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Assessing Functional Health Literacy about Coronavirus Disease and its Association with Socio-demography of Community School Teachers in Gandaki Province of Nepal

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ABSTRACT

Background: Functional health literacy enables individuals to navigate health information and resources to make health decisions to choose and to use appropriate health services. It promotes self-health care management and to cope with crisis like Coronavirus disease 2019 (COVID-19). However, teachers' functional health literacy about COVID-19 study was scant. This study aimed to measure teachers' functional health literacy and its association with their socio-demographic characteristics.

Methods: This study was cross-sectional survey conducted among since June 29 to August 28, 2023. Sample size was 732. Multi-stage cluster sampling was used. Tool was developed by modified Delphi technique. Firstly, items about access to and apply health information for preventive measures of COVID-19 were developed from guidelines about COVID-19 remaining under functional health literacy framework. Then school teachers, health, language experts, and supervision were consulted for improvement.

Tool was consisted of socio-demography, access to and use of health information about COVID-19 prevention. Tool was piloted and correlation coefficient was calculated. Tool was self-administered at leisure period after taking informed consent from school head teachers and teachers for data collection. Data were entered and analyzed in SPSS version 27. Both descriptive and inferential statistics like Chi-square test was used to analyze data at 5% level of significance. Study proposal was approved by school of medical science, Kathmandu University

Results: Results showed that 59.2% of participants had adequate functional health literacy about COVID-19. Gender, ethnicity, and involvement in social health insurance were significantly associated with functional health literacy about COVID-19.

Conclusion: This study revealed that teachers have inadequate functional health literacy about COVID-19. This study results suggest interventions from authority of school education and health sector focusing gender, ethnicity and economy to promote teachers' functional health literacy and to make school and community resilient for future pandemic.

Keywords: COVID-19, Functional Health Literacy, School, Teachers

BACKGROUND

Coronavirus disease 2019 (COVID-19) pandemic impacted public health, education, and economic sectors. In early days of pandemic, COVID-19 infodemics could be countered by high quality health literacy of both receivers and senders (1). Vaccine acceptance is also increased by COVID-19 awareness to prevent spread of coronavirus (2). COVID-19 outbreaks are still possible because coronavirus mutation and its variants are still evolving (3). Here, COVID-19 functional health literacy is capability of individuals to access,

understand, appreciate and apply health information for health promotion, diseases prevention, and health care (4). It promotes individual's ability to access, read, evaluate, and apply health-related information (5). Further, low health literacy impairs individual's understanding of health messages and limits their ability to share their medical problems (6). Health literacy on COVID-19 affects people's capability to ascertain their health and health care quality (7). However, even university undergraduates and adolescents in schools Literature shows gaps in health literacy (8, 9).

The risk of transmissions of COVID-19 is high in schools due to crowding (10). School leaders' COVID-19 health literacy associates with implementation of health promotion in schools in Germany (11). In turkey, primary school teachers furnish children with basic knowledge about health literacy (12). Even health care workers identified gaps in the knowledge and attitude to practice evidence-based medicine about COVID-19 (13). Teachers have knowledge gaps about COVID-19; however, they have critical role to promote health in school (14). Private schools teachers in Chitwan had good knowledge, favorable attitudes, and adequate practices about COVID (15). Infection prevention behavior requires self-restraint, disinfection care, hand washing, wearing masks and vaccination (16). The pandemic affected school students in mental health issues (17). However, study on teachers' health literacy about COVID-19 seems scant in Nepal. Hence, this study purposed to measure function health literacy about COVID-19 and its association.

METHODS

Study Design and Settings

This cross-sectional study was conducted from June 29 to August 28; 2023.This study was conducted in community schools of Gandakí province. Nepal lies between India and China. It has seven provinces. Gandaki province has most famous tourisms sites where people's high mobility exists. Both basic and secondary level community schools were selected because they are collective workplace where COVID-19 highly transmits.

Study Population, Sample Size and Sampling

Study population was all teachers of community schools. Sample size was calculated by $n= z^2 p (1-p)\div e^2$ where, n- sample size, confidence interval-95%, percentage of vaccinating population (p) & percentage of not vaccinating population (q) & marginal error (e) = 0.05. Prevalence of full dose vaccination ≥ 18 years at October 31, 2021 dashboard record Ministry of Health and Population (p) = 36.1%= 0.36 & non-vaccination (q) = 1-0.36= 0.64. Therefore, (n_0) = 1.96 ×1.96× 0.36×0.64÷ (0.05)2 = 354. Finite population size of school teachers (N= 31,888) and n_o= 354 correction for proportions, effective sample size formula is n = no/(1+ (no-1)/N) = 354÷ 1.01 = 350.49= 350. Design effect was calculated by 1+ p (no-1). Where intracluster correlation (p) = 0.19 and average size of cluster (n_0) = total teachers ÷ total schools in Gandaki province = 31888÷4594= 6.94= 7, design effect = 1+ 0.15 (7-1) = 1+.9= 1.9. The effective sample size (n) = Sample size × design effect = 350×1.9= 665. And 10% non-response rate was taken = 66.5, Sample size becomes 665+66.5=732

Moreover, target population was in Manang (P_1=315), Kaski (P_2=5562), and Nawalpur (P_3= 3519). P= P_1+ P_2+ P_3, p=5562+315+3519. = 9396 (Flash report, 2018/19). Proportionate sample size of teachers was for Manang, sample size (n_1) = 732×315÷9396 = 24.29, Kaski (n_2) = 732 ×5562÷9396 = 433.3, and Nawalpur district (n_3) =732×3519÷9396 = 274.05.

Multi-stage cluster sampling was engaged. In the first stage of sampling, district was considered as cluster. Manang, Kaski and Nawalapur districts were randomly chosen. Secondly, rural municipals such as Chame from Manang, Rupa from Kaski and Bundikali from Nawalpur) and urban municipals like Pokhara-lekhnath from Kaski and Madhyabindu from Nawalpur were randomly selected. Manag district was without urban municipal. Then, wards of these municipals were selected if they were large size. Lastly, schools were randomly selected and then all teachers of the selected schools were eligible participants. Manang district has no urban municipal.

Tool Development, Validity Assurance and Data Collection Procedure

Questionnaire was prepared by modified Delphi techniques using different literature (18- 20). Firstly, tool was prepared in English and then translated into Nepali language. Both script of tool was assessed by health, language experts and supervisors. Tool consisted of socio-demographic characteristics, and construct of functional health literacy (10) about COVID-19. English instrument translated into Nepali language and back translated it. Finally, Nepali script instrument was administered in the field. Socio-demographic indicators such as gender (male and female), age in years, ethnicity was (Brahmin, Chhetri, indigenous and Dalits), education (intermediate /+2, bachelor's and masters' degree), marital status (never married, married), work experience in years, involved in social health insurance (yes or no) were included. Additionally, functional health literacy was measured in access and use of health

information for COVID-19 prevention. Five items (1-5) of access and thirteen items (6-18) of application were developed for preventive measures against COVID-19. Both response options and likert scale with codes fully agree (6), mostly agree (5); fairly agree (4), somewhat agree (3), slightly agree (2), very slightly agree (1) was used.

Tool was pretested among 36 teachers in Bhimbad municipal of Tanahu district of Gandaki province. After pretesting, reliability was appraised by split-half method. Reliability coefficient/ Cronbach value of functional health literacy was =.73. Its adaptation was made to provide social and concept of original questionnaire, teachers' understanding level.

Data were collected valid structured-questionnaire by self-administration. In field work, schools were visited with safety precautions against COVID-19. Building rapport with gatekeepers, I entered school premises and met head teachers or assistant head teachers. I shared my purpose of visit along with research request letter delivered from school of education for field work. School officials accepted me as researcher and permitted to collect data during leisure periods. At leisure, I visited teachers in teachers' room, shared purpose of visit and distributed questionnaire after taking informed consent. Rapport was built with head teachers. After taking informed consent from head /teachers, questionnaire was distributed among teachers their leisure period and collected at their convenience. Teachers were excluded who had insufficient visual activity to read instrument, were sick and absence in the day of data collection. Participation was completely voluntary.

Data Analysis and Interpretation

Data were entered and analyzed using descriptive and inferential statistics on the Statistical Package for Social Sciences, version 27.0. The summative score of functional skills was 108 ranging from 18 to 108. Teachers' functional health literacy skills were categorized into adequate (mean and above) and inadequate (below mean) by mean value (1). The chi-squared test was used to assess the significance differences of teacher characteristic and functional health literacy skills categories. The probability $P < 0.05$ was taken as the minimum level of significance.

Ethical approval statement

The Institutional Review Committee of Kathmandu University School of Medical Science (IRC-KUSMS Reg. No. 143/ 22) cleared research ethics at August 10, 2022.

RESULTS

Of 737 participants, 53.7% were female. About three fifth of teachers (61.7%) were 40 and below years. A majority of teachers were Brahmin 57.8% followed by indigenous 26.9%, Dalits11.2%, and Chhetri 4.2%. Teachers had master's (38.7%) followed by bachelor's (33.2%) and intermediate /+2 (28.1%) degree. Results show that about two-fifth of teachers (38.1%) had equal or less than nine years' experience, followed by 10-19 years (31.0%), 20-29 years (25.8%), and 30 years and above (5.1%). Additionally, 61.9% of teachers had ten or more years of experience in the teaching. A majority of teachers were working at basic 51.6% followed by secondary (27.8%) and pre-primary (20.5%) levels in Table 1. Table 2 depicts the majority of participants (84.2%) who were married, followed by unmarried (14.6%) and divorced/ separated/ widowed (1.2%). Additionally, 50.2% of teachers had not involved in social health insurance. Likewise, 59.0% of teachers were not engaged in COVID-19 insurance, as shown in table 1.

Table 1. Background characteristics of respondents (n=737)

	Attributes	Frequency	Percentage
Gender	Male	341	46.3
	Female	396	53.7
Age	≤ 40 years	452	61.7
	≥ 41 years	281	38.3
Ethnicity	Brahmin	398	57.8
	Chhetri	29	4.2
	Indigenous	185	26.9
	Dalits	77	11.2
Educational level	+2 or intermediate	207	28.1
	Bachelors	245	33.2
	Masters' and above	285	38.7
Teachers' work experience	≤ 20 years	501	69.1
	≥ 21 years	224	39.9
Marital status	Never married	107	14.6
	Married	628	85.4
Membership in social health insurance	Yes	367	49.8
	No	370	50.2

Functional Health Literacy about COVID-19 in Two Dimensions

Table 2 shows that most participants had access to health information about COVID-19 from internet followed by radio/TV and magazines/ newspapers. Most participants agreed that COVID-19 vaccines were distributed by community-based health institutions at free of cost to public in Nepal. During pandemic, participants self-reported that they would rather use

handkerchiefs in coughing/ sneezing than avoidance of handshaking with others friends and maintenance of physical distance of 2 meters. Participants not only avoided to go school up to 14 days in suspect of COVID-19 infection but also informed to school authorities about COVID-19 infection. Moreover, most participants rated that they restricted suspicious students of COVID-19 infection to enter school for up to 14 days and operated online teaching across pandemic. Participants reported that they preferred wash their hands with soap and water, use hand sanitizers, use face masks to ventilate classroom during pandemic. Moreover, respondents rated that they preferred full dose to booster dose vaccination against COVID-19 in table 2. Functional health literacy status was (M=5.55, SD= 0.70).

Table 2. Statements of functional health literacy about COVID-19

SN	Items	M	SD
	Access to health information	5.60	0.62
1	I had access to information about COVID-19 on internet.	5.61	0.87
2	I also got information about COVID-19 from magazines, newspapers.	5.46	0.91
3	I got information about preventive measures on COVID-19 from radio/TV.	5.56	0.81
4	Community-based health institutions provide vaccines against COVID-19.	5.65	0.83
5	COVID-19 vaccines are freely available to public in Nepal.	5.74	0.76
	Application of health information	5.54	0.55
6	I used to place handkerchief/elbow on my mouth/nose in coughing/sneezing.	5.66	0.92
7	I did not have physically contacts like hand shaking, hugging.	5.73	0.74
8	I maintained 2 meters physical distance among people.	5.48	0.90
9	I did not go school up to 14 days in suspect of COVID-19 infection.	5.04	1.60
10	COVID-19 infection suspected students were not allowed to enter school up to 14 days.	5.18	1.38
11	I had informed school authority about COVID-19 infection.	5.62	0.92
12	I had taught students through digital media.	5.32	1.34
13	I often washed hands with soap and water in COVID-19 pandemic.	5.83	0.54
14	I often used hand sanitizers in COVID-19.	5.74	0.74
15	I had maintained ventilation in class room during pandemic	5.51	0.93
16	I had used mask in class room during COVID-19 pandemic	5.73	0.75
17	I had full dose vaccination like Vero Cell-2 doses and Johnson-1 vaccines	5.68	0.89
18	I have booster dose vaccination against COVID-19	5.44	1.35

Note- M-mean, SD- standard deviation

Overall Functional Skills about COVID-19

Table 3 shows that 59.2% of teachers overall had adequate and 40.8% inadequate functional skills about COVID-19 pandemic.

Table 3. Level of overall functional literacy about COVID-19

Category	Frequency	Percent
Inadequate	301	40.8
Adequate	436	59.2

Association of Functional Health Literacy about COVID-19 with Participants' Characteristics

Table 4 shows 64.9% of female and 52.5% of male teachers had higher adequate function health literacy about COVID-19. Gender was significantly related with functional health literacy about COVID-19 (*P*=.001). Further, teachers with 40 and below years (61.7%) and 41 and above years (55.5%) had adequate functional literacy about COVID-19. Age was insignificantly (P=.09) affected functional health literacy about COVID-19. Ethnically, adequate functional health literacy about COVID-19 were the highest among Dalits t (75.3%) followed by indigenous (55.7%) and Bahun/ Chhetri (58.3%) teachers. Ethnicity was significantly associated with teachers' functional literacy on COVID-19 (P=.01). Further, 57.7% of bachelor's and below and 81.4% of master's and above degree teachers had adequate functional literacy about COVID-19. Teachers' qualification was insignificant (*P*=.32) with their functional health literacy about COVID-19. Moreover, 61.2% of 20 and below and 54.5% of 21 and above years' work experienced teachers had adequate functional health literacy about COVID-19. Teachers' work experience was insignificant (P=.11) with their functional health literacy about COVID-19. Moreover, 54.2% of never married, and 60.0% married teachers had adequate functional health literacy about COVID-19. Marital status was insignificantly (P=.25) associated with functional health literacy about COVID-19. Likewise, 63.8% involved and 54.6% not involved teachers in social health insurance had adequate functional health literacy about COVID-19. Teachers' involvement in social health insurance was significantly related to functional health literacy (P=.01) in table 4.

Table 4. Association of functional health literacy about COVID-19 with participants' background variables

Variables		Inadequate n (%)	Adequate n (%)	χ^2	P
Gender	Male	162 (47.5)	179 (52.5)	11.67	.001
	Female	139 (35.1)	257 (64.9)		
Age groups	≤ 40 years	173 (38.3)	279 (61.7)	2.76	.09
	≥ 41 years	125(44.5)	156 (55.5)		
Ethnicity	Bahun/Chhetri	177 (41.5)	250(58.5)	9.29	.01
	Dalit	19 (24.7)	58(75.3)		
	Indigenous	82(44.3)	103(55.7)		
Education status	≤ Bachelors'	191(42.3)	261(57.7)	.96	.32
	≥ Masters'	110(28.6)	175(81.4)		
Work experience	≤ 20 years	213 (38.8)	336(61.2)	2.45	.11
	≥21 years	80 (45.5)	96 (54.5)		
Marital status	Never married	49(45.8)	58(54.2)	1.28	.25
	Married	251(40.0)	377(60.0)		
Member in social health insurance	Yes	133(36.2)	234 (63.8)	6.40	.01
	No	168(45.4)	202 (54.6)		

DISCUSSION

This study was assessed COVID-19 functional health literacy among community school teachers in Gandaki province of Nepal. Results showed that 59.20% of participants had adequate functional health literacy about COVID-19. Gender, ethnicity and membership in social health insurance significantly associated with COVID-19 functional literacy.

This present study shows about 60% of teachers have adequate function health literacy about COVID-19. In contrast, Indonesian adults' functional literacy about COVID-19 vaccination was high due to high use of internet, social media and belief about COVID-19 vaccines (1, 7). Likewise, gender, race, and monthly income supported with vaccine literacy in African adult population (4). This study was contrasted by Iranian adults study has low functional health literacy that hinder comprehension and utilization of health-related information, such as scheduling appointments, interpreting medical exams and forms, and preventing diseases (5). Jovic-Vranes et al showed adequate function health literacy among patients in Belgrade (6) supported health literacy In contrast; Bhusal et al showed university undergraduates had more limited health literacy in Nepal (8). Likewise, school adolescents had low health literacy and health promotion measures (9).

This study Gender was significantly associated with COVID-19 health literacy (p=.001). However, there is a balance between sexes on functional literacy about COVID-19 and vaccination (7). It is crucial to increase public health literacy in managing the pandemic. South African adult woman significantly associated vaccine literacy and vaccination against COVID-19 (4). Undergraduate female students were significantly 1.6 times more likely to have limited health literacy (8). In turkey, primary school teachers' health literacy of COVID-19 was affected by gender, school, and grade/year of education (12). Female teachers have higher knowledge and practice about COVID-19 (14).

This study depicted ethnicity significantly associated with functional literacy about COVID-19 (p=0.01). Likewise, Dalits and indigenous people living with chronic obstructed pulmonary diseases associate health literacy in Nepal (20). Similarly, South African adult self-identifying as Black/African or Colored (i.e., people of mixed ethnic descent) significantly associated with vaccine literacy and COVID-19 vaccination (4). Moreover, south non-black African population group has significantly high vaccine hesitancy compared to black Africans (2). Vaccination of Hispanic participants in United States was affected by technological literacy and pre-registration, language and literacy, immigration status, and location and transportation. and engagement through schools (20).

This study depicted membership in social health insurance significantly associated with functional literacy about COVID-19 (p=.01). In contrast, social health insurance /health care cost hindered COVID-19 vaccinating among Hispanic population of Arkansas but health care providers' recommendation, workplace vaccination and engagement through school facilitate vaccination among them (12). Moreover, health and social sector organization engagement enhances functional health literacy about COVID-19. South African with high household income correlates with low vaccine hesitancy about COVID-19 (2). Undergraduate students with poor self-rated financial status are 2.9 times more likely to have significantly associated with

limited health literacy (8). Vaccination of Hispanic participants of United States was affected by health insurance/health care costs, workplace vaccination, and engagement through schools (20).

This study has limitations. This study was focused among teachers of community school in one province of Nepal. Therefore, result was not generalized across community school teachers of Nepal. This cross-sectional data collected at specific time needs precaution to understand causal relationships among variables (1). Although, self-perception, compared to facts, can be very time sensitive, and could increase the correlation due to a reporting bias in self-administered questionnaire. Finally, this was self-administered questionnaire; it can be time sensitive, recall bias, and self-perception, platform preference for information dissemination (4).

Health literacy is relevant for people in need of information and services, as well as for healthcare workers and individuals who provide vaccines and access to them. Other similar studies are needed, including larger and more representative groups of the population, with the aim of improving knowledge about the relevance of health literacy skills of the public, in particular about the vaccinations during epidemics, and tailoring specific interventions to increase them where necessary, in addition to adapting health communication and counteracting vaccine hesitancy. Health literacy is relevant for people in need of information and services, as well as for healthcare workers and individuals who provide vaccines and access to them.

CONCLUSION

This study reveals that 59.2% of teachers overall had adequate functional health literacy skills about COVID-19. Teachers have gaps in functional health literacy skills about COVID-19. Functional Health literacy was significantly associated with gender and ethnicity of teachers. Therefore, this study suggests interventions from authority of school education and health sector to promote function literacy skills on COVID-19 and self-care management in future.

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Conflict of interest:

The authors declare no conflict of interest.

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