International Journal of Science and Healthcare Research
Vol. 9; Issue: 1; January-March 2024
Website: ijshr.com
Original Research Article *ISSN: 2455-7587*

Prevalence of Kala-Azar and Its Contributing Factors Among Rural Population in Selected Community of West Bengal

Pampa Sarkar[1], Dr. Aparna Ray[2], Jaya Mandal[3]

[1]Clinical Instructor, College of Nursing, North Bengal Medical College & Hospital Darjeeling, Pin - 734012
[2]R.N, R.M, M.N, Ph.D.(N), Reader, Govt. College of Nursing I.D.& B. G Hospital Campus, Kolkata -10
[3]Senior Lecturer, S.S.K.M College of Nursing, Kolkata-20

Corresponding Author: Pampa Sarkar

DOI: https://doi.org/10.52403/ijshr.20240143

ABSTRACT

Background: Kala-azar is a serious form of leishmaniasis. It is a long-term infectious disease. The study was aimed to assess the prevalence of Kala-azar, and it's contributing factors among the rural population.

Methods: In this retrospective study population was previously treated Kala-azar patients (Visceral Leishmaniasis and Post Kala-azar Dermal Leishmaniasis) from 2017 to 2021. The settings were villages under Kushmondi and Harirampur Rural Hospital under Dakshin Dinajpur. 90 samples were selected through Non-Probability Purposive sampling technique. Demographic data were collected by applying Semi structured interviewed schedule. Record analysis format was used to identify the prevalence of Kala-azar and the disease profile. An observational checklist and structured interview schedule were used to assess the contributing factors of Kala-azar.

Results: Maximum prevalence of Kala-azar (1.4%) seen in the year 2017. There were statistically significant mean differences among the contributing factors as the ANOVA test calculated F-value (2507.18) is higher than table value of F (2.60) with df (3, 356) at 0.05 level of significance. Environmental factors contributed more than other factors as the mean value (13.00) was more than other factors. There is a statistically significant relation between environmental factor with utilization of services, economic factors with socio-cultural factors & utilization of services, as well as socio- cultural factors with utilization of services as the p-value is <0.05, at 0.05 level of significance. There was a statistically significant association between contributing factors and selected demographic variables like age, gender as the calculated value of chi square 7.391 and 4.888 is higher than table value χ^2 (df)2=5.99 p ,χ^2 (df)1=3.84 p <0.05 at 0.05 level of significance.

Conclusion: The study has implications in nursing practice through the awareness of the rural population about the contributing factors of Kala-azar. The study concluded that the trends of prevalence were decreasing in nature and the environmental factors contributed more than other factors.

Key words: Prevalence, Kala-azar case, Environmental factors, Economic factors, Socio- cultural factors & Utilization of services.

INTRODUCTION:

Vector borne diseases were account for 17% of infection disease load[1].The contributing factor of the diseases were poor sanitation & cleanliness, lack of water drainage facility,

over population, poor hygiene practices and unplanned urbanization.

Visceral leishmaniasis (VL), or kala-azar, is a protozoan disease that, second only to malaria in numbers of mortalities, afflicts millions of people worldwide [2] VL is primarily approximate in East Africa, South Asia, South America, and Mediterranean Region, with an approximation of 50,000 to 90,000 new VL cases each year. Ninety percent of reported VL cases occur in Brazil, Ethiopia, India, Kenya, Somalia, South Sudan, and Sudan [3]. In 2015 the World Health Organization (WHO) divided VL as a neglected tropical disease (NTD) due to relatively minimal permitted attention from the public, resulting in high mortality rates (more than 20,000 in 2015), and endemic growing in poverty-stricken regions around the world [4,5]

Pigott et al. collected and summarized prevalence data reports of CL and VL from 1960 to 2012[6]**.** According to their encapsulated database, the worldwide VL pandemic has an effect on at least 55 countries and territories and another 45 countries have declared unspecified and borderline VL cases. Affected countries are detected primarily in Latin America, the Mediterranean basin, Northeastern Africa, and Asia. Moreover, VL epidemic historically happen most often in developing or agricultural countries because citizens are more likely to be in contact with disease transmission vectors such as dogs and mosquitoes [7].

According to the WHO neglected tropical diseases (NTD) report in 2007, VL is recognized as one of the NTDs [8]**.** The primary reason WHO divided VL as an NTD is that confirmed VL cases have reduced worldwide from approximately 60,000 to around 20,000 since around 2010 [9], However, thousands of VL cases may not be covered in the WHO VL approximation report [10] since some countries without public health information systems do not present their infection report data to WHO. Based on the approximation, there are 500,000 new cases of VL and more than 50,000 deaths from the VL each year [11]. In 2012, another research group from the WHO Leishmaniasis Control Team put right the number of VL estimation cases into 0.2-0.4 million, and the number of VL deaths into 20,000-40,000 [12,13]. Therefore, VL continues to be a significant and present threat to public health worldwide.

Chapmen CAL et. Al [14] conducted a study on trends of age distribution in the Indian subcontinent. The study discovered 13 infection prevalence and 7 VL incidence studies meeting the inclusion criteria. Statistical tests were doing to detect trends by age, and according to tested cut-off. Simple reversible catalytic models with age-independent and age-dependent infection rates were fitted to the prevalence data to estimate infection and reversion rates, and to prove different hypotheses about the origin of variation in these rates.

Rutte-Le AE et.al [15] conducted a study on control of Visceral Leishmaniasis through Active Case Detection and the Elimination of Visceral Leishmaniasis in the Indian Subcontinent through house- to- house visit. VL cases are greatly used for planning and evaluating the efficacy of actions and assessing the intensity and timescale necessary to achieve the elimination target by mathematical transmission model. The model predictions indicated that the current WHO guidelines may be sufficient enough to achieve the elimination target in areas that had medium VL endemicities (up to 5 VL cases per 10000 population per year) before to the start of actions.

Depending upon the contributing factors it is seen that economic condition plays an important role in developing kala-azar cases. That's why Martinez PF et. Al [16] conducted a study on Low castes people are not interested in treatment of visceral leishmaniasis in Bihar, India. Bihar, the poorest state in India, gathering most of the visceral leishmaniasis (VL) cases in the country. A big proportion of the poor rural section where VL endemic cases are marginalized by their socio-economic status, intrinsically attached to the caste system. In

this study, they assessed whether people from low socio-economic strata had facing problems to get VL treatment in Bihar. The result revealed that after adjusting for age, gender and distance to VL treatment facility, Mushars had twice the odds to be 'late presenters' compared to the rest of castes (OR 2.05, 95% CI: 1.24-2.38). Clients who had VL symptoms for ≥8 weeks had a larger spleen and lower hemoglobin level than those who were treated earlier.

Currently about 80% of all kala-azar cases announce each year become visible to have come from villages known historically to have reported any case. During the period of 2013- 2019, only19% of the cases were appear from new villages.

Leishmaniasis are a group of protozoal diseases caused by parasites of the genus Leishmania, and transmitted to man by the bite of female phlebotomine sandfly. They are responsible for various syndromes in human's kala-azar or Visceral leishmaniasis (VL), cutaneous leishmaniasis (CL), muco-cutaneous leishmaniasis (MCL), anthroponotic cutaneous leishmaniasis (ACL), zoonotic cutaneous leishmaniasis (ZCL), post-kala-azar dermal leishmaniasis (PKDL), etc. [17].

In India Kala-azar is an endemic disease still now. The risk factors analogous with kala-azar are poor socioeconomic conditions, malnutrition and high population migration. Nonzoonotic infections of Kala-azar are seen in India mostly [18].

Need of the study: Kala-azar is endemic in 54 districts in Bihar, Jharkhand, West Bengal and Uttar Pradesh. The risk of the disease seen in 130 million of people. While both cutaneous (ZCL and ACL) and visceral (VL) disease has occurred in India, kala-azar is by far the most important leishmaniasis in India. Kala-azar has been declared as notifiable disease in Bihar and West Bengal [19] .

The strategies for Kala-azar elimination are (a) Enhanced case detection and complete treatment including introduction of rK39 rapid diagnostic kits and oral drug miltefosine for treatment of Kala-azar case;(b) interruption of transmission through vector control. It has been pronounced to replace DDT with synthetic pyrethroid for the purpose off going to abolish sandfly, as the insect is become opposition to DDT; (c) Communication for behavioral impart and intersectoral convergence; (d) Capacity building;(e) monitoring, supervision and evaluation: and (f) Research guidelines on prevention and control of Kala-azar have been expanded and circulated to the states.

So, considering the disease burden, the researcher wants to study about kala-azar. The need of the study is to identify the prevalence of kala-azar & it's contributing factors by intensified efforts towards creating public awareness, collaboration improvement, house to house survey by ASHA, referral of symptomatic cases to hospital, improving attendance at fever clinic, use of Rapid Diagnostic Kit, adherence of treatment, Indoor Residual Spray(IRS), Behavior Change Communication (BCC), recording & and reporting, intensified surveillance, continuous follow up and strong monitoring Therefore, the investigator felt the need to study on prevalence of kala-azar & it's contributing factors among rural population by identifying environmental factors, economic factors, socio-cultural factors and utilization of services.

Problem statement: Prevalence of Kala-azar and it's contributing factors among rural population in selected community of West Bengal.

Objectives

i. To assess the prevalence of kala-azar among the rural population.

ii. To identify the contributing factors of kala-azar among the rural population.

iii. To find out the association between contributing factors and selected socio - demographic variables.

MATERIALS AND METHODS:

Research approach

Research approach indicated the basic procedure of conducting research. The

choice of an appropriate methods depends on the objectives of the study. As the main objectives of the study is to identify the contributing factors of Kala-azar among the rural population from 2017-2021, so quantitative approach is selected.

Research design

Descriptive retrospective.

Setting of the study

- **Pilot study**: Pilot study had been conducted,10 Kala-azar client from Villages under Rashidpur Rural Hospital of Dakshin Dinajpur were included in the pilot study.
- **Main study:** Final study had been conducted on 90 Kala-azar clients from Villages under Kushmondi Rural Hospital and villages under Harirampur Rural Hospital of Dakshin Dinajpur.

Population

Kala-azar client in the rural area.

Sample

Kala-azar client of villages under Kushmondi Rural Hospital and Harirampur Rural Hospital under Dakshin Dinajpur.

Sampling technique

In this study, non-probability purposive sampling technique is adopted.

Sample size:

- For final study sample size is 90.
  Sample size was calculated by total enumeration method, after reviewing the Block Kala-azar Master Register at Kushmondi and Harirampur Rural Hospital. Total Kala-azar cases were 108. Among 108 Kala-azar cases only 90 samples were fulfilling the inclusion criteria. (Total 6 cases were child; and 12 cases were migrant). The investigator would collect data from the 90 samples. On a daily basis 3 to 4 samples were collected.

Inclusion criteria

- Kala-azar patient (Visceral Leishmaniasis and Post Kala-azar Dermal Leishmaniasis) who completed treatment within last five years (2017-2021)
- Participants who are willing to participate in the study.
- Can understand Bengali.

Exclusion criteria

- The children under 10 years who have kala-azar.
- Those who are not present in the house at the time of data collection.

Description of tool

Part 1: Semi- structured interview schedule for Demographic and general information

Planning of first draft for Semi- structured interview schedule for collection of demographic and general information from the Kala-azar patients. There were eleven items.

Those were:

- Age.
- Gender.
- Religion.
- Caste.
- Education.
- Occupational status.
- Monthly family income.
- Marital status.
- Total family members.
- Numbers of members suffered from Kala-azar.
- Types of houses.

Part 2: Record analysis format for identifying Prevalence of Kala-azar and disease profile.

There are five areas in the record analysis format.

Areas were:

- Village code.
- Total population.
- Year of diagnosis.
- Diagnosis method.

- Type of Kala-azar

Part 3A: Observational checklist on environmental factors of Kala-azar.

There were 20 items based on the environment like

- Neatness and cleanliness of rooms.
- Ventilation.
- Presence of bushes, bamboo tree, vegetation or paddy field, stagnant water, crack on the floor/wall, granary and cattle shed.
- Dumping pit.
- Uncovered drainage system.

Part 3B: Structured interview schedule on other contributing factors of Kala-azar

Data regarding contributing factors were collected by this tool.

There were 3 areas and 25 items.

Areas:

- Economic factors.
- Socio-cultural factors.
- Utilization of services.

Statistical methods:

Descriptive statistics

- Frequency and percentage distribution were computed for describing the sample demographics.
- Frequency and percentage distribution were computed for describing the prevalence of Kala-azar.
- Frequency and percentage distribution were computed for describing the contributing factors.

Inferential statistics

- Association between selected demographic variables and contributing factors of Kala-azar by Chi- square test.
- Domain wise contributing factors of Kala-azar among the rural population by ANOVA test.
- Correlation matrix among domains of contributing factors were performed by Pearson Correlation.

Results: The majority of the Kala-azar patients (37%) were in the age group of 30 - 49 years and 34% belonged to 50 and above and 29% are in 10 - 29 years of age. Data depict that 51% were male and 49% are female. Data present that most (96%) of the Kala-azar patients were Hindu, 3% were Christian and only 1% are Muslim.

Data revealed that a majority (89%) of the subjects were schedule tribe, 10% were schedule caste and only 1% were general category.

Data also depict that a majority (56%) of the subjects were illiterate, 31% subjects completed primary education where as 13% had secondary education. The data depicted that near half (54%) of the Kala-azar patients were in labor, compared with just 18% were, 16% and 12% were farmer, home maker and unemployed.

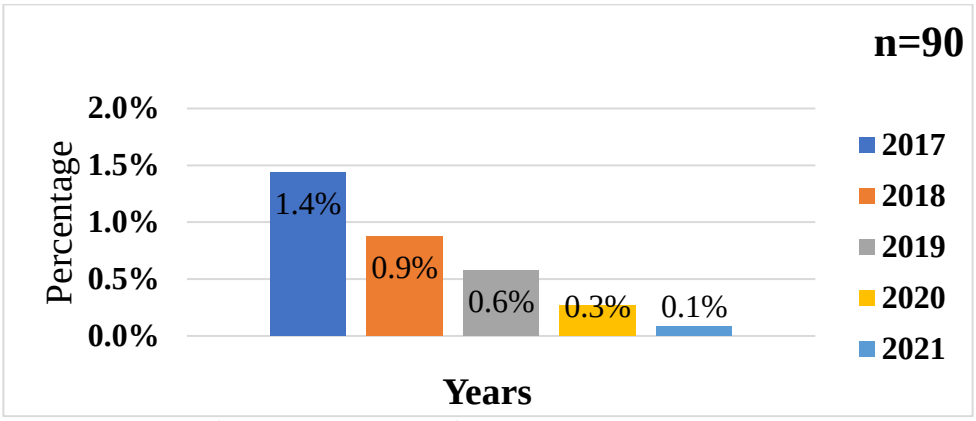
Data in this figure also reveal that the majority (89%) of sample had monthly family incomes less than 5000 per month and only 11% sample had monthly incomes between 5001-10000.

The data present that a majority (57%) subjects were married, 22% were single, 19% were widow while 2% were separated.

It also reveals that a majority (71%) of the Kala-azar patients had more than 5 family members and only 29% had less than 5 family members.

It shows that a majority (92%) of the number of <2 members suffered from Kala-azar rather than >2 members had Kala-azar 8%.

The data depicts that most (62%) of the Kala-azar patients had Kancha house, whereas only 38% had mixed house.



***Kala-azar cases are taken from the master register of Kushmondi Rural hospital and Harirampur Rural Hospital.**
Figure 1 bar diagram showing prevalence of Kala-azar according to year wise.

Figure 1 reveals that the highest (1.4%) prevalence of Kala-azar had been seen in the year 2017, 0.9% had been seen in the year 2018, 0.6% seen in the year 2019, 0.3% had been seen in the year 2020 and lowest 0.1% prevalence of Kala-azar had been seen in the year 2021.

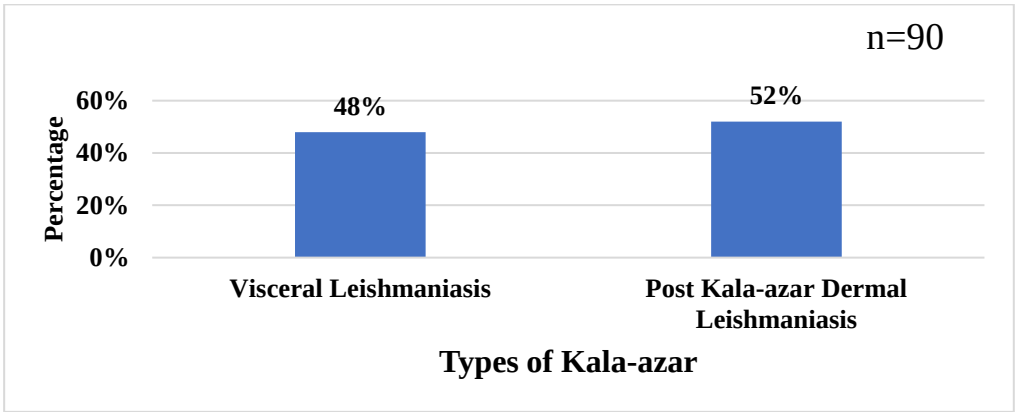


Figure 2 bar diagram showing frequency percentage distribution of types of Kala-azar

Figure 2 depicts that a majority (52%) of the patients had Post Kala-azar Dermal Leishmaniasis (PKDL) while 48% had Visceral Leishmaniasis (VL).

Finding related to environmental factors:

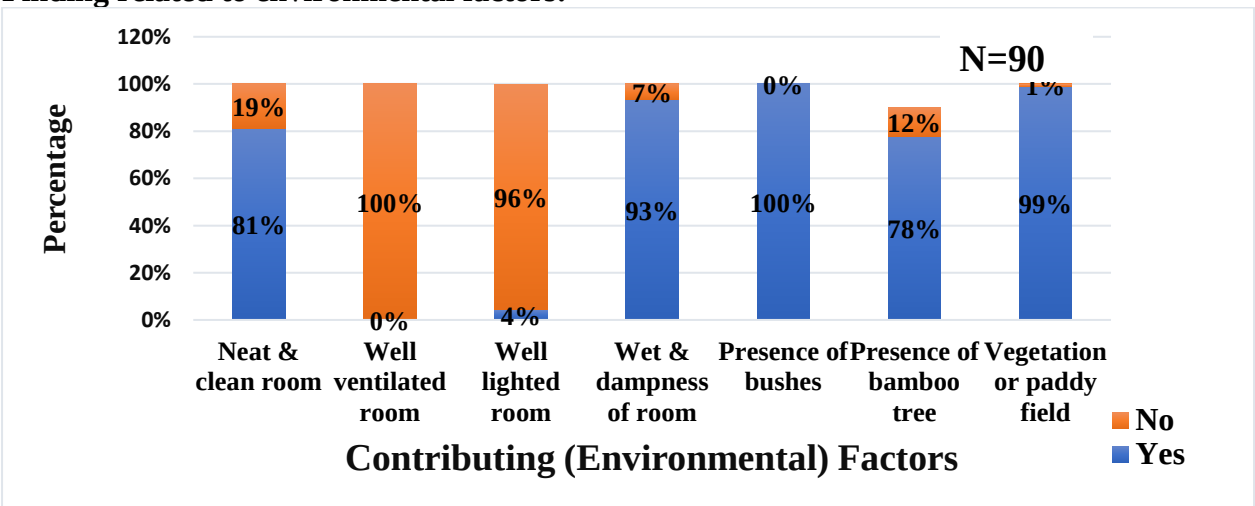


Figure 3A Bar diagram showing percentage distribution of contributing factors (environmental factors) among Kala-azar patient.

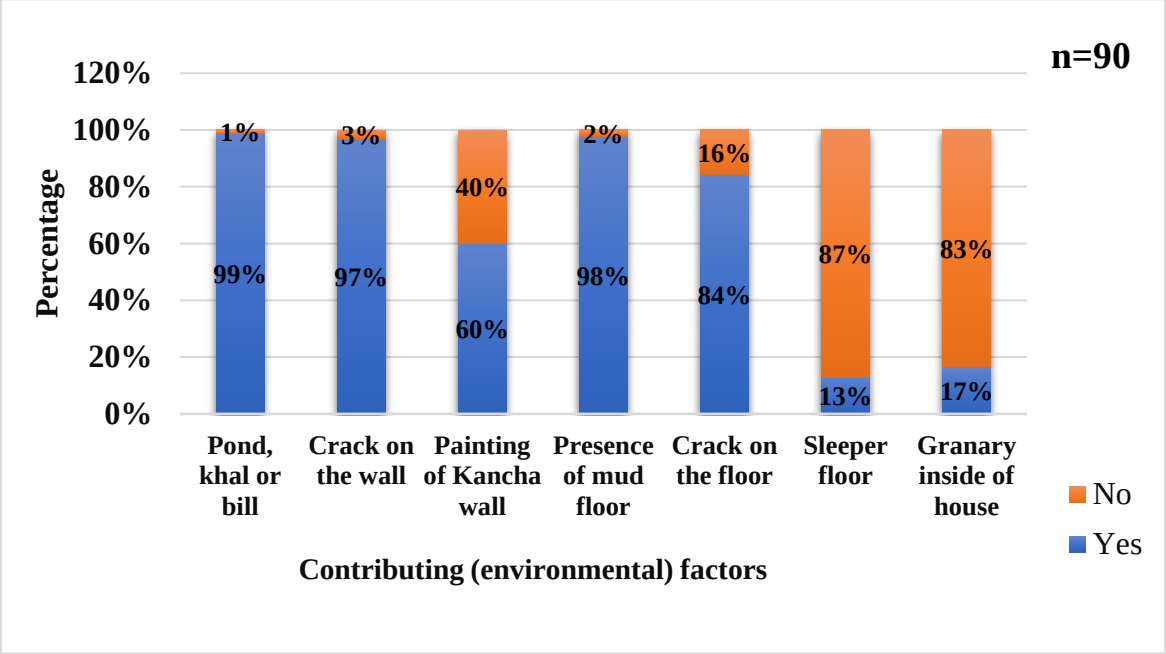


Figure 3B Bar diagram showing percentage distribution of contributing factors (environmental factors) among Kala-azar patient.

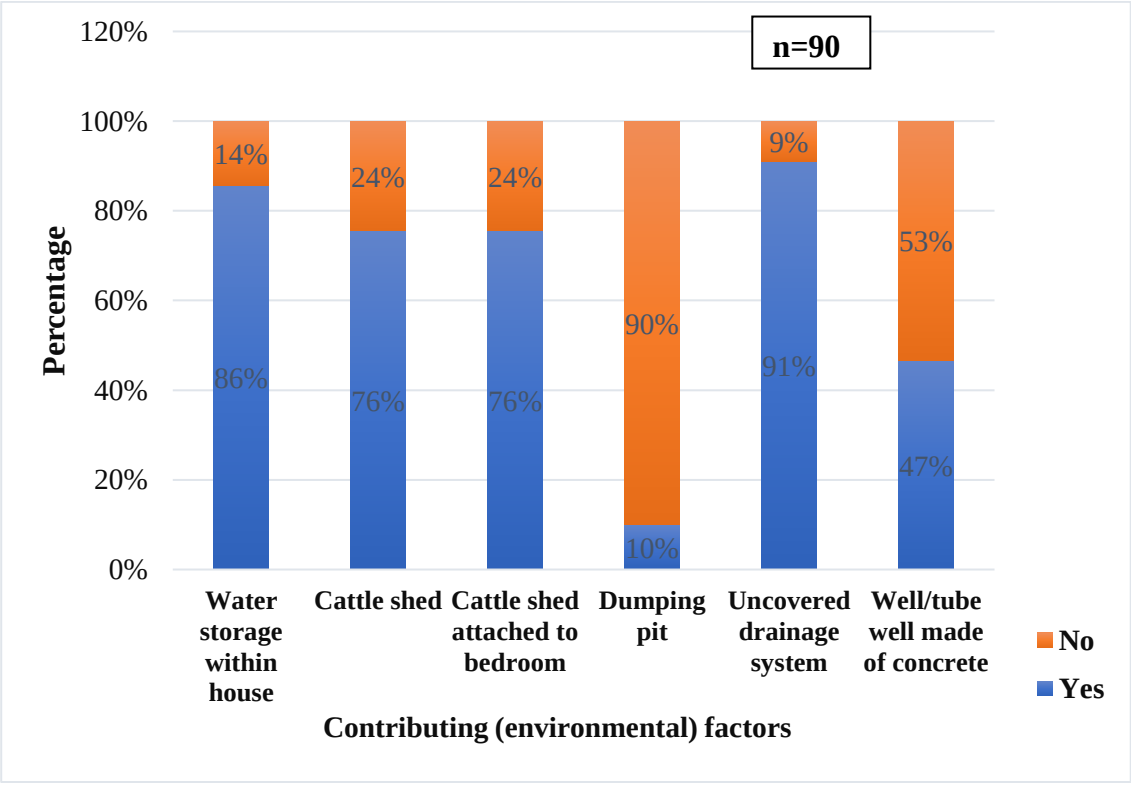


Figure 3C Bar diagram showing percentage distribution of contributing factors (environmental factors) among Kala-azar patient.

Figure 3A depicts that maximum (81%) rooms were neat and clean whereas, 19% rooms were not neat and clean but maximum (93%) rooms of Kala-azar patients were wet and damp and only7% rooms were not wet and damp. It also revealed that 100% rooms were not well ventilated and maximum (96%) rooms were not well lighted whereas, only 4% rooms were well lighted. The presence of bushes around houses was 100%. It also reveals that the majority of (99%,) Kala-azar patients had vegetation or paddy fields and among them 78% had bamboo trees around their houses. The figure also reveals that 12% had no bamboo trees and

1% had no vegetation or paddy fields around their house.

Figure 3B depicts that the majority 99% Kala-azar patients had pond, khal or, bill around their house. Majority 97% houses had crack on the wall. They painted their kancha wall with mud wall at regular intervals of 60%. It also shows that 1% had no pond, khal, bill or stagnant water around the houses, only 3% houses had no cracks on their wall and 40% Kala-azar patients had not painted their kancha wall with mud at regular intervals.

The figure depicts that maximum (98%) houses had mud floor; 84% houses had cracks on the floor but only 2% houses had no mud floor and 16% houses had no cracks on the wall. The figure also revealed that maximum (87%) houses had no sleeper floor whereas, only 13% houses had a slippery floor. It also shows that maximum (83%) houses had no granary inside the house whereas only 17% houses had granary inside their houses.

Figure 3C depicts that a majority 86% houses had the presence of water storage within the house and 14% houses had not any water storage within the house. It shows that maximum (76%) houses had cattle sheds within which all were attached with bedroom. 91% houses had uncovered drainage systems around house, only 10% houses had dump pit and only 47% nearby wells or tube wells made of concrete.

The figure also reveals that maximum 90% houses had no dump pit, 53% nearby well or tube well had not made of concrete, 24% houses had no cattle sheds and only 9% houses had no uncovered drainage system.

Finding related to other contributing factors: Data shows that maximum (96%) patients get benefited from BPL or ANTODYAY card and only 4% did not get benefit from BPL or ANOTODYAY card, most (64%) were gone outside (other Kala-azar endemic state or district) for work and 36% were not going outside for their work. The other earning members in the family were 73% and 27% had no other earning member of the family.

It is also depicted that the maximum (94%) had no fixed amount of income whereas, only 6% had fixed amount of income. The maximum (91%) income was not sufficient to meet the family expenses; only 9% Kala-azar patients can meet family expenses.

Data shows that 72% patients were sleeping at night outside the room or veranda but 28% Kala-azar patients were not sleeping at night outside the room or veranda. However, 69% patients did not use cot for sleeping only 31% used a cot for sleeping. A maximum (70%) of Kala-azar patients slept with bare bodies whereas only 30% of Kala-azar patient were not sleeping with bare body.

It also depicts that 58% Kala-azar patients were using mosquito nets during sleeping and 42% were not using mosquito nets during sleeping. Maximum (81%) Kala-azar patients were taking home made substance or haria whereas only 19% were not taking home made substance or haria.

Data presented in table 11 reveal that ASHA visited houses at regular intervals 100%, ASHA conducted awareness meeting regarding Kala-azar 100%, She referred the patient to SC/ hospital any if they had any fever 99% and 1% patient referred by ASHA and 100% patient attend hospital.

It also shows that ASHA accompanied maximum (89%) patient to go for hospital whereas only 1% had not accompanied by ASHA.

The data reveals that maximum (96%) patients had no problem to get treatment only 4% patient faced problem to get treatment. Maximum (98%) patients visited by HA (F)/ CHA during their treatment and only 2% had not visited by HA (F)/ CHA during their treatment.

It is also depicted that ASHA had given information regarding Indoor Residual Spray (IRS) 99% Kala-azar patients and only 1% patients had not given information by ASHA. ASHA had given leaflet regarding Indoor Residual Spray (IRS) 100% and maximum (100%) patients were allowed their bedroom for giving Indoor Residual Spray (IRS).

Data reveals that a maximum (96%) of patients were taking Indoor Residual Spray (IRS) in the kitchen room and only 4% were not taking Indoor Residual Spray (IRS) in the kitchen room. Most (81%) of the patients were taking Indoor Residual Spray (IRS) whose cattle is present and 19% were not taking Indoor Residual Spray (IRS) in spite of cattle shedding being present. Maximum (93%) patients were removing all the thing (wall clock, calendar & painting) that are stick on the wall and only 7% patients were not removing all the things from the wall.
The data also depicts that 100% of the Kala-azar patient did not paint their wall immediately after Indoor Residual Spray (IRS). 100% of the Kala-azar patient did not receive Insecticide Treated -Bed-Net (ITBN).

Finding related to the domain wise contributing factors of Kala-azar.

Table 1 domain wise contributing factors of kala-azar among rural population. n=90

Contributing factors	Mean	Standard deviation	ANOVA test F Value	P value
Environmental factors	13	1.48		
Economic factors	2.48	0.82	2507.18	<0.001
Socio- cultural factors	2.06	1.21		
Utilization of services factors	11.59	0.71		

Table value of F with (3,356) df = 2.60, p<0.05 → significance

Data presented in the1table depicted that there were statistically significant mean differences among the contributing factors as the ANOVA TEST calculated F-value (2507.18) is higher than table value of F (2.60) with df (3, 356) at 0.05 level of significance. Environmental factors contributed more than other factors as the mean value (13.00) was more than other factors.

Finding related to the correlation matrix among domains of contributing factors of Kala-azar:

Table 2 correlation matrix among domains of contributing factors of Kala-azar among rural population. n =90

Domains of contributing factors	Co- relation	Environmental factors	Economic factors	Socio-cultural factors	Utilization of services
Environmental factors	Pearson co-relation	1	0.129	0.094	0.296*
	P value		0.227	0.380	0.005
Economic factors	Pearson co-relation		1	0.243*	0.298*
	P value			0.021	0.004
Socio-cultural factors	Pearson co-relation			1	0.298*
	P value				0.004
Utilization of services	Pearson co-relation				1
	P value				

Data presented in table 2 depicts that there was a statistically significant relation between environmental factors with the utilization of services; economic factors with socio- cultural factors and utilization of services; socio- cultural factors with utilization of services as the p-value is <0.05, at 0.05 level of significance.

Finding related with association between selected demographic variables with contributing factors.

Table 3 association of demographic variables with contributing factors. n =90

Variables	Contributing factors		Chi square	df	Significance
	<median (29)	≥ median (29)			
Age					
10-29 years	8	18			
30-49 years	9	24	**7.391***	2	Significant
50 and above	18	13			
Gender					
Male	23	23			
Female	12	32	**4.888***	1	Significant

χ^2 (df)2=5.99 p <0.05, χ^2 (df)1=3.84 p <0.05

Data presented in table 3 depicted that there was a statistically significant association between contributing factors and selected demographic variables like age, gender as the calculated value of chi square is higher than table value of chi square at 0.05 level of significance.

DISCUSSION

Discussion of the present study in relation to other studies

In the present discussion, the major findings of the study have been discussed with the reference to the results obtained by the other researchers.

Discussion related to the prevalence of Kala-azar

Present study shows the prevalence of kala-azar is decreasing in nature but it is emerging in new villages. Present study finding revealed that in the year 2017, the prevalence of Kala-azar was 1.4%, in the year 2018 the prevalence of Kala-azar was 0.9%, in the year 2019, the prevalence of Kala-azar was 0.6%, in the year 2020, the prevalence of Kala-azar was 0.3% and in the year 2021, the prevalence of Kala-azar was 0.1%. The Kala-azar cases in the year 2017 was 35, in the year 2018 was 14, in the year 2019 was 16, in the year 2020 was 14 and in the year 2021 was 11.

National Vector Borne Disease Control Programme by WHO revealed that Kala-azar cases in the year 2017 were 166, in the year 2018 were 87, in the year 2019 were 51, in the year 2020 were 39 and in the year 2021 up to April were one in West Bengal. In the India Scenario it is also decreasing in nature. Kala-azar cases in the year 2017 were 1982, in the year 2018 were 1245, in the year 2019 were 821, in the year 2020 were 617 and in the year 2021 up to April 248.

Discussion related to the contributing factors of Kala-azar

In this present discussion, the major findings of the study have been discussed with the reference to the results obtained by the other researchers.

Discussion related to contributing factors Kala-azar

Present study findings revealed that environmental factors contributed more than other factors as the mean value (13.00) is more than other factors which includes majority (86%) of Kala-azar patients having water storage within their house, majority (93%) of the Kala-azar patients are wet and damp, majority (93%) of the Kala-azar patients had a mud floor and 97% have cracks in the wall and (89%) of the Kala-azar patients are in low socio-economic groups. Depending on the risk factors Oryan A and Akbari M [20] conducted a study on risk factors in the world. The study revealed that leishmaniasis has emerged or re-emerged in many geographical areas and it generated problems in global health and economic concerns that involving humans, domestic animals and wild life. The ecology and epidemiology of leishmaniasis are overwhelmed by the host, reservoir and vector (human, animal and sandfly) and the environment. The spread of leishmaniasis incorporated environmental factors such as alterations in temperature and water storage, irrigation habits, deforestation, climate changes immunosuppression by HIV or organ transplant, development of drug resistance, get larger travel to endemic regions and dog importation. War, poor socio-economic status and low- level households are also major contributors to the spread of this disease.

Present study finding revealed that maximum (92%) Kala-azar patient had less than two family members suffered from Kala-azar, majority (62%) Kala-azar patient had Kancha house, 17% patient had granary inside the house, majority (78%) patient had bamboo trees around their house and only (19%) houses were not sprayed with Indoor Residual Spray.

Ranjan A. et al[21] conducted a case control study, to understand the risk factors associated with Kala-azar in disease endemic areas of Bihar. Multivariate analysis showed that a history of other diseases in the previous year (odds ratio [OR] 3.6, P 0.002), a history

of kala-azar in the family (OR 1.8, P 0.03), mud-plastered walls in houses, (OR 2.4, P 0.0001], a granary inside houses (OR 4.3, P 0.0001), presence of bamboo trees around houses (OR 2.3, P 0.001), and houses unsprayed with DDT in the past six months (OR 3.4, P 0.0001) were significant risk factors for kala-azar.

Present study finding revealed that majority (78%) of Kala-azar patient having kancha house, maximum (99%) houses of Kala-azar patients are damp and wet, majority (99%) patients having vegetation or paddy field around the house. A similar study by Bern C, Courtenay O, Alvar J [22] in of cattle, sand flies and men: a systematic review of risk factor analyses for South Asian visceral leishmaniasis and its implication showed that Mud walls, palpable dampness in houses, and peri-domestic vegetation may increase infection risk through enhanced density and prolonged survival of the sand fly vector.

Present study finding revealed that a majority (69%) number of Kala-azar patient were not using cot for sleeping, 42% patient is not using mosquito net during sleeping and a majority (76%) Kala-azar patients had cattle shed. Visceral leishmaniasis (VL) has reemerged as a major public health problem in lowland Nepal since 1980. Considering this problem, Bern C [23] conducted a study to identify the factors responsible for visceral leishmaniasis in Nepal. The study results showed through univariate analyses among 84 cases and 105 controls, protective factors comprise sleeping on a bed or cot (Odds ratio [OR] 0.44, P < 0.01) and using bed-net regularly during sleeping (OR 0.23, P < 0.001) or in the warm months (OR 0.20, P < 0.001). The bed-nets in use in this region were industrially available and untreated with insecticide. The ownership of a cow or buffalo was protective (OR 0.34, P < 0.001), whereas the dampness noticed in the mud floor of the house was a strong risk factor (OR 4.0, P < 0.001). In multivariable models, bed-net usage, cow or buffalo ownership, and damp floors were significantly connected with altered risk.

Limitations:

- Data was collected through respondents based on their verbal communication and available records which may not be adequately correct in all cases.
- The study was confined to a particular rural area of study, does not adequately represent all population.
- The study was limited to the recall of respondents of Kala-azar patient.

Recommendations for further study

- In conclusions, the researcher strongly belief that rural communities to be empowered economically.
- They must be made aware of consequences of getting the infection.
- Public health problems should be introduced in the school also.
- The Government should enforce proper implementation of National Health Programme.
- An exploratory study can be conducted to identify other contributing factors.
- A comparative study with same variables can be conducted between tribal and general population.
- A case control study can be conducted to find out the most prominent factors of Kala-azar.
- A longitudinal study can be done to find out the effects of Kala-azar.

CONCLUSION

The present study findings revealed that the trends of prevalence of Kala-azar are decreasing in nature. Present study findings revealed that environmental factors contributed more than other factors as the mean value is more than other factors like economic, socio-cultural and utilization of services. Environmental factors which include rooms are not well-ventilated; are not well-lighted; the presence of bushes vegetation field stagnant water and bamboo trees around the house; presence of mud floor; wet and damp rooms; cracks in the wall; granary inside the house; presence of cattle shed and uncovered drainage system

around the house. In the other hand, utilization of services is good like home visit by ASHA at regular intervals and conduction of awareness meeting; early detection of fever cases and ASHA accompany client to go to hospital; HA(F)/C.H. A visit client during their treatment. Beside the involvement of community people in taking I.R.S in the bedroom; in the kitchen room and taking I.R.S in the cattle shed.

Declaration by Authors

Ethical Approval: Approved
Acknowledgement: Mr. Bimal Sarkar (husband).
Source of Funding: None
Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. World Health Organization. Vector Borne Diseases. 2020 available from – https//www.who.int.
2. Al-Salem W, Herricks RJ, Hotez JP. A review of visceral leishmaniasis during the conflict in South Sudan and the consequences for East African countries. BMC. 2016;9(1): Available at parasiteandvectors.biomedcentral.com.
3. Alvar J, Yactayo S, Bern C. Leishmaniasis and poverty. *Trends in Parasitology*, 2006;22(12): 552-557. Available at https://scholar.google.com.
4. Postigo RAJ. Leishmaniasis in the world health organization eastern Mediterranean region. *International Journal of Antimicrobial Agents*, 2010;36(1): S62-S65. Available at: Publisher Site | Google Scholar
5. W. H. Organization. Working to overcome the global impact of neglected tropical diseases: first WHO report on neglected tropical diseases. 2012 January 30th; Available at reliefweb.int/report/world.com.
6. Pigott DM, Golding N, Messina JP et al. Global database of leishmaniasis occurrence locations, 1960-2012, *Scientific Data*, 2014 September 30th;1.View at: Publisher Site | Google Scholar
7. Chappuis F, Sundar S, Hailu A. Visceral leishmaniasis: what are the needs for diagnosis, treatment and control? *Nature Reviews Microbiology*, 2007;5(11): 873-882.View at: Publisher Site | Google Scholar
8. W.H.O. World Health Organization. Leishmansis, available at http://www.who.int/leishmaniasis/burden/en/.
9. B. Thimphu. Review of The Decisions and Resolutions of The Sixtieth World Health Assembly and the 120Th and 121St Sessions of The Executive Board. Institutional Respiratory for Information Sharing. Available at who.int/iris.com.
10. Alvar J, Vélez DI, Bern C et al. Leishmaniasis worldwide and global estimates of its incidence. *PLOS ONE*. 2012 May 31st; 7(5). Available at journals.plos.org.com.
11. Guerin JP, Olliaro P, Sundar S et al. Visceral leishmaniasis: current status of control, diagnosis, and treatment, and a proposed research and development agenda. National Library of Medicine. 2002 August; 2(8): 494-501. Available at pubmed.ncbi.nlm.nih.gov.
12. Ostyn B, Vanlerberghe V, Picado A et al. Vector control by insecticide-treated nets in the fight against visceral leishmaniasis in the Indian subcontinent, what is the evidence? National Library of Medicine. 2008 August;13(8): 1073-1085. Available at pubmed.ncbi.nlm.nih.gov.
13. Picado A, Singh PS, Rijal S et al. Long-lasting insecticidal nets for prevention of Leishmania donovani infection in India and Nepal: paired cluster randomized trial. National library of Medicine. 2010 December 29;341: c6760. Available at pubmed.ncbi.nlm.nih.gov.
14. Chapman CAL, Morgan K, Adamas RE, Bern C et al. Age trends asymptomatic and symptomatic Leishmania donovani infection in the Indian subcontinent: A review and analysis of data from diagnostic and epidemiological studies. Plos Neglected Tropical Diseases. Available at journals.plos.org/plosntds.
15. Rutte Le AE, Chapman CAL, Coffeng EL et al. Policy recommendations from transmission Modeling for the Elimination of Visceral Leishmaniasis in the Indian subcontinent. National Library of Medicine. 2018 June 15;66(suppl 4): S301-S308. Available at pubmed.ncbi.nlm.nib.gov.
16. Martinez PF, Picado A, Roddy P, Palma P. Low castes have poor access to visceral leishmaniasis treatment in Bihar, India. National Library of Medicine. 2012 May;

17(5): 666-73. Available at pubmed.ncbi.nlm.nib.gov.
17. Park K. A text of Preventive and Social Medicine. 25th edition. Jabalpur: M/S Banarsidas Bhanot. 2019. 348-352 & 472-474.
18. Govt. of India, Accelerated plan for the Kala-azar elimination 2017, Directorate of NVBDCP.
19. Govt. Of India, Annual Report 2015-2016, Ministry of Health and Family Welfare, New Delhi.
20. Oryan A, Akbari M. a study on worldwide risk factors in Leishmaniasis. National Library of Medicine. 2016 October;9(10):925-935. Available at https://pubmed.ncbi.nlm.nih.gov.
21. Ranjan A , Sur D, Singh PV et al. Risk factors for Indian kala-azar. National Library of Medicine. 2005July;73(1);74-8. Available at https://pubmed.ncbi.nlm.nih.gov.
22. Bern C, Courtenay O, Alvar J. Of cattle, sand flies and men: a systematic review of risk factor analyses for South Asian visceral leishmaniasis and implication. 2010 February 9th;4(2): e599. Available at https://pubmed.ncbi.nlm.nih.gov.
23. Bern C. Factors associated with visceral leishmaniasis in Nepal: bed-net use is strongly protective**.** National Library of Medicine. 2010 February 9th;4(2): e599. Available at https://pubmed.ncbi.nlm.nih.gov.

How to cite this article: Pampa Sarkar, Aparna Ray, Jaya Mandal. Prevalence of kala-azar and its contributing factors among rural population in selected community of West Bengal. *International Journal of Science & Healthcare Research.* 2024; 9(1): 319-331. DOI: *https://doi.org/10.52403/ijshr.20240143*

******