Health Literacy and Well being of People Living with Human Immune Deficiency Virus (HIV) in Nasarawa State

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Abstract
Health literacy which is people's abilities to access, process, and comprehend health-related information, has been found to have a strong relationship with patients' wellbeing among complex and chronic diseases such as HIV infection. This study assessed the health literacy domains in relation to age and health well-being of people living with HIV in Nasarawa State. A quantitative, cross-sectional descriptive study was conducted among 397 HIV patients on ART in Nasarawa State. The participants were recruited into the study using a multi-stage sampling technique. Data on socio-demographics, health literacy and health wellbeing were collected using adopted, modified and validated questionnaire. SPSS version 22 and MINITAB14 were used in the data analysis. The study revealed that, the general health literacy of the study population was above average, certain domains of health literacy such as: feeling understood and support by health care providers, ability to actively engage with healthcare provider, and navigating the healthcare system were significantly associated with age (p< 0.001). Majority (81.6%) of the respondents had minimal health well-being and few health literacy domains such as: actively managing ones' health, appraisal of ones' health information, ability to actively engage with healthcare provider and understanding health information well enough to know what to do were found to be associated with the level of health well-being of the patients (p< 0.001). The study recommends incorporation of routine family counseling and all HIV social-support networks into the routine patients' care in HIV treatment centers to gain family acceptability and improve patient's well-being.

Keywords: *Health literacy, Well being, Human Immune-deficiency Virus*
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Introduction
Health literacy refers to a person's ability to obtain process and understand basic health information and services necessary to take appropriate health decisions (Yim, Shumate, Barnett. & Leitman 2018). The World Health Organization (WHO) defines it 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 (WHO, 2022). Heath literacy means more than being able to read pamphlets, it includes the totality of processes involved in appreciating and utilizing health information effectively and is essential if patients are to exercise control over their own health. Health literacy has been found to have a strong relationship with patients' wellbeing, late reporting at the health care facility and poor health outcome in patients with chronic diseases conditions (Zhang, Or & Chang, 2021; Agaba, Meloni, Sule, Agbaji, Ekeh & Job, 2014). For example, amongst patients with type 2 diabetes mellitus, inadequate health literacy was 29% and was significantly associated with general wellbeing and educational level below a high school education (Abdullah, Liew, Salim, Ng & Chinna 2019). Similar report was made in

United States of America (USA) where inadequate health literacy independently predicted all-cause mortality and cardiovascular death among community-dwelling elderly persons (Paasche-Orlow, 2005).

Globally, low health literacy has become a salient challenge that affects many health care systems of the world including developed countries and yet many health care personnel do not recognize the problem or have the confidence to deal with it. Report has shown that, approximately 21% of American adults are illiterate on health issues while about one in ten persons in Europe have inadequate health literacy (Davis, Michielutte, Askov, Williams & Weiss, 2019; Sørensen, Pelikan, Rothlin, Ganahl, Slonska, Doyle et al, 2015). Similar reports were also made among Asian countries where a systematic review and meta-analysis conducted in Iran revealed that health literacy in the Iranian population was inadequate and borderline (Dadipoor, Ramezankhani, Aghamolaei, Rakhshani & Safari-Moradabadi, 2018). Also the prevalence of low health literacy in China was 85% and was significantly associated with level of education, occupation, annual household income but not with gender or age (Wu, Wang, Cai, Bao, 2017).

The situation in Nigeria is so precarious that, only 38% of in-school adolescents possessed adequate health literacy and yet little or no action has been taken to avert it negative effect on management of chronic diseases conditions (Shabi & Oyewusi 2018; Ajiboye, Oyetunde, Tijani & Sanusi, 2016). It is worthy of commendations, the efforts of National Agency for Control of AIDS (NACA) and other health based Non-governmental organizations in educating the Nigerian populace about the need to know their HIV status however, more need to be done to improve patients' wellbeing, prevent poor health outcomes and late presentation to the health facility by Nigerian people living with HIV which in part may be due to inadequate health literacy. Without investigating the subject of health literacy and health wellbeing among people living with HIV, the 2030 UNAIDS target of 90–90–90 target: which in practical terms translates to: 90% of the population should know their HIV status, 90% of those with known HIV infection status should be on treatment, and 90% of those on treatment should have sustained suppressed viral loads will be illusive (Bessong, Matume & Tebit, 2021). This study is designed to assess the health literacy scales in relation to age and health well-being of people living with HIV in Nasarawa State.

Methods and Materials

This study was carried out in some selected ART facilities in Nasarawa State, North-Central Nigeria. It was a quantitative, cross-sectional descriptive research conducted on people living with HIV (PLWHIV) aged 10 years and above who were accessing treatment at the ART facilities in Nasarawa state. Data was collected using "Health Literacy Questionnaire" (HLQ) adopted from Professor Richard Osborne, modified and validated. Modification of the questionnaire was done to capture socio-demographic and health wellbeing variables of people living with HIV. Section A of the questionnaire assessed the socio-demographic characteristic such as age, occupation, marital status, religion and educational status. Section B assessed the health literacy domains of the participants. It comprised 44 items over nine independent scales, each representing a different element of the over-all health literacy construct: (1) Feeling understood and supported by healthcare providers; (2) Having sufficient information to manage my health; (3) Actively managing my health; (4)Social support for health; (5) Appraisal of health information; (6) Ability to actively engage with healthcare providers; (7) Navigating the healthcare system; (8) Ability to find good health information; and (9) Understanding health information well enough to know what to do. There are four to six items in each domain. The first five domains, four-point ordinal response options were used (strongly

disagree, disagree, agree and strongly agree) which ask the respondents to indicate their level of agreement on one of the four response options. The remaining domains (6-9) represent scales of self-reported capability and items within these scales are scored on five-point ordinal response options (cannot do, very difficult, quite difficult, quite easy and very easy). Section C measured the health well-being using eight questions with four-point ordinal response **o**ption to indicate their level of agreement on one of the four response options. Each of the questions was assigned positive scores of 1, 2, 3 and 4 against often, sometimes, seldom and never respectively. The scores were computed, converted to percentages and categorized into two levels as optimal health well-being (75-100%) and minimal health well-being (<75%). The questionnaire was further pretested using test re-test method in a population having similar characteristics with the study population. The reliability coefficient was found to be 0.8. Consenting PLWHIV who were on antiretroviral therapy for at least 3 months and not on admission were included in the study while PLWHIV with co-morbidities such as tuberculosis, Diabetes Mellitus, Hypertension, mental disorders, hepatitis or any other medical conditions whose medications may interact with the antiretroviral drugs were excluded. The minimum sample size of 397 was determined using the Yamanes' formula.

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

Where;
n is the sample size,
N is the population size, and,
e is the level of precision.
Thus, the sample size is

n= 50468/1+50468×0.0025

Therefore, sample size = 50468/127 =397

Total of 397 people living with HIV in selected ART clinics in Nasarawa State were selected for the study. The sample was proportionately selected based on the number of clients per facility and multi-staged sampling technique was used for sample selection: Stage one involve the selection of one local government from each senatorial district by simple balloting technique. From the Northern senatorial district, Akwanga was selected; Awe was selected from the Southern senatorial district, while Keffi was selected from the Western senatorial district. Stage two was the selection of one facility rendering HIV care and treatment services from each of the Local Government Area selected by simple balloting. Stage three was the selection of clients from each of the selected facilities; systematic sampling technique was used to select the proportionate number of clients from the sample frame (facility ART register). Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0 and MINITAB 14. The observed similarities and differences were tested using the Chi-square test and ANOVA while cross tabulation of necessary factors with observed variables were done. P-value of less than 0.05 was considered significant. Informed consent was sought from selected respondents after careful explanation of the purpose of the study and intended respect for confidentiality had been stated. Ethical approval was collected from the Research and Ethical Committee of the Nasarawa State ministry of health Lafia. Limitations of the study include the problem of recall bias on the number and periods of missed doses.

Results
Table 1: *Cumulative demographic presentation of the respondents according to gender (n=397)*

Variables	Gender		Total N (%)
Age	**Male (%)**	**Female (%)**	
10-19	0 (0.0)	12 (4.2)	12 (3.0)
20-29	14 (13.0)	82 (28.5)	96 (24.2)
30-39	41 (38.0)	115 (39.9)	156 (39.4)
40-49	34 (31.5)	61 (21.2)	95 (24.0)
50+	19 (17.6)	18 (6.2)	37 (9.3)
Occupation			
Farming	57 (52.8)	160 (55.7)	217 (54.9)
Business	25 (23.1)	68 (23.7)	93 (23.5)
Civil servant	23 (21.3)	25 (8.7)	48 (12.2)
Student	1 (0.9)	33 (11.5)	34 (8.6)
Driving	2 (1.9)	0 (0.0)	2 (0.5)
House wife	0 (0.0)	1 (0.3)	1 (0.3)
Religion			
Christianity	70 (64.8)	177 (61.5)	247 (62.4)
Islam	37 (34.3)	108 (37.5)	145 (36.6)
Traditional	1 (0.9)	3 (1.0)	4 (1.0)
Marital Status			
Never married	10 (9.3)	42 (14.6)	52 (13.1)
Married	89 (82.4)	178 (61.8)	267 (67.4)
Divorced	7 (6.5)	26 (9.0)	33 (8.3)
Widowed	2 (1.9)	42 (14.6	44 (11.1)
Educational Status			
No formal education	9 (8.3)	91 (31.6)	100 (25.3)
Primary	33 (30.6)	79 (27.4)	112 (28.3)
Secondary	34 (31.5)	65 (22.6)	99 (25.0)
Tertiary	32 (29.6)	85 (21.5)	85 (21.5)

Table1 shows that, 12 respondents (all females) representing 3% of the 397 respondents were within the age of 10-19 while majority 156 (41 males, 115 females) representing 39.4% of the respondents were within the age of 30-39. The table also shows that 217 respondents (57 males, 160 females) representing 54.9% of the entire respondents were farmers, only 48 (23 males, 25 females) representing 12.2% of the entire respondents were civil servants. It can be seen also from the table that 247 respondents (70 males, 177females) representing 62.4% of the entire respondents were Christians, 145 respondents (37 males, 108 females) representing 36.6% of the entire respondents were Muslims. Furthermore, the table also shows that majority 267 (89 males, 178 females) representing 67.4% of the entire respondents were married only a few were staying alone. Concerning educational status of the respondents, the table shows that majority of the respondents had attained secondary education out of which most of them were females.

Table 2: *Mean health literacy domains of respondents according to age*

Domains	Variables (N=396) Age	Mean score (SD)	Min score	Max score	F-stat.	P. value
1. Feeling understood and supported by healthcare providers	10-19 20-29 30-39 40-49 50+	3.3125 (0.7160) 3.4714 (0.4320) 3.7003 (0.3969) 3.8000 (0.3212) 3.8716 (0.3516)	1.75 2.00 2.75 2.75 2.75	4.00 4.00 4.00 4.00 4.00	13.524	<0.001
2. Having sufficient information to manage my health	10-19 20-29 30-39 40-49 50+	3.3125 (0.2638) 3.3047 (0.3308) 3.3125 (0.3665) 3.3816 (0.3069) 3.4257 (0.4443)	3.00 2.50 2.25 2.25 1.75	3.75 4.00 4.00 4.00 4.00	1.387	0.238
3. Actively managing my health	10-19 20-29 30-39 40-49 50+	3.3500 (0.2713) 3.3063 (0.3243) 3.3551 (0.3296) 3.3537 (0.2967) 3.3189 (0.2807)	2.80 2.80 2.60 2.80 2.80	3.80 4.00 4.00 4.00 4.00	0.455	0.769
4. Social support for health	10-19 20-29 30-39 40-49 50+	3.0500 (0.5054) 3.1000 (0.4794) 3.0141 (0.6857) 2.9695 (0.4920) 2.7946 (0.4095)	2.60 2.00 1.80 2.20 2.00	4.00 4.00 8.80 4.00 3.80	2.059	0.085
5. Appraisal of health information	10-19 20-29 30-39 40-49 50+	3.3167 (0.3761) 3.1896 (0.3993) 3.2321 (0.3373) 3.2526 (0.3090) 3.2162 (0.3954)	2.40 2.00 2.00 2.20 2.00	3.80 4.00 4.00 4.00 4.00	0.602	0.662
6. Ability to actively engage with healthcare provider	10-19 20-29 30-39 40-49 50+	4.3833 (0.7056) 4.1932 (0.6667) 4.5327 (0.5815) 4.6484 (0.5692) 4.7730 (0.5520)	2.60 2.80 2.60 2.60 2.80	5.00 5.00 5.00 5.00 5.00	9.810	<0.001
7. Navigating the healthcare system	10-19 20-29 30-39 40-49 50+	4.0267 (0.6471) 3.9911 (0.6500) 4.2012 (0.5198) 4.1854 (0.5009) 4.2562 (0.6816)	2.33 2.17 2.33 2.17 1.67	4.83 5.00 5.00 5.00 5.00	2.730	0.029
8. Ability to find good health information	10-19 20-29 30-39 40-49 50+	3.8833 (0.3663) 3.7542 (0.6360) 3.8391 (0.5392) 3.8211 (0.5445) 3.8703 (0.5910)	3.20 2.00 2.40 2.00 2.00	4.40 5.00 5.00 5.00 5.00	0.478	0.752
9. Understanding health information well enough to know what to do	10-19 20-29 30-39 40-49 50+	3.6500 (0.5728) 3.4896 (0.7160) 3.5853 (0.6355) 3.6758 (0.5879) 3.5730 (0.7748)	2.80 1.80 1.60 1.80 1.80	4.80 5.00 5.00 5.00 5.00	0.991	0.412

Table 2 shows high mean scores of heath literacy among the respondents and their age in all the nine domains. Feeling understood & support by health care providers, ability to actively engage with healthcare provider, and navigating the healthcare system (<0.001, <0.001 and 0.029 respectively) were found to be significantly related to age. The table also shows that, feeling understood and supported by healthcare providers domain increase steadily with age of respondents. There is a steady increase in mean score of respondents' ability to actively engage with healthcare provider from ages 20 and above. This means that, the ability to actively engage with healthcare provider increase steadily from age 20 and above. Similarly, navigating the healthcare system increases sharply with age from the age of 20 years before it peaked at age of 50.

Table 3: *Distribution of socio-demographics and level of health well-being of the respondents*

Variables	Health Well-being		Total N (%)	df	χ^2	p. value
	Optimal	**Minimal**				
Age				4	3.4 39	0.487
10-19	2(16.7)	10(83.3)	12(3.1)			
20-29	13(13.5)	83(86.5)	96(24.5)			
30-39	34(21.8)	122(78.2)	156(39.8)			
40-49	18(19.8)	73(80.2)	91(23.2)			
50+	5(13.5)	32(86.5)	37(9.4)			
Total	72(18.4)	320(81.6)	392(100.0)			
Gender				1	3.238	0.051
Male	26(24.1)	82(75.9)	108(27.6)			
Female	46(16.2)	238(83.8)	284(72.4)			
Total	72(18.4)	320(81.6)	392(100.0)			
Marital Status				3	7.630	0.054
Never married	10(19.2)	42(80.8)	52(13.3)			
Married	55(20.6)	212(79.4)	267(68.1)			
Divorced	6(18.2)	27(81.8)	33(8.4)			
Widowed	1(2.5)	39(97.5)	40(10.2)			
Total	72(18.4)	320(81.6)	392(100.0)			
Educational status				3	27.947	<0.001
No formal education	3(3.1)	95(96.9)	98(25.0)			
Primary	17(15.5)	93(84.5)	110(28.1)			
Secondary	28(28.3)	71(71.7)	99(25.3)			
Tertiary	24(28.2)	61(71.8)	85(21.7)			
Total	72(18.4)	320(81.6)	392(100.0)			

Table 3 shows that, only 18.4% of the respondents had optimal level of well-being while 81.6% of the respondents had minimal level of well-being. Educational status was found to be significantly associated with level of health well-being of the respondents (p-value <0.001). Age, gender and marital status of the respondent were not significantly associated with level of health well-being of the respondents.

Table 4: *Health literacy domains and level of health well being of respondents*

Domains	Health wellbeing		f-stat	P-value
	Optimal Mean (SD)	Minimal Mean (SD)		
1. Feeling understood and supported by healthcare providers	3.6597 (0.3120)	3.6713 (0.4444)	0.044	0.833
2. Having sufficient information to manage my health	3.3958 (0.4084)	3.3232 (0.3372)	2.514	0.114
3. Actively managing my health	3.4722 (0.3541)	3.3128 (0.2993)	15.556	<0.001
4. Social support for health	3.1264 (0.6043)	2.9832 (0.5640)	3.692	0.055
5. Appraisal of health information	3.3611 (0.4359)	3.1994 (0.3276)	12.570	<0.001
6. Ability to actively engage with healthcare provider	4.2847 (0.5092)	4.5388 (0.6442)	9.816	0.002
7. Navigating the healthcare system	4.1365 (0.5138)	4.1463 (0.5904)	0.017	0.897
8. Ability to find good health information	3.8514 (0.6380)	3.8118 (0.5506)	0.286	0.593
9. Understanding health information well enough to know what to do	3.7458 (0.7550)	3.5526 (0.6326)	5.091	0.025

Table 4 shows the relationship of health literacy domains and health well-being of the respondents. Actively managing my health, Appraisal of health information, Ability to actively engage with healthcare provider and Understanding health information well enough to know what to do domains of Health literacy were found to be significantly related to level of health well-being among PLWHIV in Nasarawa State.

Discussion
This study identified that majority of the respondents were within the ages of 20 and 49 years old which confirm the earlier report by Atoyeb, Musa, Bolarinwa, Durowade, Ogundiran & Babatunde (2019) that young adults are mostly the group infected with HIV in Nigeria. Analyses further revealed that majority of the respondents were female which shows that women are mostly infected with HIV virus as against their male counterpart. These findings were respectively consistent with findings in Ibadan (62.0%), Kogi (62.7%) and Sagamu (69.1%) where majority of the respondents were of the female gender (Folasire, Irabor & Folasire, 2012; Fatiregun, Mofolorunsho & Osagbemi, 2009; Motilewa, Ekanem, Onayade & Sule, 2015). Women are more vulnerable to HIV infection than men during unprotected sexual intercourse, because of larger surface areas exposed to contact during intercourse and because the females are the recipient of infected semen, as well as possible micro trauma in their genital tract during sexual activity. Likely explanation could also be due to high levels of polygamy, early marriage, early sexual debut, female genital mutilation and low girl child education in the study area. In respect to the respondents' occupation, more than half of the respondents were farmers which align with the fact that farming is the main occupation of the people of Nasarawa State owing to her vast fertile land. We found majority of the respondents with at least primary school education which implies they have the capacity to read and understand pamphlets and health information.

The mean values of all the Health Literacy (HL) domains were found to be on the high side which shows that the study population has high health literacy. This has been demonstrated in many studies concerning care for other chronic diseases where respondents with chronic diseases conditions manifest high health literacy levels (Tavousi, Haeri-Mehrizi, Rakhshani, Rafiefar, Soleymanian, Sarbandi, Ardestani, Ghanbari, & Montazeri, 2020; Haghighi, Lamyian, & Granpaye, 2015). The high health literacy of the respondents observed in this population may be associated to the respondents' level of formal education. This is consistent with other previous studies that educational level is significantly related to health literacy among patients (Brandstetter, Atzendorf, Seelbach-Göbel, Melter, Kabesch & Apfelbacher, 2020; Cindi, Shumate, Barnett & Leitman, 2018; Komenaka, Nodora, Machado, Hsu, Klemens, Martinez, Bouton, Wilhelmson & Weiss, 2014). However, statistically significant association was found between some health literacy domains and age bracket of respondents. For example, feeling understood and support by health care providers, ability to actively engage with healthcare provider, and navigating the healthcare system were significantly associated with age of the respondents. The relationship discovered between the domains and age is such that feeling understood and supported by healthcare providers increases as the age of respondents increase. Similar relationship was demonstrated among many other study populations where feeling understood and supported by healthcare providers was found to have a direct proportional relationship with age (Tavousi et al, 2020; Jarahi, Asadi & Hakimi, 2017). Another salient relationship discovered within the population was that, the mean scores of respondents in domain six increases steadily from ages 20 and above. This means that, the ability to actively engage with healthcare provider increase steadily from age 20 and above. This may be connected to the fact that teenagers are so naïve and inexperience, as such may not be bold to engage health care providers in discussions concerning their health status. Navigating the healthcare system was also found to increase sharply with age between the age of 20-39 before it picked at age of 50 and above. This can be further explained that at ages 20 to 39 years, the young adults become knowledgeable of the importance of their health, as such could navigate the health care system.

Our study also revealed that a greater percentage PLWHIV in the study population had minimal health well-being and the level of well-being was found to be significantly associated with their educational status. These findings were contrary to similar studies in Kogi state, north-central Nigeria as well as Folasire in Ibadan, south western Nigeria, in which the participants reported better health wellbeing (Folasire et al, 2012; Fatiregun et al, 2009). Our findings were in congruence with report from Henan- province, China where better level of wellbeing was recorded among people living with HIV (Shan, Ge, Ming, Wang, Sante & He, 2011). In this study, the minimal wellbeing recorded in the population reflects on the quality of care offered to these patients. Similarly factors like stigma, discrimination, and non-acceptability in the community as well as poor social support networks and lack of other clinical interventions such as psychotherapy might have played a role in lowering the health wellbeing of these patients (Liu, Weber, Robinson, Hu, Jacobson &, Gange, 2006).

Furthermore, certain health literacy domains were found to be associated with the level of wellbeing of the respondents. For example, actively managing ones' health and appraisal of ones' health information were associated with level of well-being. This findings were supported by a previous study in which the researcher reported that active participation of patients in planning of their care as well as understanding their health information have an important role to play in the management of chronic diseases (Coulter, 2012). This report is also synchronized by a systematic review of health literacy and health outcomes

where it was reported that patients with inactive participation in the management of their condition were generally one and half to three times more likely to experience a given poor health and low wellbeing (Kuyinu, Femi-Adebayo, Adebayo, Abdurraheem-Salami & Odusanya, 2020). Several other authors who examined the impact of HL on health wellbeing of the patients with chronic conditions also reported that, patient's access to their health information is a predictor of high wellbeing in the management of long-term conditions (Edwards, Wood, Davies & Edwards, 2012; Coulter, 2007). Indeed, since understanding their health information improves the ability to use health information, it incites patient empowerment and participates in removing the cultural barriers to self-care hence, improving the well-being of the patient (Baumann & Ngoc, 2012).

Ability to actively engage with healthcare provider and understanding health information well enough to know what to do were also found to be associated with the level of well-being of the patients. These findings are in consonant with the report of Palumbo which states that, health literacy enhances the exchange of information between the providers and the recipients of care, thus facilitating both shared clinical decision-making and patient involvement (Palumbo, 2015).

Conclusion

The study identified that, majority of the HIV patients accessing ART in Nasarawa state are within the ages of 20 and 49 years. They are mostly females and farmer who have attained at least primary education. They were found to have average health literacy and minimal health well-being. Certain health literacy domains such as actively managing ones' health, appraisal of ones' health information, ability to actively engage with healthcare provider and understanding health information well enough to know what to do were found to be associated with their level of well-being. We therefore recommend that routine family counseling and strengthening the HIV social-support network should be incorporated into the routine patients' care in HIV treatment centers to improve the health well-being of the patients and work towards the 2030 UNAIDS target of 90–90–90.

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