A Cross-Sectional Study on Health Literacy and its associated factors among Adults of a Rural Area of Hooghly District, West Bengal

ABSTRACT

Background and Objectives: Health literacy (HL) is the degree to which individuals have the ability to access, understand and use health-related information and thus enable them to make health-related decisions. Thus accessing health-related information, understanding the available information and using those in their daily life determines HL of the individual. Addressing problematic health literacy can help to reduce health inequities in the community. Knowing the adequacy of HL is preliminary step towards it. The study aims to assess the HL status and its associated factors.

Materials and Methods: A community-based cross-sectional study was conducted to assess HL among adults aged 18 to 64 years residing in the rural area of Singur using the tool HLS-EU-Q47 from October 2020 to November 2022. Two-stage random sampling was done among 15 selected villages under the field practice area. Data was analyzed using Microsoft Excel & IBM SPSS v. 16.

Results: The median age of the study participants was 40(29.0 - 49.0) years. Adequate HL was found in 11.7% of the participants and 88.3% had problematic/inadequate HL. HL was found to be significantly associated, at 95% confidence interval, with the age of the study participants, years of schooling, employment status, being decision-makers of the family, and presence of healthcare workers in the family. HL was found to be adequate in the healthcare domain and inadequate in other domains.

Conclusion: HL was found to be problematic/inadequate in majority of the study participants. Strategies to strengthen health literacy should be adopted with more emphasis on younger adults. Health-promoting schools are one of the initial steps to achieve the same. Healthcare professionals should disseminate health promotion interventions among the general population to improve the HL of the community.

Paper Type: Research Article

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Introduction

WHO defined health literacy (HL) as "The cognitive and social skills which determine the motivation and ability of individuals to gain access to understand and use information in ways which promote and maintain good health" (1). The four key cognitive domains of HL includes accessing health information, which involves the ability to locate and obtain relevant health information from various sources, including healthcare providers, the internet, and community resources; understanding health information, which means to comprehend the information they access, including interpreting medical jargon, understanding health instructions, and grasping the implications of health data; appraising health information which refers to the ability to critically evaluate the quality and relevance of health information, in discerning credible sources from misinformation and understanding the context of health messages; and applying health information which involves making informed health decisions and engaging in health-promoting behaviours, such as adhering to treatment plans or participating in preventive health measures.

The concept of HL evolved in the Nairobi conference as one of the measures to reduce the implementation gap of health promotion strategies (2). Later in the Shanghai declaration, HL was identified as one of the three pillars for achieving sustainable development goals: good governance, healthy cities, and health literacy being three thematic pillars. To empower people and drive equity, they committed to recognize health literacy as a critical determinant of health and thus invest in its development (3). HL promotes individual, family and community health-seeking behaviours, empowers individual citizens to demand rights and quality services, and enables engagement in collective health promotion action.

Socioeconomic factors related to adequate health literacy was studied extensively in developed countries and found literacy as most important factor (4). HL is considered a social determinant of health, which may be open to change through interventions to improve communication or to develop skills in low literate people. Limited HL is more common in socially disadvantaged populations, and researches that have been added to the literature suggest that it can be an explanatory factor that generates health disparities (5). Differences in HL contribute to health inequities and health outcomes. Health disparities are produced and perpetuated by multilevel forces operating at the individual, family, health system, community, and public policy levels that mutually reinforce each other (6). Informed health literacy among decision-makers supports ongoing commitment to health impacts, co-benefits and effective actions on the determinants of health. The interventions through health care literacy and public health literacy pathways, this health inequities can be addressed.

In European countries like Latvia and Lithuania, around one-fourth of the population have adequate HL (7). According to the National Assessment of Adult Literacy, only 12% of Americans have proficient HL skills (8). In developing countries like China, Brazil and Cameroon, less than one-fourth

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population have adequate HL (9, 10) which is similar to the developed nations. The number of community-based studies assessing health literacy levels among the general population, particularly in India, is notably limited. A study done in a hospital setting in Jodhpur found that 65.8% had inadequate HL (11) whereas other studies conducted for screening of HL, found a range of adequate HL from 25 to 50% (12, 13).

An extensive understanding of HL is necessary to explore the needs of the community and provide with accessible and equitable health care services. The research conducted, mostly, were hospital based and were focusing on attributes such as functional health literacy and specifically on maternal HL, Diabetics HL, Dental HL etc. The present study aimed to assess HL holistically, with emphasis on domains of HL, and its association with different sociodemographic factors among individuals in a selected rural population of West Bengal.

Materials and Methods

This community based, cross sectional study was done among adults, during October 2020 to November 2022 in rural area of Singur, Hooghly district which is the field practice area of All India Institute of Hygiene and Public Health covering 64 villages with a population of 99,229 according to 2011 census. All individuals of the age group 18-64 years and residing in the area for atleast one year were included in the study. Those with any diagnosed neurological diseases were excluded from the study as such individuals were dependent on the caregiver for their daily activities. Sample size was calculated using standard Cochran's formula, N = z2PQ / l2, with prevalence of poor health literacy as 28.2% (14) with relative error of 20% and design effect of 1.5, sample size came up to 375 with replacement.

Study participants were selected by two stage random sampling and Probability Proportionate to size method. In first stage, 15 villages were selected and in second stage 25 participants were selected from each village. Both stages were done by simple random sampling. The list of permanent residents of the selected villages were obtained from the voter's list of government website. Random numbers were generated using MS Excel. If any study participant was not available on the day of data collection, other available member of the household was considered for the study by Kish grid method.

HL was assessed by the European HL Survey Questionnaire (HLS-EU-Q 47), which consisted of 47 questions with responses on a Likert scale of 1-4, where 'one' corresponds to very difficult and 'four' very easy. The score obtained was then converted to a total score of 50. HL was assessed in two domains, namely health and cognitive. Health domains such as health care, disease prevention, health promotion were assessed and different cognitive domains like access, understand, appraise, apply were also measured. Number of questions in healthcare domain, disease prevention and health promotion domain were 16, 15 and 16 respectively. It was classified as inadequate HL for an aggregate score of 0-25, problematic HL for 25-33, sufficient HL for 33-42, and excellent HL for 42-50. For each health domain, the scores were calculated ranging from 0-50 using the formula (mean-1)*(50/3). The questionnaire is validated for

other Asian countries (15) and a short form of questionnaire is validated in India also (16).

The data were entered in Microsoft Excel and were later exported to Statistical Packages for Social Sciences (SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. SPSS Inc., Chicago, IL). Statistical analysis was done and the descriptive results were represented in different tables using number and percentage. Normality of the variables were assessed using Kolmogrov Smirnov tests; considering a p-value of >0.05 was considered to be normally distributed. As health literacy score was not normally distributed, non-parametric tests were used for analysis. Statistical analysis was done using univariate and multivariable logistic regression to determine the association of various independent variables with HL status and its health domains. Spearman's correlation was determined for the continuous variable like age, education and income. Sociodemographic factors, presence of health care professionals in family, decision makers of family were considered as the independent variables.

Ethical clearance was obtained from the institutional ethics committee (Reference number 12/IEC/2021 dated 18th January 2021).

Results

Sociodemographic characteristics

Table 1 shows the sociodemographic characteristics of the study participants, where the median age was 40 (29-49) years, and 3.5% (n=13) of them were students. Among females 75.5% (n=163) were homemakers, and among males 34.6% (n=55) were agricultural workers. Healthcare workers were present in families of 5.1%

(n=19) participants, where the participant themselves or family member was a healthcare worker.

Health literacy score and its domains

Figure 1 shows the median of health literacy scores and its subdomains among the study participants. Highest score was found in health care domain followed by disease prevention domain which were higher than the median of general health literacy. Inadequate health literacy was found in 61.6% (n=231), problematic health literacy in 26.7% (n=100)), and sufficient health literacy in 11.7% (n=44) of the participants. None of the participants had excellent health literacy. Median and interquartile range of the cognitive domains like access, understand, appraise, and apply were 20.6 (19.8-22.5), 23.9 (22.6-31.9), 20.7 (18.9-22.9) and 20.0 (19.0-21.5) respectively. The median values of the cognitive domains of different health domains like health care, disease prevention, and health promotion are shown in Table 2. Adequate HL was found in 20.6%, 12.2% and 5.8% in healthcare domain, disease prevention domain and health promotion domain respectively.

Factors associated with health literacy

A significant and weak correlation was found among health care HL with education (Spearmans rho=0.123) and Per Capita Income (Spearmans rho= 0.151) of the study participants. A significant and weak correlation was present between Health promotion domain of Health literacy and education (Spearmans rho=0.115) of the study participants.

Table 3 shows logistic regression for the factors associated with adequate health literacy.

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Table 1. Sociodemographic characteristics of the study participants (n=375)

Variables	Categories	Number (%)
Age	< 20	11(2.9)
	20-29	87(23.2)
	30-39	85(22.7)
	40-49	101(26.9)
	50-59	61(16.3)
	≥ 60	30(8.0)
Gender	Male	159(42.4)
	Female	216(57.6)
Religion	Hindu	357(95.2)
	Muslim	18(4.8)
Marital status	Married	332(88.5)
	Unmarried	18(4.8)
	Separated	25(6.7)
Educational status	Non formal education	27(7.2)
	Below primary (1,2,3,4)	13(3.5)
	Primary (5,6,7)	113(30.1)
	Middle (8,9)	56(14.9)
	Secondary (10,11)	101(26.9)
	Higher secondary (12 pass)	34(9.2)
	Graduate	26(6.9)
	Postgraduate	5(1.3)
Employment status	Gainful employment	183(48.8)
	Not in gainful employment	192(51.2)
Socioeconomic status (Modified BG Prasad classification 2021)	Class I (7533 and above)	3(0.8)
	Class II (3766-7532)	38(10.1)
	Class III (2260-3765)	106(28.3)
	Class IV (1130-2259)	179(47.7)
	Class V (1129 and below)	49(13.1)
Involvement in decision making	Decision makers	149(39.7)
	Not decision makers	226(60.3)

Table 2. Descriptive statistics of cognitive domains of different health domains

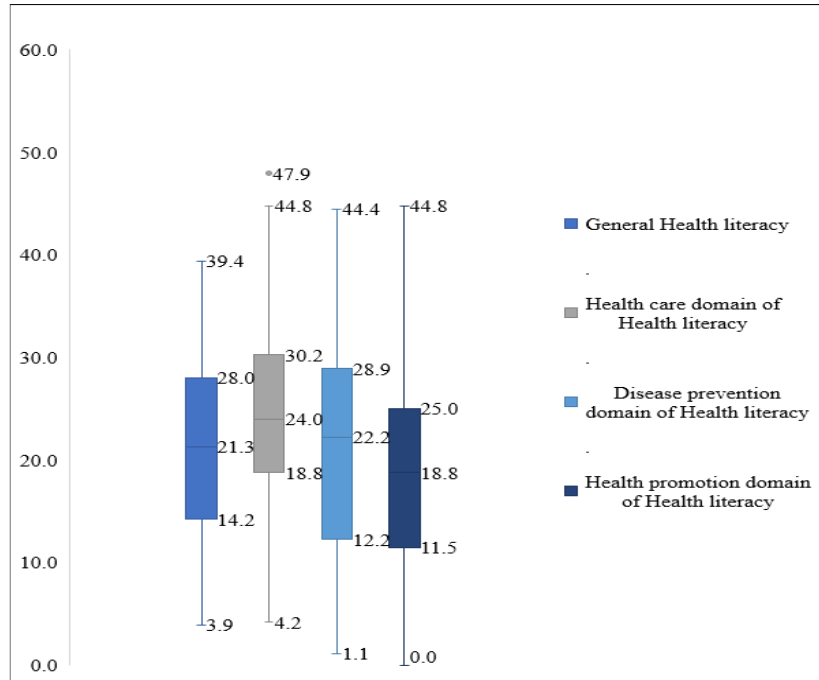| Health domains	Cognitive domains	Median	IQR (25-75)
Health care domain	Access	25.0	16.6-33.3
	Understand	25.0	20.8-33.3
	Appraise	20.8	8.3-29.2
	Apply	29.2	20.8-33.3
Disease prevention domain	Access	29.2	12.5-29.2
	Understand	20.8	12.5-33.3
	Appraise	20.8	12.5-33.3
	Apply	22.2	11.1-27.7
Health promotion domain	Access	16.7	10.0-23.3
	Understand	25.0	16.7-29.2
	Appraise	22.2	5.5-33.3
	Apply	12.5	4.2-20.8

Figure 1. Box and whisker plot showing health literacy score in different domains (n=375)

Fig 2 shows the difference in median scores of HL and its different health domains among males and females. It was found that highest median score was present for males in all the domains compared to females and the highest score was found in health care health literacy domain. The difference was found to be statistically significant at 95% C.I (Mann Whitney U test).
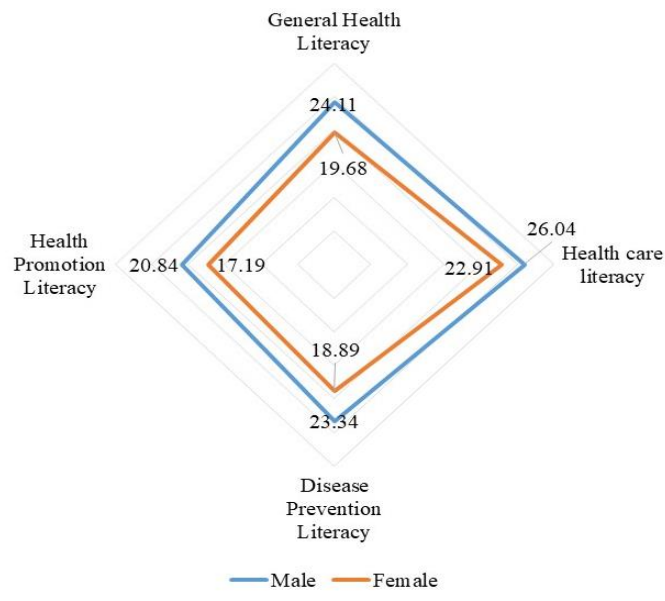

Figure 2. Radar chart showing difference in the median score of general health literacy and different health domains according to sex (n=375)

Table 3: Multivariable logistic regression showing association of adequate health literacy, health care literacy, disease prevention literacy and health promotion literacy with different independent variables (n=375)

Variables	General Health literacy aOR (95% C.I)	Health Care domain aOR (95% C.I)	Disease Prevention domain aOR (95% C.I)	Health Promotion domain aOR (95% C.I)
Age (Ref=Age >35years)	5.01(1.66-15.07)	2.04(0.97-4.29)	1.05(4.46-2.39)	5.08(1.16-22.3)
Sex (Ref=Female)	1.72(0.63-24.69)	0.70(0.31-1.56)	0.64(0.26-1.56)	-
SES (ref=Lower class[IV,V])	1.37(0.63-2.98)	-	-	1.055(.37-3.03)
Years of schooling ↑	1.25(1.11-1.41)	1.14(1.05-1.24)	-	1.21(1.03-1.12)
Employment (ref=Not in gainful employment)	3.91(1.29-11.80)	3.45(1.51-7.88)	6.41(2.24-18.35)	2.38(0.66-8.57)
Health care Professional in family (ref=present)	10.00(3.03-33.34)	14.28(4.01-50.05)	1.72(1.06-5.56)	12.5(3.57-50.11)
Decision makers of family (ref=yes)	2.56(1.06-6.25)	1.36(0.72-2.63)	2.43(1.16-5.26)	1.61(0.53-4.76)

Discussion

In the current community-based study using HLS-EU-Q47, adequate HL was found only in 11.7% of the participants, which is even lower than in other developing countries. In most countries across the world, adequate HL was found to be less than 50% [as mentioned in subsequent sentences]. In Kazakhstan, it was found to be 26.7%, (17) Latvia 21%, (7) Cameroon 25.8%, (9) Turkey 32.7%, (18) Germany 45.7% (19); whereas studies conducted in developed countries like Switzerland had adequate HL of 68.6%, (20) and Poland 65.2%. (21) A study conducted in Jodhpur, India, found the health literacy rate to be approximately 17.9%, which aligns closely with our current study's findings using the same assessment tool. However, it's essential to recognize that this was a hospital-based study, which may not fully represent the broader population (11). Even though proportion of participants with adequate health literacy was comparable, the median health literacy score was found to be lower than our study (16.9 with IQR: 12.0-28). This may be because of the difference in the literacy rate of the study participants in both the studies, which was much higher (around 80%) in the mentioned study (11) whereas in the present study it was 93%. Higher educational attainment was associated with higher HL levels and better understanding of instructions in the prescription (22).

Domains of health literacy

In present study adequate HL in health care literacy, disease prevention literacy and health promotion literacy were found as 20.6%, 12.3% and 5.9% respectively. In health promotion literacy understanding information was easier while accessing and applying health promotion information was difficult than other health domains. Similar findings were found in the studies done in Kazakhstan (17) and Dutch population (23). Indeed, these consistent findings underscore the necessity for stronger public health interventions with a focused emphasis on accessing and applying health promotion strategies. The foundation of today's health promotion is interventions designed to promote interactive and critical health literacy (24). These are the cognitive and social skills required to actively participate in daily situations, by extracting health information and understanding and applying those to different circumstances.

It was found that males were having better health literacy in all domains than women in the current study, whereas in a study done among Dutch population showed females had fewer difficulties than men in the domains of health care and disease prevention (25). However, no consistent findings were found in the literature. In Indian society, there exists a notable disparity in literacy rates between males and females, with females generally having lower literacy levels (26). Additionally, women often have less exposure to the outside world compared to men. These factors may contribute to the observed differences in health literacy levels, highlighting the importance of addressing gender disparities in education and access to information.

Factors associated with health literacy and its health domains

HL was found to be significantly associated with age of the study participants, years of schooling, employment status, decision makers of family, presence of health care workers in the family. Age less than 35 years was significantly associated with adequate general health literacy as well as disease prevention literacy and health promotion literacy. In the study done by Soh and Wamba in Cameroon showed the trend of increasing health literacy till middle age and then decreasing further drastically in older age; people aged 55years and above are more likely to have poor health skills than younger persons (9). Similar inverse relation between adequate health literacy with age was found in the studies done in Germany, Iran, Lithuania, Vietnam etc. (14, 18, 20, 27) In particular, older people tend to have a lower health literacy level because of deteriorating cognitive functions with age. Their ability to extract, analyse, and memorize information weakens, which leads to decreased capacity to deal with health-related information. Also, the lower rate of internet usage among elderly takes them to a vulnerable position regarding their health literacy capacity. (28)

The present study showed years of schooling was significantly associated with healthcare literacy and health promotion literacy. In a study done in Cameroon,(9) the average HL of participants who had no diploma or who had only completed primary education was 28.57 (SD=8.72) while for Doctorate/Ph.D. degree holders it was 34.07 (SD=8.64). Higher levels of educational qualification was found to be significantly associated with better HL (8, 14, 15) even though different assessment tools were used. So, educational institutions can inculcate appropriate environment to introduce health literacy programmes. The schools trained competencies such as ability to read and calculate, helps to adequately use health care facilities (26). Integrating formal literacy education with functional literacy skills in schools can significantly contribute to the development of health literacy among individuals.

Those in gainful employment was found to have higher odds of having adequate general HL and healthcare literacy. Similarly, those who were employed had the best health literacy mean index than retired, in a community-based study done in Cameroon (9). Our finding also corroborates with findings of a study done among Type 2 diabetic patients in Turkey by Nesrin et al using HLS-EU-Q-TR, which also showed that employed had significantly higher HL than

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those who were not (18). Similarly, a survey done in Latvia, multiple regression analysis indicated that being retired tend to have a lower health literacy, when compared to the population being full-time employed (8). The working environment, interactions made with the colleagues, monetary benefits obtained from the employment shapes different cognitive and health approaches which affects health literacy of the individual. It is likely that being employed provides good opportunities for general learning of literacy skills and active interaction with people which help to acquire skills to derive meaning from texts and perform better on HL (28).

Presence of healthcare worker in the family was found to have higher odds of having adequate HL in all domains, except disease prevention literacy. Healthcare professionals were found to have strongest influence than any other media/source, on the attitudes, beliefs as well as prognostic expectations of the patients (29). In a study done in Japan among general population, using HLS-EU-Q47, it was found that, there is a significant positive correlation between the individual and family HL. Family members with higher HL may help other family members to do health-related tasks and thus independently contribute to its better manageability and thereby resulting in better health literacy (30). In a qualitative study done in Switzerland found physicians to be ideal interlocutors, but limited access to them and brief consultations are barriers to obtaining and understanding health information (31). Indeed, having a healthcare worker in the family can provide individuals with greater ease in discussing health-related issues. This familial connection to healthcare professionals can positively influence health-seeking behaviours and contribute to higher levels of health literacy within the family unit.

Decision makers are found to have higher odds of having good HL in general health literacy and disease prevention literacy. Decision makers are usually more educated and higher earning member of the family which are important determining factors of HL for the whole family as well. This domain has rarely been explored before.

Conclusion

Among the study participants, 88.3% had limited HL, and only 11.7% had adequate HL. In general, HL in all domains was poor, and competencies should be developed focusing on individual health and cognitive domains. Participants had adequate HL in health care domain; they are more knowledgeable in finding information regarding diseases, judging the health care service provider for an illness, also understanding and following the instructions given. But adopting health promotion strategies and keeping the neighbourhood and housing to stay healthy was difficult. As the majority had limited HL, programs or policies should be formulated and implemented through root-level healthcare workers to alleviate the problem. The strength of the study is that it was a community based study done using a validated tool and its limitation is that it had a female preponderance, as most of the data collection was done during the working hours.

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