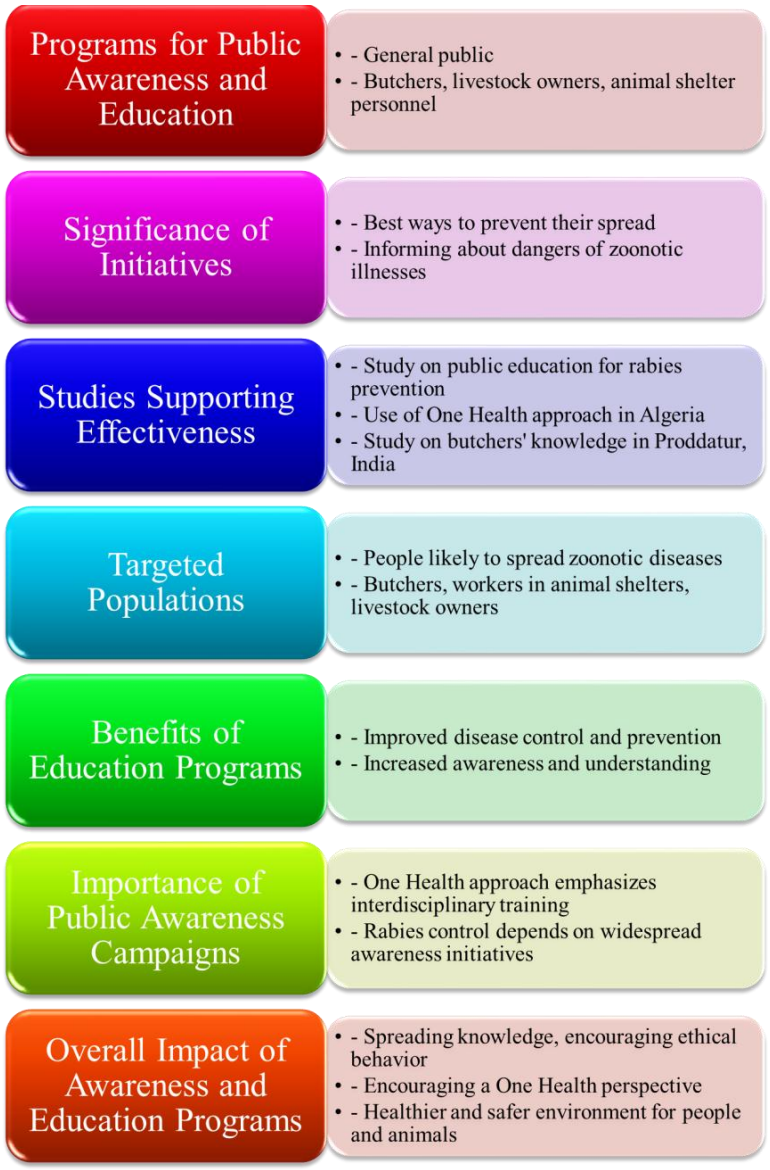


Fig. 3: Benefits of public awareness and education programs

such as vaccination and deworming programs for animals. In order to diagnose zoonosis early, report it quickly, and successfully intervene, it is essential to educate and raise community awareness about it. Understanding the intricate relationships and shared dangers posed by zoonotic diseases requires the application of One Health methodologies that integrate human, animal, and environmental health. Additionally, techniques for early zoonotic disease detection, research, and monitoring are being developed. (Marsh and Babcock 2015).

8.4. FACTORS INFLUENCING KNOWLEDGE, ATTITUDES, AND PRACTICES

8.4.1. CULTURAL, ECONOMIC, AND SOCIETAL FACTORS

Cultural, economic, and sociological variables significantly influenced the occurrence and spread of zoonotic illnesses. Studies have shown how these parameters affect the dynamics of zoonotic disease

transmission. Cultural customs and beliefs may have an impact on how people handle, consume, and interact with animals, which may have an impact on the risk of zoonotic disease transmission (Delabouglise et al. 2017). Particularly in situations with limited resources, economic issues, such as poverty and a lack of proper healthcare infrastructure, can contribute to the persistence and spread of zoonotic illnesses (Narrod et al. 2012). Social norms, population density, and globalization are societal elements that can influence how zoonotic disease patterns arise and spread. (Thornhill et al. 2010). To address the underlying socio-cultural and economic causes of disease transmission, these variables interact in complicated ways and must be taken into account in zoonotic disease prevention and control efforts as shown in Table 1 (Holt et al. 2021).

8.4.2. EDUCATIONAL PROGRAMS AND AWARENESS CAMPAIGNS

Educational initiatives and awareness campaigns significantly influenced the control and prevention of zoonotic illnesses. These programs are designed to raise awareness of zoonotic illnesses among a variety of target groups and to change their attitudes and behaviors toward them. Studies have revealed that these initiatives can effectively increase awareness and encourage behavior change (Saegerman et al. 2012). For instance, research examining awareness among hunters and dealers in Sierra Leone discovered that a program of education aimed at the bush meat trade successfully reduced the spread of zoonotic diseases and raised participants' knowledge (Subramanian et al. 2012). These programs give essential information on how diseases spread, how to prevent them, and how crucial early detection and treatment are, enabling people and communities to respond appropriately (Moutos et al. 2022). The burden of zoonotic illnesses is reduced. Educational programs and awareness campaigns that increase awareness and knowledge promote public health.

8.4.3. ACCESSIBILITY TO HEALTHCARE AND VETERINARY SERVICES

By encouraging knowledge, behavior modification, and preventive actions, educational programs and awareness campaigns significantly influence zoonotic illnesses. Studies have demonstrated the value of such programs in boosting zoonotic disease knowledge and awareness among various communities. For instance, a program in Sierra Leone that educated hunters and dealers on the risk of zoonotic diseases brought on by the bushmeat trade was successful in assessing that risk (Subramanian et al. 2012). These initiatives help to strengthen infection control procedures, surveillance systems, and biosecurity measures (Nampanya et al. 2012). Educational programs and awareness campaigns are addressing the variables impacting disease transmission and control by focusing on certain populations or professions, such as veterinarians or cattle farmers, and raising awareness (Moutos et al. 2022). Additionally, they stress the value of early detection, immunization, and good hygiene habits in preventing zoonotic infections (Usuwa et al. 2020). Overall, these programs are extremely important for raising the awareness, information, and behaviors required for zoonotic disease prevention and management.

8.5. IMPACT OF KNOWLEDGE, ATTITUDES, AND PRACTICES ON ZOONOTIC DISEASES

The reduction of disease transmission, the improvement of public health, and the implications for policy-making and interventions are just a few of the many elements that knowledge, attitudes, and practices related to zoonotic diseases have a significant impact on. Studies have emphasized the importance of these elements in dealing with zoonotic illnesses and their effects. For instance, in

the case of dengue fever, public knowledge, attitudes, and practices are vital in influencing preventative behaviors and vaccination acceptance, which reduces the spread of disease (Shafie et al. 2023). In order to execute successful interventions, policy-making benefits from comprehensive knowledge regarding zoonotic diseases that take into account both human and animal health. The One Health approach, which combines knowledge from various disciplines, assists in determining how interventions affect the spread of disease and guides policy decisions (Van Herten and Bovenkerk 2021). Furthermore, interventions influenced by knowledge, attitudes, and practices are responsible for the improvement in public health outcomes. For instance, food safety guidelines-based health interventions have been successful in lowering food borne illness and related disorders (Dilley et al. 2012). These interventions take into account social determinants of health and seek equitable results (Richard et al. 2021). Overall, zoonotic illnesses are affected in a variety of ways by knowledge, attitudes, and practices, including disease prevention, enhancing public health, and guiding policy-making and interventions as shown in Graph 1.

9. NEGLECTED ZOONOSIS

Neglected zoonosis usually receives minimal attention and resources for prevention, diagnosis, and treatment, in contrast to well-known zoonotic diseases like rabies or Ebola. These illnesses disproportionately affected low-income groups, particularly those in rural areas with scant access to resources and healthcare. Poverty, poor hygiene, inadequate veterinary care, and a lack of knowledge and resources for preventative and control measures are all factors that contribute to neglected zoonosis as shown in Fig. 4. These illnesses usually receive less attention from the international health community as compared to other severe diseases like malaria, HIV/AIDS, or tuberculosis. (Bangert et al. 2017). On the other side, neglected zoonosis can have disastrous effects on the afflicted community, including sickness, disability, and death. By affecting agriculture, general livelihoods, and livestock production, they can also have an economic impact. Numerous neglected zoonosis is endemic to specific regions and has intricate animal and human transmission cycles. Brucellosis, leptospirosis, cysticercosis, rabies, and zoonotic helminth illnesses like echinococcosis are examples of neglected zoonosis (Cutler et al. 2010).

10. CHALLENGES AND FUTURE DIRECTIONS

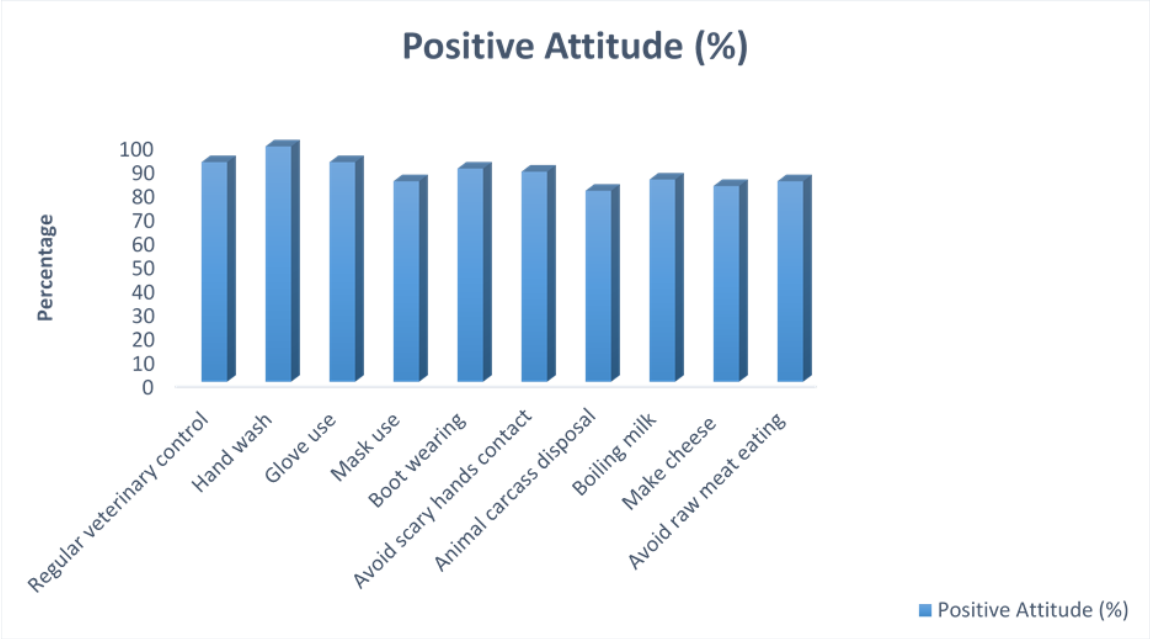
10.1. BARRIERS TO IMPROVING KNOWLEDGE, ATTITUDES, AND PRACTICES

There are a number of obstacles that inhibit advancement in disease prevention and control with regard to improving zoonotic disease knowledge, attitudes, and practices. These obstacles have been noted in various circumstances by studies. For instance, zoonotic disease risks and the practices utilized to reduce such risks were shown to create major obstacles in smallholder communities in Ethiopia (Alemayehu et al. 2021). Lack of disease surveillance and inadequate training of medical personnel are two obstacles to receiving post-exposure care for rabies in Uganda (Bonaparte et al. 2021). Similar obstacles existed in the Yucatan Peninsula of Mexico for better vector control of the Chagas disease, such as knowledge gaps and low community awareness (Rosecrans et al. 2014). Improvements in zoonotic disease knowledge and practices may also be hindered by sociocultural and access to healthcare services issues (Harris and Armién 2020). Effective interventions and the promotion of behavior change in zoonotic disease prevention and control efforts depend on recognizing and addressing these hurdles.

Table 1: The educational level of the farmers who participated in the study dealt with the knowledge, attitude, and practice in regard to zoonotic diseases (Özlü et al. 2020).

Educational status	Positive knowledge level (n)%
Illiterate	30 (19.9)
Literate	32 (21.2)
Elementary School	51 (33.8)
Secondary School	23 (15.2)
High School	8 (5.3)
University	7 (4.6)

n = Number of cattle Farmers



Graph 1: The rates of positive attitudes and practices of the farmers in regard to zoonotic disease and protection against their contamination. Data was presented in tabular form (Özlü et al. 2020)

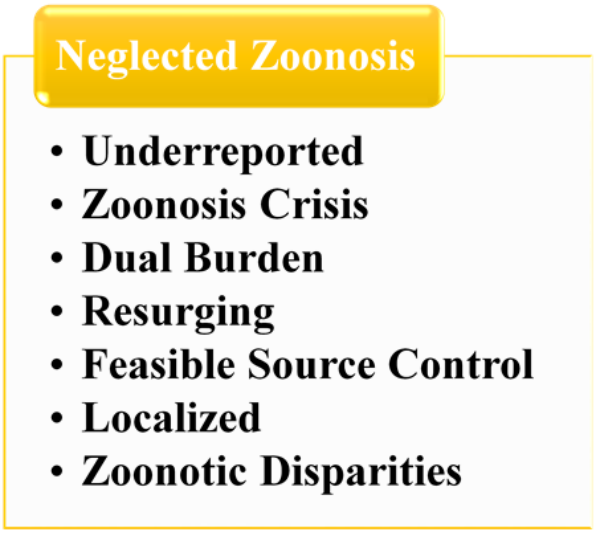


Fig. 4: Basic features of neglected zoonotic diseases (WHO 2013)

11. FUTURE RESEARCH DIRECTIONS AND RECOMMENDATIONS

To improve disease prevention and control efforts, future research directions and suggestions for boosting understanding, attitudes, and practices relating to zoonotic illnesses are encouraged. Further research is necessary in a number of specialized areas. Studies, for instance, indicate that future interventions should use community-based strategies and concentrate on decreasing barriers to carrying out advised preventative practices. Designing successful interventions requires an understanding of the socio-cultural factors that influence behavior change and the acceptance of preventive measures (Harris and Armién. 2020). In addition, investigating the beliefs, behaviors, and practices of certain target groups, such as medical students and livestock farmers, might offer insightful information for customized interventions (Lincango-Naranjo et al. 2021). Future studies ought to address knowledge and awareness gaps regarding zoonotic illnesses and the usage of antibiotics (Farrell et al. 2021). Policymakers and public health experts may create evidence-based policies and recommendations for successfully avoiding and controlling zoonotic illnesses by filling in these research gaps.

12. CONCLUSION

In conclusion, it is crucial to comprehend zoonotic disease knowledge, attitudes, and practices (KAP) in order to prevent and stop the spread of these diseases. A holistic approach that considers the health of people, animals, and the environment is required for the prevention and control of zoonotic diseases since they have major effects on global health and the economy. Assessing public knowledge of zoonotic diseases may reveal gaps and misunderstandings that can promote the spread of the disease. The creation of individualized interventions and educational campaigns to promote risk-reduction behaviors and preventative measures is made possible by understanding people's attitudes and practices. Programs for educating the public, spreading accurate information, and promoting behavioral change are crucial for raising awareness. Both the general public and specific demographics like farmers, butchers, and livestock owners are targeted by these programs. In order to implement efficient preventative methods, it is essential to identify the transmission pathways and variables impacting transmission. Zoonotic illnesses can be spread through direct contact with infected animals, indirect contact with contaminated environments or objects, vector-borne transmission, foodborne transmission, airborne transmission, waterborne transmission, and fomite transmission. Understanding these pathways makes it easier to come up with efficient solutions to break the transmission chain. Healthcare professionals are crucial in disseminating knowledge about zoonotic diseases and promoting preventive measures. They are essential resources for the general public, patients, and other healthcare professionals in terms of knowledge and direction. Raising awareness and minimizing the impact on public health can be achieved by improving the knowledge and procedures of healthcare professionals about zoonotic diseases. Risk is affected by one's attitude towards zoonotic diseases, including how serious and susceptible they are seen to be. Reducing the spread of zoonotic diseases requires a positive attitude towards preventive measures like immunizations, cleanliness habits, and animal handling. It is possible to effectively control the spread of zoonotic diseases by promoting education, positive attitudes, and preventive measures. Last but not least, controlling and limiting the spread of zoonotic diseases requires knowledge of KAP related to those diseases. By filling in information gaps, promoting positive attitudes, and putting preventive measures into place, we can lessen the negative effects of zoonotic diseases on public health and safeguard the health of both people and animals. There is a need for greater research, public awareness campaigns, and multidisciplinary collaboration in the fight against zoonotic diseases and to safeguard world health.

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