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IAA Journal of Scientific Research 10(2):36-45, 2023. ISSN: 2736-7319

Prevalence and Associated risk Factors of Scabies among Inmates at Lira Main Prison, Lira City

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ABSTRACT

Scabies is a neglected tropical parasitic disease caused by sarcoptes scabiei, and is still a major public health problem worldwide, particularly in resource-limited regions. This work aims to assess the prevalence and associated risk factors of scabies among inmates at Lira main prison, Lira city. A cross sectional study was conducted among inmates at Lira main prison, Lira City. A total of 309 inmates completed the questionnaire and were included in the study. RESULTS: This study showed that 257 (83.17%) had experienced itchy rashes on the skin, while 52 (16.83%) did not. There was a strong association with number of inmates in the cell/ ward (p=0.0000) and with cells having >160 inmates having the highest number of cases 142(92.81%). Change of clothes (p=0.001) with the inmates changing once a month 135(91.22%) and direct contact with colleagues (p=0.0001) were associated with scabies. Of the 309 inmates who participated in the study, majority were males 275 (89.00%). Most of the inmates who suffered from scabies, 84(91.30%) were between the age group of 18-30 years. 90(91.84%) of those who suffered from scabies were Catholics, the highest number of participants had rashes all over the body 162 (63.00%), and 130(87.84%) who suffered from scabies had attained primary education. In conclusion, scabies was still one of the most important health problem with a very high prevalence among the inmates. Overcrowding in the cells and shortage of personal hygiene materials as well as socio-demographic factors contributed to scabies infestation among the inmates.

Keywords: scabies, inmates, health problem and Lira city.

INTRODUCTION

Scabies is an infestation caused by sarcoptes scabiei var. hominis and was noted as a neglected tropical parasitic disease (NTD) that was among the major public health problems worldwide, particularly in resource-poor regions like Uganda. It affected about 200 million people globally, with an estimated prevalence that range from 0.2 to 71% hence the burden of scabies infestation and their complications impose a major cost on healthcare systems [1].

The scabies mites spread by prolonged direct skin to skin contact with a person who has scabies, sexual partners and household members, and sometimes indirectly by sharing clothes, towels, or beddings used by infested individuals. A tiny scabies mite burrows into the epidermis of the skin where it lives and lays its eggs. The most common symptoms of scabies include severe itching especially at night and a primary papular skin rash called a burrow that affects much of the body or be limited to common sites like interdigital space, wrist, elbow, armpit, penis, nipple, and buttocks and usually begin 3–6 weeks after primary infestation [2].

An outbreak of scabies occurs when cases are left untreated, and diagnosis delayed which is linked with secondary bacterial infection which may lead to cellulitis, folliculitis, boils, impetigo, or lymphangitis and may exacerbate other preexisting dermatoses such as eczema and psoriasis [3]. [4], suggested that overcrowding, poor hygiene, poor nutritional status, immigration, homelessness and sexual contact as the common predisposing factors for the infestation.

Problem statement

Scabies is a neglected tropical disease that affects more than 200 million people worldwide annually with the highest burden recorded in tropical and Sub-Saharan Africa [5].

[6], noted that several pupils of Lukodi primary school in Gulu district, Northern Uganda had not reported to school for fear of contracting scabies or to seek treatment with over 900 pupils infested with scabies and blamed the outbreak on poor sanitation and congestion in dormitories.

On a similar note, over 500 residents of Hoima district had been diagnosed with the infestation which was attributed to limited water, poor sanitation and personal hygiene leading to a serious outbreak and a big problem [7]. On the other hand, a report by URN, noted an outbreak of scabies especially among school going children and adults [8].

The Regional Health Coordinator, Mid-North Prison Services-Uganda, noted that many inmates were suffering from scabies, and this occurred in the months of October to November, 2020 when the highest peak were observed [9].

Scabies is a common public health problem yet no studies had been done in the study area, therefore, this study helped determine the prevalence and assessed risk factors of scabies among inmates at Lira Main Prison, Lira City and further recommended preventive and management measures to address the problem.

METHODOLOGY

Study Design

A cross sectional study [10] was conducted among inmates at Lira Main Prison, Lira City.

Study Area

The study was conducted at Lira Main Prison that was constructed in 1934. It has male and female section. The male section has 2 wards, upper and lower with a capacity of 500 inmates each, and is always full to beyond its capacity and by the time of conducting this study, there were a total of 1350 inmates, with some not able to find any space of sleep, and end up sleeping while seated on the floor leaning against one another. The female section has a capacity of about 50 inmates. It is located within Lira City, Police Road, neighboring Lira Regional Referral Hospital with coordinates of 2.2539331,32.8997505. It is located about 337 kilometers by road from Kampala, the capital city of Uganda. The inmates receive health care services from Lira Prison Health Centre III which is attached to the Prison Facility.

Study Population

The study population were all inmates at Lira main prison, Lira City.

Inclusion Criteria

All inmates (males and females) present at Lira main prison.

Exclusion Criteria

All the inmates not present at the time of data collection.

All inmates in other prison facilities.

Sample Size Determination

The sample size determination was based on [11] with an error of 5% and a confidence interval of 95% [11]. By calculation as below, the sample size was 309 inmates.

Yamane (1967:886) [11] $n = \frac{N}{1 + N(e)^2}$ n = required sample size e= Level of precision 0.05 N = Population Size (Total number of inmates)	$n = \frac{1350}{1+1350(0.05)^2}$ $= \frac{1350}{1+1350(0.0025)}$ $= \frac{1350}{1+3.375}$ $= 309$ n= 309

Sampling Technique

By use of purposive sampling technique, both male and female inmates were chosen since they were all affected by the scabies, and also because scabies occurs commonly in such institutions.

Stratified random sampling was used to divide the study population into strata of gender (male or female). Two lists of inmates separated according to gender were obtained from the prison authority fully numbered from 1 up to 1200 for males and 150 for females. From each list a sample was obtained proportionately to reach the sample size required.

The formula below was used to determine the sample size in each group.

X= (K/N)*n Where,

K= population in each stratum

N= Study population

X= Number of sample required from each stratum

n= sample size

Therefore, the numbers of males were 275 and females were 34 accordingly.

Thereafter, simple random sampling was used to identify the participants who got involved in the research from each stratum. This was done by numbering small pieces of papers 1 to 1200 in one box for males and another box containing small pieces of papers numbered from 1 to 150 for the females. Therefore, the number chosen corresponded to the participant's name on the sampling frame and he/she stood a chance to be included in the research. This was repeated until the required number from each stratum was obtained.

Data collection methods

Each selected inmate was approached, their consent taken by explaining what the research was all about and emphasizing confidentiality once the information was attained. Then the questions were read to them and interpreted in the local language while the research assistants recorded the answers on the questionnaire for those not able to write on each day of the activity. This was done so since some inmates did not know how to read and write.

The research team on each date of data collection established the number of inmates to participate in the study. Approximately, 30 respondents were interviewed daily from Monday to Friday for two weeks.

The data was collected for over a period of three weeks (30 respondents per day) from the participants who were selected using the above methods. Finally, completed questionnaires were collected and kept under lock by the researcher.

Quality Control

Validity

The self- administered, semi structured questionnaires were assessed for content validity by the research supervisor. They were edited, and questionnaires pretested on 10 inmates to check on the errors and ensure accuracy and relevancy.

Reliability

The questionnaire was developed based on the objectives of the study. Pre-test was conducted and any ambiguity was modified based on pre-test findings.

A total of 6 data collectors were recruited for data collection. A day training was given about the basic techniques of the data collection procedure.

Data Processing and Analysis

Quantitative data analysis was involved, numerical values from which descriptive statistics such as frequency tables, mean, and standard deviation was used to present participants and their characteristics as appropriate. Data generated by questionnaires were entered, coded, cleaned, organized and edited using Microsoft excel to ensure quality and accuracy of the findings before analysis. The Epi Info 7 software was then used for data analysis at the level of significance of $P<0.05$.

Ethical Considerations

The study was approved by the research committee of Kampala International University- Western campus. The participants were informed on the aim and objectives of the study and written informed consents obtained prior to data collection. Participants also had the right to withdraw from participating in the study anytime during data collection. Confidentiality of the data was assured by collecting information anonymously and not including personal identifiers [12].

RESULTS

Socio-demographic characteristics

A total of 309 inmates participated in the study with more than half of the participants being males 275 (89.00%), and 34 (11.00%) were females of age bracket 18-30 years dominating at 35.28% (109). Up to 38.19 % (118) of the inmates were Catholics, with 55.02 % (170) having attained primary education. Most of the participants were from upper cell 63.11 % (195) as seen in the table below.

Table 1: Showing Demographic characteristics of inmates (n=309) in the study

AGE	Frequency (n=309)	Percent (100%)
18-30	109	35.28%
31-42	85	27.51%
43-54	74	23.95%
Above 54	41	13.27%
GENDER		
Male	275	89.00%
Female	34	11.00%
RELIGION		
Anglican	108	34.95%
Catholic	118	38.19%
Moslem	56	18.12%
Others	27	8.74%
CELL/ WARD		
Lower	114	36.89%
Upper	195	63.11%
EDUCATIONAL LEVEL		
None	42	13.59%
Primary	170	55.02%
Secondary	82	26.54%
Tertiary	15	4.85%

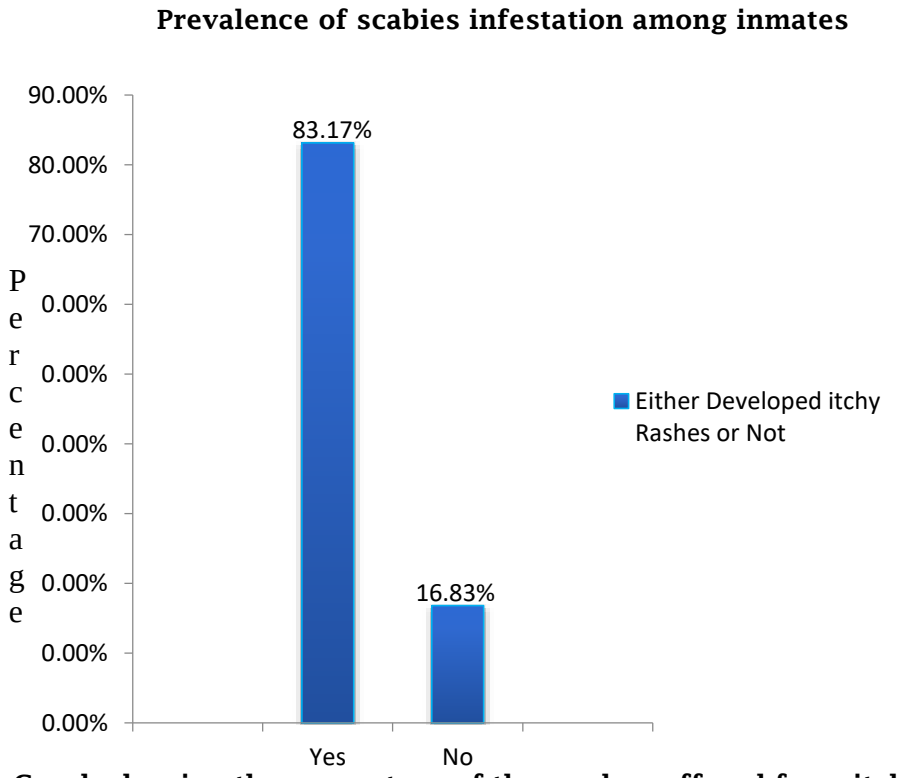

Figure 1: Graph showing the percentage of those who suffered from itchy rashes or not (n=309)

Out of 309 participants who got involved in the study, 257(83.17%) had experienced itchy rashes on the skin, while 52(16.83%) did not.

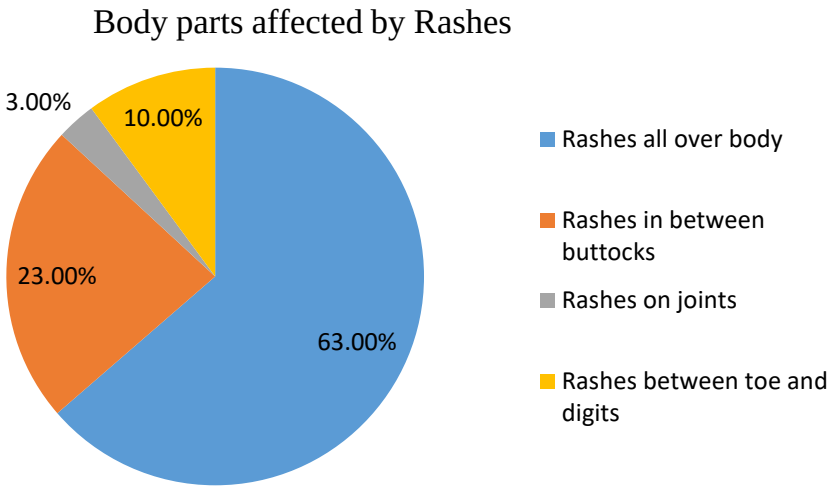

Figure 2: Showing the parts of the body affected by itchy rashes as expressed by those who suffered the scabies infestation (n=257).

Of the 257 who had experienced itchy rashes on the skin, the highest number of participants had rashes all over the body 162 (63.00%), followed by rashes between the buttocks 59 (23%), while only 3.00% had rashes on the joints.

Risk factors associated with scabies

According to the table below, there was a strong association with members in the cell/ ward (p= 0.0000) with cells having between 151-250 having the highest number of cases 142(92.81%). Change of clothes (p=0.001) with the inmates changing once a month 135(91.22%) and direct contact with fellow inmates (p=0.0001) were as well associated with scabies.

Table 2: Association of risk factors with scabies infestation among inmates (n=309).

	Develop Itchy Rashes on The Skin			
Wash hand	**Yes**	**No**	**Chi-square**	**p-Value**
Less than 5 times daily	196(91.16%)	19(8.84%)		
More than 5 times daily	30(71.43%)	12(28.57%)	–	–
Use of detergent or not				
Water and Soap	78(83.87%)	15(16.13%)		
Water only	148(90.42%)	16(9.76%)	–	–
Members in the cell/ ward				
1- 80	30(85.71%)	11(26.83%)	21.3478	0.0000*
81- 160	54(85.71%)	9(14.29%)		
>160	k	11(7.19%)		
Number of Bath				
<Three times a week	53(84.13%)	10(15.87%)	4.9031	0.0862
Once a day (7 times a week)	137(87.82%)	19(12.18%)		
Once in a week	36(94.74%)	2(5.26%)		
Change of clothes				
2 times in a week	44(84.62%)	8(15.38%)	16.3413	0.001*
Once a month	135(91.22%)	13(8.78%)		
Once a week	38(82.61%)	8(17.39%)		
Once in two weeks	9(81.82%)	2(18.18%)		
Share clothes with others				
Yes	51(96.23%)	2(3.77%)	_	_
No	175(85.78%)	29(14.22%)		
Share blankets and bedsheets				
Yes	30(85.71%)	59(14.29%)	_	_
No	196(88.29%)	26(11.71%)		
Place of sleep				
Bed	32(76.19%)	10(23.81%)	_	_
Floor	194(90.23%)	21(9.77%)		
Direct contact with fellow inmate				
Yes	225(91.46%)	21(8.54%)	18.1458	0.0001*
No	1(9.09%)	10(90.19%)		

Socio demographic factors associated with scabies

According to the table below, there was association between the socio demographic factors and scabies infestation. The factors included age (x^2 =12.3519, *p-value* = 0.0157) with most of the inmates in the age group of 18-30 years, religion (x^2 =8.5362, p-value= 0.0361) and those who were Catholics 90(91.84%) suffered most from scabies. Finally, level of education (x^2=21.4561, p-value=0.0000) with those with primary education 130(87.84%) being highly affected.

Table 3: Showing socio-demographic factors associated with scabies infestation (n=275)

	Develop itchy rashes on skin			
Age	**Yes**	**No**	**Chi- square**	**p- value**
18- 30	84(91.30%)	8(8.70%)	12.3519	0.0157
31-42	64(90.14%)	7(9.86%)		
43-54	49(79.03%)	13(20.97%)		
Above 54 years	29(90.63%)	3(9.38%)		
RELIGION				
Anglican	82(82.83%)	17(17.17%)	8.5362	0.0361
Catholic	90(91.84%)	8(8.16 %%)		
Moslem	40(88.89%)	5(11.11%)		
Others	13(86.67%)	2(13.33%)		
LEVEL OF EDUCATION				
None	22(91.67%)	2(8.33%)	21.4561	0.0000
Primary	130(87.84%)	18(12.16%)		
Secondary	63(87.50%)	9(12.50%)		
Tertiary	11(84.62%)	3(15.38%)		

DISCUSSION

Prevalence of scabies infestation among inmates

The study found out that 257(83.17%) of the inmates suffered from scabies in the last six months. It further noted that, there was overcrowding in the cells, and hence limited or shortage of personal hygiene materials to maintain personal hygiene and good sanitation.

This is in line with research conducted in Northwestern Ethiopia among children and adults noted prevalence at 251 (78.4%) [13]. It is however different from studies done in other places like southern Ethiopia where the prevalence was estimated at 2.3% [14] and in Kechabira district, Southern Ethiopia which noted an overall prevalence at 2.5% [15] as well as in Northern Ethiopia, Gonder town, among Yekolo Temari tribe where the prevalence was at 22.5% [16].

The study noted that this very high prevalence was attributed to the shared clothes, infrequent bathing and many inmates within the cells or wards and physical contact with colleagues contributed to the high prevalence of scabies since the inmates almost shared everything in the cells accompanied by the limited space due to overcrowding hence limited or shortage of personal hygiene materials to maintain personal hygiene and good sanitation.

The study further noted that majority of the respondents experienced itchy rashes on the skin, with the highest number of participants having rashes all over the body 162 (63.00%), followed by rashes between the buttocks 59 (23%), while 3.00% had rashes on the joints. This study seems to correlate with a study done by [17, 18] which pointed out that, the typical distribution of infestation

included areas between the fingers, buttocks, the wrists, axillae, groins, genitals, and the breasts in women and in infants and young children, the palms, soles and head (face, neck and scalp) are more commonly involved and that mites seem to avoid areas with a high density of pilosebaceous follicles.

Risk Factors associated with scabies infestation among inmates

According to the study findings, there was a strong association between these factors and scabies infestation; the factors included members in the cell/ ward (p= 0.0000) with cells having >160 inmates having the highest number of cases 142(92.81%). Change of clothes (p=0.001) by the inmates changing once a month 135(91.22%) and direct contact with fellow inmates (p=0.0001).

The study seems to correlate with other study findings like, in one study, members living in a house of single room, those with poor hygiene and members who shared clothes had very high-risk factors of scabies infestation [13]. In East Badewacho District, Southern Ethiopia, it was observed that scabies infestation were 2.6 times higher among families with members above 5 persons compared to those whose family size were below 5 members [19].

The above findings however do not agree with other studies example, in one study conducted in the central region of Cameroon, the number of baths less than once daily and number of laundries less than once weekly were the independent factors impacting scabies occurrence [20].

Socio -demographic factors associated with scabies infestation among inmates

In this study, there were significant relationships between the socio-demographic factors considered in the study and scabies infestation among the inmates. The factors included age (x^2 =12.3519, *p-value* = 0.0157) with most of the inmates in the age group of 18-30 years, religion (x^2 =8.5362, p-value= 0.0361) and those who were Catholics 90(91.84%) suffered most from scabies. Finally, level of education (x^2=21.4561, p-value=0.0000) with those with primary education 130(87.84%) being highly affected.

This particular study is in line with another study conducted in Ethiopia where the rate was significantly higher (85%) among those who had dropped-out of school [4]. In another study of [19], 75% of cases were found in the age group of 5 to 14 years. The above result does not conquer with the present study with most of the inmates in the age group of 18-30 years. However, this study result is concurrent with a study conducted in Iran among prisoners where the highest morbidity rates were among 20-29-year age group (55.2%) [21].

Therefore, the findings of the current study showed some similarities and also differences in comparison to the previous studies due to the different setup and locations in which the studies had been conducted.

Finally, age, religion and level of education were the socio-demographic factors that were associated with scabies infestation. Those who had attained primary education were highly affected because of the inadequate knowledge and limited skills to enable them get into employment hence many falling a culprit, and age group of 18- 30 years were the majority, of who were youth with limited education.

CONCLUSION

Prevalence of scabies among inmates

The results obtained from this study revealed that scabies was still one of the most important health problems among the inmates. The prevalence was very high at 83.17% which could have been attributed to the shared clothes, infrequent bathing and many members within the cells or wards. Physical contact with colleagues also contributed to the high prevalence of scabies since the inmates almost shared everything in the cells accompanied by the limited space due to overcrowding.

Risk factors associated with scabies infestation among inmates

According to the study findings, there was a strong association between the risk factors and scabies infestation; the factors included members in the same

cell/ ward (p= 0.0000) with cells having >160 inmates with the highest number of cases 142(92.81%). Change of clothes (p=0.001) with the inmates changing once a month 135(91.22%) and direct contact with colleagues (p=0.0001).

The current findings were found so since there was overcrowding in the cells and perhaps the limited or shortage of personal hygiene materials to maintain personal hygiene and good sanitation as well.

Socio demographic factors associated with scabies infestation among inmates

In this study, there were significant relationship between the socio-demographic factors considered in the study and scabies infestation among the inmates. The factors included age (x^2 =12.3519, *p-value* = 0.0157) with most of the inmates in the age group of 18-30 years, Religion (x^2 =8.5362, p-value= 0.0361) and those who were Catholics 90(91.84%) suffered most from scabies. Finally, level of education (x^2=21.4561, p-value=0.0000) with those with primary education 130(87.84%) being highly affected.

This meant that those who had attained primary education were highly affected because of the inadequate knowledge and limited skills to enable them get into employment hence many falling a culprit, and age group of 18- 30 years were the majority, of which they were youth with limited education.

Recommendation

- The government through the prisoner's administration should lobby for other infrastructures like buildings in prison to avoid overcrowding and direct contact with each other.
- Health education should be organized and awareness created on the importance of personal hygiene and good sanitation.
- There should be proper management of the cases in the health facility to minimize on the spread of the cases and active surveillance should be strengthened as much as possible to eradicate and avoid outbreaks in the cells or wards.
- Provision of personal hygiene kits like soap, different detergents by the prisoner's administration would be of paramount importance since the inmates are not able to afford some of these items.
- More studies should be carried out to evaluate the causes and impact of high prevalence of scabies in such institutions so as to create awareness and address such outbreaks timely and effectively.

REFERENCES

1. WHO(2017).Scabies.epidemiology.https://www.who.int/lymphatic_filariasis/epidemiology/scabies/en
2. Center for Disease Control. (2010). Scabies: Centers for Disease Control and Prevention guide line. https://www.cdc.gov/parasites/scabies/gen info/index .html.
3. Hay, R, J., Steer, A, C., Engelman, D. and Walton, S. (2012). Scabies in the developing world its prevalence, complications, and management. Clin Microbiol Infect; 18:313–23.
4. Wendemagegn, E. and Ashenafi, A. (2018). Investigation of a scabies outbreak in drought-affected areas in Ethiopia. Trop Med Infect Dis., 3:114
5. WHO. Neglected tropical diseases: scabies. Available from:https://www.who.int/neglected_diseases/diseases/scabies/en/. AccessedJuly27,2019.
6. Amono, R. A. (2019). Gulu district secretary for education, Ministry of Education and Sport.
7. Kabagenyi, N. (2020). Deputy District Health Officer. Scabies outbreak in Hoima.
8. Akwang, J. (2019). Uganda Radio Network (URN): Scabies Hit Katakwi Residents. https://ugandaradionetwork.net/story/scabies-hit-katakwi-resident
9. Asiku, T. (2020). The Regional Health Cordinator, Lira Main Prison, Lira city.

10. Ugwu, C. N. and Eze, V. H. U. (2023). Qualitative Research. *IDOSR of Computer and Applied Science*, *8*(1), 20–35.
11. Yamane, T. (1967). Statistics, An Introductory Analysis, 2nd Ed., New York: Harper and Row.
12. Ugwu Chinyere Nneoma, Eze Val Hyginus Udoka, Ugwu Jovita Nnenna, Ogenyi Fabian Chukwudi and Ugwu Okechukwu Paul-Chima (2023). Ethical Publication Issues in the Collection and Analysis of Research Data. Newport international journal of scientific and experimental sciences (NIJSES) 3(2): 132-140.
13. Belachew, S, A. and Kassie, A. (2018). Burden and drivers of Human Scabies among children and adults in Northwestern Ethiopia: The case of the neglected tropical disease. International Journal of Infectious Diseases 73(3–398).
14. Wondimu, W., Haji, Y. and Asnake, S. (2019). Scabies Outbreak investigation and risk factors in Kechabira district, Southern Ethiopia. *BMC Research Notes* **12(305)**,
15. Henok, D., Awrajaw, D., Destaw,B., Walelegn, W, Y. and Zemichael, G. (2018). Prevalence and associated factors of scabies among schoolchildren in Dabat district, northwest Ethiopia. Environmental Health and Preventive Medicine.https://doi.org/10.1186/s12199-019-0824-6
16. Yassine, H. M., Boyington, J. C., McTamney, P. M., Wei, C. J., Kanekiyo, M., Kong, W. P., Gallagher, J. R., Wang, L., Zhang, Y., Joyce, M. G., Lingwood, D., Moin, S. M., Andersen, H., Okuno, Y., Rao, S. S., Harris, A. K., Kwong, P. D., Mascola, J. R., Nabel, G. J. and Graham, B. S. (2015). Hemagglutinin-stem nanoparticles generate heterosubtypic influenza protection. *Nature medicine*, *21*(9), 1065–1070. https://doi.org/10.1038/nm.3927
17. Heukelbach, J., Wilcke, T., Winter, B. and Feldmeier, H. (2005). Epidemiology and morbidity of scabies and pediculosis capitis in resource-poor communities in Brazil [Internet]. Br J Dermatol., 153 (1):150–6. Available from: http://www.ncbi.nlm.nih.gov/pubmed/16029341
18. Monsel, G., Delaunay, P., Chosidow, O., Griffiths, C., Barker, J., Bleiker, T., Chalmers, R. and Creamer, D. (2016). Editors. Rook's textbook of dermatology. 9th ed. Hoboken: Wiley & Sons.
19. Jarso, S., Haji, Y. and Achamyelesh, G. (2018). Scabies Outbreak Investigation and Risk Factors in East Badewacho District, Southern Ethiopia. Hindawi Dermatology Research and Practice. Volume (10), Article ID 7276938,https://doi.org/10.1155/2018/7276938
20. Armand, P., Redd, R., Bsat, J., Mayuram, S., Giardino, A., Fisher, D. C., LaCasce, A. S., Jacobson, C., Davids, M. S., Brown, J. R., Weng, L., Wilkins, J., Faham, M., Freedman, A. S., Joyce, R. and Jacobsen, E. D. (2016). A phase 2 study of Rituximab-Bendamustine and Rituximab-Cytarabine for transplant-eligible patients with mantle cell lymphoma. *British journal of haematology*, *173*(1), 89–95. https://doi.org/10.1111/bjh.13929
21. Poudat, A. and Nasirian, H. (2017). Prevalence of Pediculosis and Scabies in the Prisoners of Bandar Abbas, Hormozgan Province, Iran. *Pakistan Journal of Biological Sciences, 10: 3967-3969.*DOI**:** 10.3923/pjbs.2007.3967.3969

Onyum Bonny (2023). Prevalence and Associated risk Factors of Scabies among Inmates at Lira Main Prison, Lira City. IAA Journal of Scientific Research 10(2):36-45