Preventive Measures among Rural Women Regarding Vector Borne Diseases

Mary Mossad Aziz Zakhary[1], Ebtisam Mohamed Abd Elaal[2], Hedya Fathy Mohy El-Deen[3] and Wafaa Atta Mohammed[4]

(1) M.Sc. of Nursing Science (2016), Faculty of Nursing-Menufya University, Clinical Instructor at Benha Technical Nursing Institute, Egypt, (2) Professor of Community Health Nursing, Faculty of Nursing-Benha University, Egypt and (3, 4) Assistant Professor of Community Health Nursing, Faculty of Nursing-Benha University, Egypt.

Abstract

Background: Vector-borne diseases are a major cause of death and illness; every year there are more than 700,000 deaths from diseases such as malaria, dengue, schistosomiasis, human African trypanosomiasis, leishmaniasis, chagas disease, yellow fever, Japanese encephalitis. **Aim of the study:** Was to assess preventive measures among rural women regarding prevention of vector-borne diseases. **Design:** A descriptive research design was utilized. **Setting:** The study was conducted at Rural Health Unit in Sandanhur Village, Benha City in Qalybia Governorate. **Sample:** A simple random sample was used which included 177 women. **Tools:** Two tools were used**. Tool I:** A structured interviewing questionnaire to assess socio-demographic of the studied women, their knowledge and reported practices toward preventive measures regarding of vector born disease**. Tool II:** Assess studied women home environment as reported. **Results:** 31.1% of the studied rural women aged between 20 to less than 30 years old, 50.3% of the studied women had secondary education, 62.7% of them had poor total knowledge, 79.7% had unsatisfactory total preventive measures practices toward vector borne disease, and 64.4% of the studied rural women had unsanitary environment. **Conclusion:** There was a highly statistically significant positive correlation between the studied rural women's total knowledge and their total reported practices (P<0.001). **Recommendations:** Establish and implement of health educational program for rural women regarding preventive measure of vector borne disease.

Keywords: Preventive measures, Rural women, Vector borne disease.

Introduction

A vector is a living organism that transmits an infectious agent from an infected animal or a human to another animal or a human. Vectors frequently are insects, such as mosquitoes, ticks, flies, fleas, and lice. Most of these vectors resemble bloodsucking insects that produce disease-causing bacteria throughout the blood fluids of an infected host (human or animal) and then transmit the infection to a new host once it has multiplied. Once a vector becomes infectious, they are capable of transmitting the pathogen for the rest of its life during each subsequent bite/blood meal (**Mitra, 2023).**

Vector borne diseases are human illnesses caused by parasites, viruses and bacteria that are transmitted by vectors. Every year there are more than 700 000 deaths from diseases such as malaria, dengue, schistosomiasis, human African trypanosomiasis, Chagas disease, yellow fever and Japanese encephalitis. Since 2014, major outbreaks of dengue, malaria, chikungunya, yellow fever and Zika have afflicted populations, claimed lives, and overwhelmed health systems in many countries. Other diseases such as chikungunya, leishmaniasis and lymphatic

filariasis cause chronic suffering, life-long morbidity, disability and occasional stigmatization **(World Health Organization (WHO), 2024).**

Vector borne diseases affect most common rural communities and poorest population because people are living in poor living conditions and poor households, particularly where there is a lack of access to adequate housing, safe drinking water, the lack of adequate infrastructure including drainage and sanitation systems, and restrictions on access to health services, low resistance of people caused by malnutrition, lack of knowledge about of vector-borne diseases and it is symptoms **(Manikandan et al., 2023).**

Common signs and symptoms of vector borne diseases are fever, chills, sweating, headache, joint pain, abdominal pain, nausea, vomiting, fatigue, muscle ache and rash. Most patients recover fully from the vector borne disease however, occasional cases suffer from severe complications who are not early detected or diagnosed **(WHO, 2022).**

Protective measures are very important to reduce and prevent the spread of vector borne disease. Promoting and enabling the use of long-lasting insecticidal nets, use long sleeve protective clothes, indoor residual spraying, early diagnosis and prompt treatment of positive cases for control and strengthened surveillance and active case detection activities for elimination of vector borne disease. Each of these activities are used with varying levels of emphasis for each of the intervention phases of vector born disease control, prevention and elimination **(Awasthi et al., 2024).**

Rural communities are the most common for vector borne disease transmission and between rural populations. This is primarily because rural dwellings are typically constructed with adobe, or plant materials, additionally customary practices such as stockpiling materials and establishing animal enclosures in per domiciliary areas further elevate the risk. Moreover, the proximity of rural households to wilderness environments, where activities like agriculture and cattle farming are common, facilitates contact with the vector **(De Sousa Leite et al., 2024).**

Rural women have important role in preventing vector born disease, and use protection measure to prevent bites from vector be sure to use screens on doors and windows, repair broken or damaged screens, have individual wear long-sleeved shirts, long pants, shoes, and socks when they go outside and use mosquito netting over their beds at night, use insect repellent as directed on individual, limit the amount of time individuals spend outside during the day, don't give vector places to breed and lay their eggs in water, so get rid of standing water in things like containers and be sure to change the water in birdbaths, dog bowls, and flower vases at least once a week **(Ayed et al., 2024).**

Significance of the study

The special geographic location of Egypt aggravates the complexity and difficulty of vector -borne virus. At least seven VBDs of public health concern are prevalent in Egypt, including schistosomiasis, fascioliasis, lymphatic filariasis, leishmaniasis, malaria, dengue, and Rift Valley fever. Although many of these diseases are preventable by using evidence-based protective measures, surveillance and control. scientific awareness must be spread to prevent these diseases and contribute to the applied aspects and specialized centers inside Egypt and at the global level (**Eassa & Abd El-Wahab, 2022).**

Aim of the study: This study aimed to assess preventive measures among rural women regarding vector borne diseases

Research questions:

1. What is the studied rural women level of knowledge regarding preventive measure of vector borne diseases?
2. What is the studied rural women' reported practices regarding preventive measure of vector borne diseases?
3. Is there a correlation between knowledge of rural women and their reported practices regarding preventive measure of vector borne diseases?

Subjects and Method:

Research design:

Descriptive research design was used to carry out this study.

Setting:

This study was conducted at the Rural Health Unit at Sandanhur Village, at Banha city, in Qalyubia Governorate.

Sampling:

Simple random sample was used to complete this study. The total number of women attended to previously mentioned setting last year (2024) was 320

Sample size was calculated using the following equation

$$n = \frac{N}{1 + N\,(e)^2}$$

Where 'n' is sample size

'N' is total Number of all woman attended to previously mentioned setting N=320

'e' is Coefficient factor = 0.05

Sample size = 177

Tools of data collection

Two tools were used in this study

Tool I: A Structured Interviewing questionnaire: It was developed by researchers based on literature review of the current and past available national and international references. It was composed of the following three parts:

Part I: Socio-demographic characteristics of studied women which consisted of 7questions e.g. age, level of education, marital status, occupation, number of family members, number of room, and crowding index.

Part II: It was concerned with knowledge of studied rural women regarding vector born disease which included: included 24 closed ended questions about: (meaning of vectors, types of vectors, diseases transmitted by mosquitoes, meaning of malaria, clinical manifestations of malaria, meaning of dengue fever, clinical manifestations of dengue fever, ways to prevent mosquitos' bites, flies that transmit infectious diseases, ways to prevent flies' bites, meaning of ticks, diseases transmitted by ticks, clinical manifestations of lyme disease, ways to prevent lyme disease, clinical manifestations of crimean fever, ways to prevent crimean fever, meaning of bug, acute symptoms of bug bites, chronic symptoms of bug bites, ways to prevent bug bites, meaning of schistosomiasis, methods of transmission of schistosomiasis as result of exposure to snails, clinical manifestations of schistosomiasis, and ways to prevent schistosomiasis.

Scoring system:

The scoring system for women knowledge was calculated as follows (2) scores for correct and complete answer, and (1) score for correct and incomplete answer, while (0) score for don't know answer. These scores were converted into a percent. The total knowledge score 48 points. The total knowledge score was considered good if the score of the total knowledge was ≥75 % (36 points), while considered average if it was 50-<75% (24<36 points), and considered poor if it was<50% (<24 points).

Part III: It was concerned with reported practices of studied rural woman regarding preventive measure of vector borne diseases It included 4 main items:

house cleaning (include 16 items), personal hygiene (include 6 items), caring with food

and drinks (include 5 items) and caring with pets at home (include 5 items).

Scoring system:

The scoring system for women ` practices was calculated as follows (2) scores for always practicing and (1) for sometimes practicing, while (0) for never practicing. These scores were converted into a percent. The total practices of studied rural women=64 points. The total reported practices score was considered satisfactory if the score of the total practices was ≥60% (≥38 points), while considered unsatisfactory if it was <60% (<38 points).

Tool II: It was concerned with assessment of studied rural women's home environment, it was adopted from **(Mansour et al., 2010)** as women reported, which included 8 items about: home sitting, ventilation, lighting, sources of drinking water, windows, garbage collection, kitchen, and sewage.

Scoring system:

The scoring system for studied women home environment was calculated as follows (2) scores for good and (1) score or average while (0) score for poor. These scores were converted into a percent. The studied women have sanitary environment if the score of the total environment items was >60% (>10 points), while considered unsanitary if it was ≤60 (≤10 point).

Content validity of the tools:

Content validity of the tool was done by three of Faculty's Staff Nursing, Benha university experts, from the Community Health Nursing Specialties who reviewed the tools for clarity, relevance, comprehensiveness, and applicability and give their opinion.

Reliability of the tool:

The reliability was done by Cronbach Alpha coefficient test which revealed that the tool consisted of relatively homogenous items as indicated by the moderate to high reliability of the tool. The internal consistency of the knowledge was 0.987 and practices were 0.992 while home environment 0.890.

Ethical consideration

An ethical issue was assured, written approval was obtained from Ethical Research Committee of Faculty of Nursing, Benha University, an written consent was obtained from women after complete description of the purpose and nature of the study to obtain their acceptance as well as to gain their cooperation. Moreover, women were assured that all gathered information were kept confidential and were used only for the purpose of the study. The women had right to withdraw from study at any time without giving any reasons.

Pilot study:

The pilot study was carried out on 17 women who represented about 10% of the sample size. The pilot study was aimed to assess the tools clarity, applicability and time needed to fill each tool, completing the tools consumed about 30-45 minutes. No modifications were done, so the pilot study sample was included in the total sample.

Field work

Preparatory phase:

Preparation of the study design and data collection tools was based on extensive review of the current and past available national and international references related to the research title was done, using a journal, textbooks and internet search was done. This was necessary for the researcher to be acquainted with and oriented about aspects of the research problem as well as to assist in the development of data collection tools.

Data collection phase:

The data was collected from women who attended in the previously selected rural health unit through the interview with them. The study was conducted at a period of six months which started from the beginning of

March 2024 to end of the August 2024. The researchers attended two days/week for the health unit from 9.00 am to 12 pm., those days were Saturday and Wednesday to collect data with distributed instruction guidelines about preventive measures of vector borne disease to improve health, these days are chosen because increase the frequency of women in these days and these days appropriate for the researchers, the average number of interviewed women was between 3-4 women/day. The researcher applied interviewing questionnaire took 30-45 minutes. The nurse in rural health unit helped researchers in the data collection and in explaining the instructional guidelines to the women.

Statistical analysis

The statistical analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 25. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the arithmetic mean (X) and Standard Deviation (SD) for quantitative data. Qualitative variables were compared using chi square test (X^2). Correlation coefficient test (r) was used to test the correlation between studied variables.

Degrees of significance of results were considered as follows:

- $P<0.01$ highly statistically significant.
- $P<0.05$ statistically significant.
- $P\geq0.05$ not statistically significant.

Results

Table (1): Demonstrates that; 31.1% of the studied rural women aged between 20 to less than 30 years old, 50.3% of them had secondary education and 67.2% were housewives. Moreover, 76.3% of them were married. 59.9% and 44.1% of them had more than 5 family members, and less than 3 rooms in the house respectively, and their crowding index mean were 1.97±0.67.

Figure (1): Shows that; 13.6% of the studied rural women had a good total knowledge level, 23.7% of them had average total knowledge level, and 62.7% of them had poor total knowledge level about vector borne disease.

Figure (2): Shows that; 20.9% of studied rural women had satisfactory total reported practices regarding prevention of vector borne diseases and 79.1% of studied rural women had satisfactory total reported practices regarding prevention of vector borne diseases.

Figure (3): Shows that, 64.4% of the studied rural women had unsanitary environment, while 35.6% of them had sanitary environment.

Table (2): Reveals that; there was highly statistically significant positive correlation between studied rural women's total knowledge and their total reported practices ($p=<0.001$).

Table (1): Frequency distribution of the studied rural women according to their socio-demographic characteristics (n=177).

Socio-demographic data	No.	%
Age (years)		
<20	33	18.6
20-<30	55	31.1
30-<40	53	30.0
≥ 40	36	20.3
Mean ± SD	**34.18±5.84**	
Education level		
Illiterate	21	11.9
Basic education	48	27.1
Secondary education	89	50.3
High education	19	10.7
Marital status		
Single	21	11.9
Married	135	76.3
Widowed	11	6.2
Divorced	10	5.6
Occupation		
Working	58	32.8
Housewife	119	67.2
Number of family members		
<3	26	14.7
3-<5	45	25.4
≥5	106	59.9
Number of rooms		
<3	78	44.1
3-<5	72	40.7
≥5	27	15.2
Crowding index		
<1	13	7.4
1-2	136	76.8
≥3	28	15.8

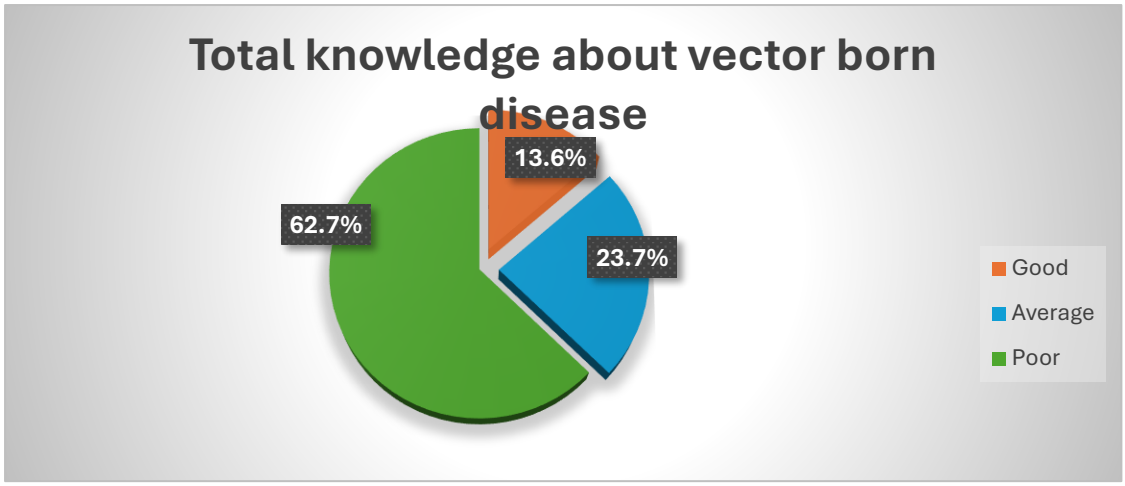

Figure (1): Total studied rural women knowledge regarding vector born disease (n=177).

Figure (2): Distribution of studied rural women total reported practices regarding preventive measure of vector borne diseases (n=177).

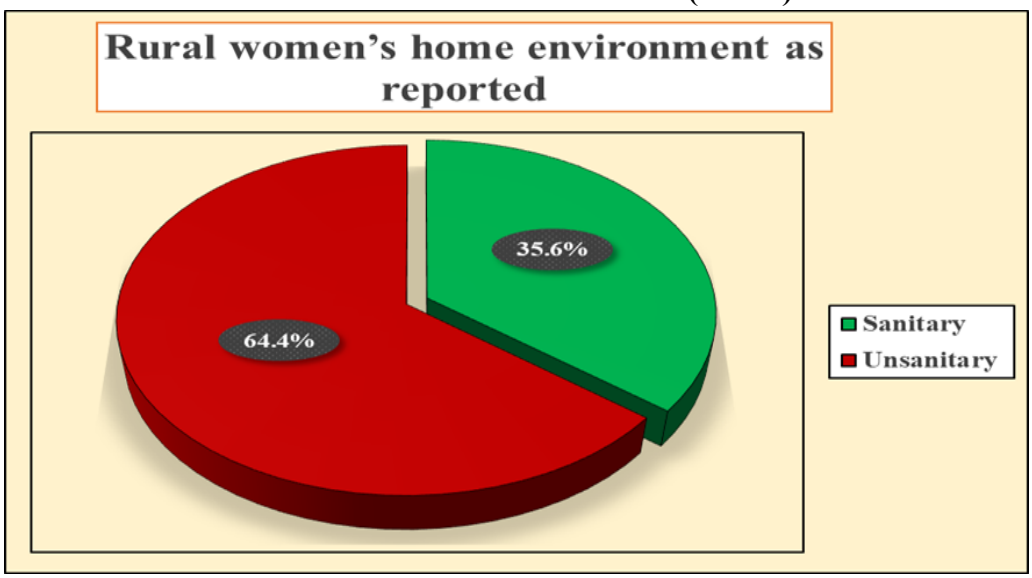

Figure (3): Studied rural women home environment as women reported (n=177).

Table (2): Correlation between studied rural women total knowledge and their total reported practices (n=177).

Variables	Total reported practices score	
	r	P
Total knowledge score	0.760	0.000**

Discussion

Vector borne diseases account for over 17% of all infectious disease resulting every year in more than one billion deaths. The burden of these diseases is linked to the challenges of prevention and control, particularly because there is no vaccine for most of them. Vector borne diseases pose a major threat to the health of the societies around the world. They are caused by parasites, viruses and bacteria transmitted to human by mosquitoes, sandflies, bugs, ticks, mites and lice. The major global vector borne diseases of the human includes malaria, dengue, lymphatic filariasis, chikungunya and Japanese encephalitis **(Shincy & Suman., 2024).**

Regarding to number of family members, the current result showed that slightly less than three fifths of them had more than 5 family members, and approximately two fifths of them had less than 3 rooms in the house respectively. These findings were in the same line with **Hassan & Elsehry (2022),** who studied "Knowledge, self-reported practices, and believes of rural women about household solid waste management at El Gharbia governorate, El Mehalla El Kobra, in Egypt" (n=200), and reported that about more than half of the rural women had more than 5 family members, and approximately two fifth of them had 3 rooms in the house.

As regards to the studied women total knowledge level about vector born disease, the current study illustrated that; more than tenth of them had good total knowledge level and less than one quarter of them had average total knowledge level while more than three fifths had poor total knowledge level regarding vector borne diseases. This finding disagreed **Kurmin et al., (2024),** who studied "Vector knowledge, attitudes, and practices in relation to malaria transmission in Bauchi state, in Nigeria" (n=120), and revealed that; more than half (54%) of participants had good total knowledge, and more than quarter (25.3%) had average knowledge while one fifth (20.3%) had poor total knowledge on vector born disease. In the point of view of the researcher, this is might due to the women who live in rural community not able to obtain correct information about the vector born disease and how to prevent it.

Regarding to the studied rural women total reported practices about preventive measure of vector born disease, the current study showed that, less than one quarter of studied women had satisfactory total reported practices level, while more than three quarters of studied women had unsatisfactory total reported practices. This finding agreed with **Kumaran et al., (2018),** who studied "Dengue knowledge, attitudes and practices and their impact on community-based vector control in rural Cambodia, in Cambodia" (n=107), and revealed that; one quarter (26%) of the studied resident had satisfactory total practices and three quarters (76.5%) of

resident had unsatisfactory total reported practices. In the point of view of the researchers this is might due to lack women knowledge about importance of personal hygiene and use of protective measure is very important to maintain health and prevent of vector borne diseases.

Concerning the studied rural women' home environment, the current study illustrated that; more than three fifths of the studied women had unsanitary environment, while one third of them had sanitary environment. This finding was compatible with **Nigusie et al., (2021),** who studied "Vector-borne diseases and associated factors in the rural communities of northwest Ethiopia in Ethiopia" (n=216), and revealed that, three fifths (62.6%) of the studied women had unsanitary environment and more than one third (36.2%) had sanitary environment. In the point of view of the researchers, this is might due to lack of women knowledge about important of environmental hygiene and sanitation to prevent vector-borne diseases and lack of knowledge about lack of clean home environment is suitable for most of the causative agents of vector borne diseases.

Regarding correlation between total knowledge and practices among studied women, the current study revealed that; there was highly statistically significant positive correlation between studied rural women's total knowledge and their total reported practices (p=<0.001). This finding was different with **Phuyal et al., (2024),** who studied "The knowledge, attitude and practice of community people on dengue fever in Central Nepal: a cross-sectional study, in Nepal" (n= 96), and found that; there was no statistically significant correlations between the knowledge and practice domains. In the point of view of the researchers this is might due lack of women knowledge about the preventive measure of vector born disease lead to decrease women practices to prevent the vector borne diseases

Conclusion:

Less than one third of the studied rural women aged between 20 to less than 30 years old, with mean age 34.18±5.84 years, one half of studied rural women had secondary education and slightly less than three fifth of studied women had more than 5 family members, and approximately two fifth of them had less than 3 rooms in the house and their crowding index 1.97±0.67. In addition nearly three fifths of the studied rural women had poor total knowledge level, while more than one fifth had average total knowledge level, while about tenth had good total knowledge level. Also more than three quarters of studied women had unsatisfactory total practices toward preventive measure regarding the vector borne diseases. There was highly statistically significant positive correlation between studied rural women total knowledge and their total reported practices (p=<0.001).

Recommendations:

- Establish and implement of health educational program for rural women regarding preventive measure of vector born disease.
- Distribute guidelines and handbooks for rural women about management, diagnosis, prevention and control of vector born disease.

References

Awasthi, R., Jancey, J., Clements, C., Rai, R., & Leavy, E. (2024). Community engagement approaches for malaria prevention, control and elimination: a scoping review. BMJ open, 14(2), e081982. Available at: https://bmjopen.bmj.com/content/14/2/e081982.abstract. Accessed on 28January 2025.

Ayed, M., Elsayed, N., Mohamedn, H., & Elbilgahy, A. (2024). Effect of educational guidelines on mothers' knowledge, attitude, and practice regarding dengue fever complications Prevention among their Children, Egyptian Journal of Health Care, 15 (1), 43-59. Available at: https://ejhc.journals.ekb.eg/article_336403.html. Accessed on 1 January 2025.

De Sousa Leite, L., De Rezende Feres, V., & Scalize, S. (2024). Predictor variables in the spread of chagas disease in rural areas. Pathogens, 13(5), 394. Available at: https://www.mdpi.com/20760817/13/5/394. Accessed on 15 November 2024.

Eassa, M., & Abd El-Wahab, W. (2022). Vector-Borne diseases in Egypt: Present status and accelerating toward elimination. Journal of Vector Borne Diseases, 59(2), 127-138.

Hassan, A., & Elsehry, M., (2022). Knowledge, self- reported practices, and believes of rural women about household solid waste management at El Gharbia governorate. Tanta Scientific Nursing Journal, 25(2), 146-173.

Kumaran, E., Keo, V., Sokha, L., Sam B., Chan, V., & Hustedt, J. (2018). Dengue knowledge, attitudes and practices and their impact on community-based vector control in rural Cambodia. PLoS neglected tropical diseases, 12(2), e0006268. Available at: https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0006268. Accessed on 3 January 2025.

Kurmin, M., Nanvyat, N., Lapang, P., Mafuyai, J., Luka, I., Akwashiki, O., & Mwansat, S. (2024). Vectors, knowledge, attitudes, and practices in relation to malaria transmission in Bauchi State, Nigeria. Journal of Vector Borne Diseases, 61(2), 176-182. Available at: https://journals.lww.com/jvbd/fulltext/2024/61020/vectors,_knowledge,_attitude,_and_practices_in.4.aspx. Accessed on 10 February 2025.

Manikandan, S., Mathivanan, A., Bora, B., Hemaladkshmi, P., Abhisubesh, V., & Poopathi, S. (2023). A review on vector borne disease transmission: Current strategies of mosquito vector control. Indian Journal of Entomology, 503-513. Available at: https://www.indianentomology.org/inde.php/ije/article/view/593 Accessed on 2 February 2025.

Mansour, H., Shoulah, A., Soliman, N., Abd EL Hameed, H., Megallaa, N. (2021). Effect of orphanage home environment on health statous among school age children in kalyubia Governorate. Master degree, Community health nursing, faculty of nursing, Benha University. Pp 8,9.

Mitra, A. (2023). Understanding disease causation, Epidemiology for Dummies,1sted., John Wiley & Sons, Canada, Pp.110-116.

Nigusie, A., Gizaw, Z., Gebrehiwot, M., & Destaw, B. (2021). Vector-borne diseases and associated factors in the rural communities of northwest Ethiopia: a community-based cross-sectional study. Environmental Health Insights, 15, 11786302211043049. Available at: https://journals.sagepub.com/doi/abs/10.1177/11786302211043049accessed on 4 Fep 2025.

Phuyal, M., Kramer, M., Kuch, U., Magdeburg, A., Groneberg, A., Lamichhane, M., & Müller, R. (2024). The knowledge, attitude and practice of community people on dengue fever in Central Nepal: a cross-sectional study. BMC Infectious Diseases, 22(1), 454. Available at: https://link.springer.com/article/10.1186/s12879-022-07404-4 .Accessed on 20 December 2024.

Shincy, L., & Suman, C. (2024). Assess the level of knowledge regarding prevention and control of vector borne diseases among

farmers. International Journal of Convergence in Healthcare, 4(1), 36-39. Available at: https://www.ijcih.com/index.php/ijcih/article/download/221/114 Accessed on 9 February 2025.

World Health Organization (WHO). (2022). Crimean-Congo haemorrhagic fever, Geneva. Https://Www.Who.Int/News-Room/Fact-Sheets/Detail/Crimean-Congo-Haemorrhagic accessed on 2 November 2024.

World Health Organization(WHO). (2024). Vector-borne. Available at: https://www.who.int/news-room/fact sheets/detail/vector-borne-diseases. Accessed on 29 January 2025**.**

الإجراءات الوقائية بين السيدات الريفيات بشأن الأمراض المنقولة بالنواقل

ماري مسعد عزيز زخاري- ابتسام محمد عبد العال- هدية فتحي محي الدين- وفاء عطا محمد

الأمراض المنقولة بالنواقل تعد سببًا رئيسيًا للوفاة؛ إذ يُسجل سنويًا أكثر من ٧٠٠,٠٠٠ حالة وفاة بسبب بعض الأمراض مثل الملاريا، وحمى الضنك، وداء البلهارسيا، وداء المثقبيات الأفريقي البشري، وداء الليشمانيات، وداء شاغاس، والحمى الصفراء، والتهاب الدماغ الياباني. لذلك هدفت الدراسة الي تقييم الإجراءات الوقائية بين السيدات الريفيات بشأن الوقاية من الأمراض المنقولة بالنواقل. وقد أجريت هذه الدراسة على ١٧٧ عينة عشوائية من السيدات الريفيات المترددين علي الوحدة الصحية بقرية سندنهور، مدينة بنها في محافظة القليوبية. حيث كشفت النتائج عن٦٢,٧٪ % من السيدات لديهم معرفة ضعيفة بشأن الامراض المنقولة بالنواقل، ٧٩,٧٪ % من السيدات لديهم مستوى غير مرضى من الممارسات و التدابير الوقائية من الأمراض المنقولة بالنواقل. وقد لخصت النتائج على أن هناك علاقة ارتباطية موجبة بين معلومات السيدات الريفيات وممارساتهم، وأوصت الدراسة وضع برنامج تثقيفي صحي للسيدات الريفيات بشأن التدابير الوقائية من الأمراض المنقولة بالنواقل.