



HEALTH LITERACY AND HEALTH BEHAVIOUR UNDER ONE HEALTH APPROACH IN TANZANIA: CONNECTING THE CONNECTED OR CONNECTING THE UNCONNECTED?

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ABSTRACT

Globally, health literacy (HL) has been reported to stand as a driver to health behavioural changes. Despite efforts to educate people to enhance the knowledge and skills on health-related matters to improve health literacy, consequently enabling and encouraging individuals to make healthier lifestyle choices, sometimes, there has been notable health impairing behaviours. Definitely, in such circumstances, HL by itself has been observed to fail to drive such behavioural changes. This assumes that there are drivers together with or beyond HL towards behavioural changes. This cross-sectional study assessed HL and its influence on health behaviour (HB) under One Health Approach in Morogoro, Tanzania. A structured questionnaire was employed for data collection from 1440 respondents acquired through a multistage sampling procedure. A tool was developed to assess HL, an index of score gauged HB, and Likert scale was used to assess attitudes towards HB. Data were analyzed using IBM-SPSS v20 software. The study revealed, about one-third of the respondents (32.9%) had adequate HL, (30.8%) moderate HL and (36.3%) with inadequate HL; 40% had health-enhancing behaviours and 60% with health impairing behaviours. A significant association (health literacy*health behaviour, $p=0.000$; was observed. The results further revealed that 30% had unfavourable attitudes towards health impairing behaviours, and attitude was significantly found to associate with behaviours ($p=0.000$). It is concluded that attitudes towards health impairing behaviours affect the way HL can influence HB. This study recommends strengthening efforts to enhance health information dissemination through health education focusing on culture as the context that informs behaviours.

Keywords: Health Literacy, One Health Approach, Health Behaviour, Tanzania

Paper type: Research paper

Type of Review: Peer Review

1. INTRODUCTION

In realization of the global initiatives and the importance of HL towards national development based on its influence on health outcomes, the government of Tanzania has put in place numerous efforts. These efforts have aimed at improving health services and educating people to cultivate the skills and knowledge required to obtain, comprehend and apply health information, to enable and encourage these individuals to make healthier lifestyle choices (to attain positive health outcomes for animals and humans) (URT, 2003a). Despite the efforts, there has been the noteworthy presence of health impairing behaviours (URT, 2007a:11-12; URT, 2007b:34) which at times led to the occurrence of infectious diseases as well as zoonotic ones i.e. Tuberculosis, Rabies, *Taenia solium* infestation, Human Brucellosis etc (for instance see Kassuku *et al.*, 1999; Minja, 2002), and varying preferences for

Tanzanians in seeking healthcare services (Good and Kimani, 1980; McCombie, 2002; URT, 2003b). The linkage (association) between HL and HB has been a focus of discussion in countless studies (URT, 2003a; Dewalt *et al.*, 2004; URT, 2007a; 2007b; Lee *et al.*, 2012) based on the noted connectedness of the two.

It can be observed that the government's efforts (URT, 2003a; 2007a, 2007b) have not realized its intended targets; but what is not empirically known is why these efforts have not realized its intended targets. It remains unclear whether people disregarded information provided through various government's efforts hence didn't change their behaviours or the efforts were not effective enough to bring such behavioural changes. Likewise, it is not known whether adequate health and related information were disseminated in various outlets in educating people to become more health literate, and the extent to which people are health literate in the study area is also not known. Generally, these efforts were expected to facilitate much of health information exchange, hence enabling people to acquire, comprehend and apply such information to promote and retain good health, so that people's HL improved and consequently HBs modified. It is furthermore not known whether it is the kind of attitudes, beliefs, and perceptions people have on certain health-related practices that have impeded behavioural change.

It has always been anticipated that adequate health information can avail knowledge on health-related matters hence leading to educating people to become more health literate. In absence of adequate health information, people are likely to have poor knowledge of the complicated nature of their health and diseases (symptoms, prevention and care) plus the outcomes of health-related practices they run into in their daily lives hence failing to make healthier lifestyle choices. Much as that remains uncontested; but there is much that can account for the differences in health behaviours (Dutta-Bergman, 2005). Lack of clear health communication (Sheridan *et al.*, 2011) is cited as a blockade towards health information contributing to HL hence the behavioural change. Others are arguing knowledge has to be accompanied by attitude, to quote Airhihenbuwa, (2007:177) who argues that "improved knowledge and a change in attitude are the twin engines that generate expected outcomes in behaviour". Kaale and Muhanga (2017) acknowledge the influence of knowledge on behaviours too. Obviously, efforts towards improving health services and educating people to become more health literate in Tanzania (URT, 2003a; URT, 2007a:11-12; URT, 2007b:34) and Africa, in particular, have partly and significantly been relying on the distribution of fact-based pamphlets, the placement of posters, and mass radio broadcasts (Mboera *et al.*, 2007; URT, 2007a; 2007b; Freer, 2015; URT; 2017).

These efforts have always had in mind that an individual is "a rational being that, when given the correct knowledge, will make the rational choice of positive behaviour change" (Freer, 2015:16). It is, however, worthwhile to note that countless aspects can prevent an individual from making a "rational" choice or even receiving the information. Other studies (Freudenberg, 2000; Freer, 2015) have identified the systemic issues of poverty, structural constraints, and culture among such precluding factors. Freer (2015:16) argues that "culture is the context that informs behaviours". Airhihenbuwa (1995, 2007) points out that to effectively address health behaviour within an African context, understanding health within the cultural identity of Africans such that any education intervention is anchored in African ways of knowing is inevitable. The PEN-3 model assumes that health beliefs and actions can be best understood in the context of history, culture, and politics (Airhihenbuwa, 1995; 2007). Obviously, from the review, it can be concluded that there are health behavioural changes drivers together with or beyond knowledge. In this context, then, this study investigated these aspects to provide empirical answers hence filling the information gap. It is obvious that given the arguments raised from the literature there is a possibility of that HL given such circumstances failing to connect or influence health behaviour in the community. Existing literature has scantily documented on the connections existing between HL and HB in Tanzania. This is an indication that the reality concerning the influence of HL on HBs in the interface of the environment,

humans, and animals is not empirically known, hence it is furthermore not known how the observed HBs connects to the levels of HL. It is worthwhile to note that no comprehensive studies have been undertaken on this aspect in Tanzania. This study, therefore, fills the information gaps existing on the connections existing between HL and HBs by providing an empirical explanation on the same under OHA.

2. THEORETICAL APPROACHES TO THE STUDY

This study is theoretically guided by PEN-3 model (Airhihenbuwa, 1995:29-34) which generally recognizes the role of health education in empowering People, Extended Family and Neighborhood (PEN) to make informed health decisions appropriate to their roles in their families and communities under Cultural identity domain. Relationships and Expectations is another domain of this model which is comprised of Perceptions, Enablers and Nurturers (PEN). Perceptions embrace the attitudes, knowledge, beliefs, and values, within a cultural context, that can enable or deter community, family, and personal motivation to change. The model assumes that there are enablers which are societal, cultural, systemic, or structural influences which may enhance obstacles to change, these may include the availability of resources, accessibility, skills, referrals, government officials, employers, and type of services. Nurturers denote the degree to which health beliefs, actions, and attitudes are mediated and influenced, or nurtured, by kin, extended family, peer, friends, and the community. PEN-3 model also acknowledges Cultural Empowerment reflected in Positive Behaviour, Existential Behaviour and Negative Behaviours (PEN): Positive Behaviours are based on health beliefs and actions that are recognized to be useful hence should be encouraged. Affirmation of such behaviours is critical to program success and sustainability. Existential Behaviour denotes cultural practices, beliefs, and/or behaviours that are indigenous to a group with no harmful health consequences, and for that matter then should not be targeted for change but also should not be accused of program failure. Negative behaviours are health beliefs and actions which are harmful to health. Health providers must examine and understand these in their historical, cultural, and political context prior to attempting to change them. This theory goes beyond just valuing the influence of health information hence health knowledge on health behavioural changes through health education by looking at cultural, historical, and political context. This model identifies other important aspects which can impede HL to influence behavioural changes. It is in this context that study investigated on the association existing between HL and HB by analyzing the other aspects which could influence HB.

3. MATERIALS AND METHODS

Morogoro municipality and Mvomero districts were the research sites for this study. The area is found in Morogoro region in Tanzania, in terms of population, Morogoro municipality and Mvomero districts have 315,866 and 312,109 people respectively (Tanzania NBS, 2013). The research sites were chosen simply because these districts are found where numerous incidences of animals and humans interfaces have been reported. The area accommodates a Maasai origin pastoral community; and borders Mikumi National Park. Given this context, this area is regarded to fall under higher risk, much as there is an obvious likelihood of the occurrences of certain health behaviours, as it has been noted that the area provided an obvious interaction between human and animals. Health risks incidences are also reported in the area by Karimuribo, *et al.*, (2005).

The study employed a cross-sectional design to collect quantitative and qualitative data. Data were collected through a structured questionnaire guide administered through a Computer Assisted Personal Interviewing (CAPI) electronic platform. This study employed a multi-stage sampling procedure, involving four (4) stages (for the choice of districts, wards, villages/streets, and HHs) to recruit respondents from 4 purposively selected wards. Two (2) villages/streets were chosen from 4 wards by using simple random sampling. These are the villages/streets that were involved in animal keeping and selling other livestock products. The local leaders took part in drawing the sampling frame.

For sample size estimation, a 95 per cent confidence interval (CI), a margin of error of 5percent, and a design effect of 1.5 were assumed. Design effect was used since the multistage sampling method was employed. A minimum adequate sample size was calculated based on the statistical estimation method by Kelsey *et al.* (1996). A sample size of 1440 respondents was determined by using the formulae:

$$s = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)} \dots \dots \dots (1)$$

Where:-

s = required sample size.

χ^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

IBM-SPSS v20 was used to compute frequencies, chi-square, mean and maximum scores and coefficients correlation. All statistical tests were considered significant at p-value= <0.05.

4. MEASUREMENT OF VARIABLES

4.1 Health Literacy

European HL Survey methodological aspects (HLS-EU, 2012: 4) were adapted in this study to measure HL. Health Literacy in this study was measured by asking the respondents: *On a scale from very easy to very difficult, how easy would you say it is to: i.e (Find information about symptoms of illnesses that concern you?).* The questions asked echoed health-relevant areas (health promotion, disease prevention, and health care) and information processing stages (acquisition, comprehension, appraising, application) related to health-relevant decision-making and tasks on health and other associated aspects under the interface of the environment, animals, and humans. A context-specific HL assessment tool was developed and employed to assess HL under OHA, a matrix which measured HL under OHA through a 4- point self-reporting scale (very easy, easy, difficult, and very difficult) which simply measured the perceived difficulty of selected OH relevant tasks. To measure HL, index score was created with the following distribution of points: “very easy” response (4 points), “easy” response (3 points), “difficult” response (2 points), and “very difficult” response (1 point). This was followed by the computation of scores and categorization of the scores as indicated in Table I. Similarly, Gazmararian, *et al.*, (2003) have employed the categorization in another study. Using IBM-SPSS functions the scores were cut into 3 equal groups to represent HL categories into IHL, MHL and AHL. Percentiles values were used to categorize HL. The European HL Survey was based on human health aspects alone. In this study, the model was modified by adding variables related to humans, animals and the environmental health to fit in the context of OHA. Table 1 summarizes categorization of HL.

Table 1: HL Categories

HL Category	Scores
Inadequate Health Literacy (IHL)	below the scores of 211.00
Marginal Health Literacy (MHL)	between the scores of 211.00 and 261.00 scores
Adequate Health Literacy (AHL)	the scores above 261.00

4.2 Health Behaviour

Literature (Muma, *et al.*, 2007; Munyeme *et al.*, 2008; Oloya *et al.*, 2008; Ribbands 1946; Vundule & Mharakurwa 1996; Kazwala *et al.*, 1998; Fynn & O'Connor 2000; Meslin, *et al.* , 2000; Oberlander & Elverdan 2000; Minja *et al.*, 2001; Nuwaha, 2002; Siamudaala, *et al.* , 2003; Keiser *et al.*, 2005; Mukabana *et al.*, 2006; Munang'andu *et al.*, 2006; Cleaveland *et al.*, 2007; Opiyo *et al.*, 2007; Pfukenyi, *et al.*, 2007; Hang'ombe *et al.*, 2012; Mwacalimba., 2013) were reviewed to capture health behaviours and practices reflected in the interface of animals, humans and the environment.

To investigate individuals' HB in this study, individuals were asked: "Have you ever in the past three (3) months i.e. consumed raw meat"?. The behaviours which were Identified were measured as dichotomies: with a "Yes/No response." The implication here is that the respondent had a choice between two mutually exclusive and exhaustive alternatives: performing the behaviour or not performing it. In this study, respondents were to indicate if they have ever involved in the identified 38 health impairing practices/habits by saying "Yes or No". To measure behaviours, an index score was constructed with "No responses" (1 point) and "Yes responses" (2 points) respectively. Since the presented practices/behaviours were health impairing, this implies that one who scores higher is the one with lower engagement in HEBs and vice versa. In a study by Weinstein (1993) similar approach has been employed.

To categorize HB, the mean score was computed and the scores below the mean value signified the low level of involvement in HIPs, therefore, revealing HEBs, whereas all those scores above the mean implied a high level of involvement in HIPs hence exhibiting HIBs. Using IBM-SPSS (v20) under percentiles values; HB scores were categorised into Health Impairing Behaviours (HIBs) (the scores above 23.45) and Health Enhancing Behaviours (HEBs) (below the scores of 23.45).

4.3 Attitudes towards Health Behaviours

Attitudes of individuals towards HIBs were gauged using thirty eighty (38) statements describing various practices related to OHA identified through literature review. To assess the attitudes of respondents towards HIBs, the Likert scale was employed. Of the 38 statements administered, half of the statements had negative connotations whereas the remaining had positive connotations. The weighting of scores for respective statements is indicated in Table 2. From the statements, an index score was constructed to measure the attitude of respondents towards HBs.

Table 2: Weight of variables in measuring Attitudes towards HBs

Type of statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Weight of positive statements	5	4	3	2	1
Weight of Negative statements	1	2	3	4	5

To categorise attitudes towards OHA, IBM-SPSS (v20) was employed to cut the scores into 3 equal groups, as presented in Table 3.

Table 3: Attitudes towards Health Behaviours

Scores	Attitudes		
	unfavourable (negative)	neutral (undecided)	favourable (positive)
Scores	below 112	112 to 117	above 117

5.0 RESULTS AND DISCUSSION

5.1 Socio-Demographic Characteristics of the Respondents

The results reveal that 47.9% of the respondents were males and 52.1% females, in terms of age, 42.1% were between 21 to 39 years, 26.3% (40 to 49 years), 17.1% (50-59 years), 10.7% (60-69 years) and 3.8% (above 70 years). It was revealed that the mean age was 43.7 years, and the highest age and the lowest age were 21 and 72 respectively. In terms of education, 39.2% of the respondents had no formal education, 2.5% (universal adult education), 30.0% (primary school education), 8.8% (secondary education), 10.4% (post-secondary/vocational education), and 9.2% (graduated from universities). The results further reveal that 57.5% of the respondents were married, 1.7% (separated), 30.4% (single), 5.4% (widow), 2.5% (widower), 0.8% (cohabiting), and 1.7% (too young to marry). The mean household size was 5 members, the lowest household size (minimum) with 1 member and the highest household size (maximum) with 10 members. Table 4 presents the results in details.

Table 4. Socio-demographic characteristics of the respondents (n=1440)

Variable	Categories	Percent (%)
Age in years	21-39	42.1
	40-49	26.3
	50-59	17.1
	60-69	10.7
	> 70	3.8
Level of Education	No formal education	39.2
	Universal adult education	2.5
	Primary school	30.0
	Secondary school	8.8
	Post-secondary /vocational	10.4
	University	9.2
Sex	Male	47.9
	Female	52.1
Marital status	Never married/Single Married	30.4
	Separated	57.5
	Widow	1.7
	Widower	5.4
	Cohabiting	2.5
	Too young to marry	0.8
Household size	1-3	1.7
	4-7	21.7
	> 8	65.9
		12.4

5.2 Health literacy under OHA

The results in Table 5 show the average score being 261.9 (95% CI: 257.6 to 266.4) with maximum and minimum scores being 501.0 and 141.0 respectively, and a Standard deviation of 85.0 (95% CI: 81.4 to 88.3). Table 4.2 shows that 36.3 per cent (95% CI: 33.7 to 38.9) of the respondents had IHL, 30.8 per cent (95% CI: 28.4 to 33.3) with MHL, and 32.9 per cent (95% CI: 30.3 to 35.3) had AHL.

Table 5: Health Literacy categories (n=1440)

HL Categories	Frequency	%	95% Confidence Interval	
			Lower Bound	Upper Bound
Inadequate Health Literacy (IHL)	522	36.3	33.7	38.9
Marginal Health Literacy (MHL)	444	30.8	28.4	33.3
Adequate Health Literacy (AHL)	474	32.9	30.3	35.3
Total	1440	100.0		

The results indicate that over one third making the majority of the respondents had IHL, and below one third had AHL. The findings from this study are similar to findings from other studies conducted in various parts of the world. The trend indicates that IHL is reported to be a common occurrence throughout the world. Both low and limited HL levels have been observed to be common even in economically advanced countries with strong education systems (Gazmararian, *et al.*, 1999b; Sørensen *et al.*, 2015), though the situation is reported to be worse in the developing part of the world (Muhanga and Malungo, 2018a; 2018b).

A popular study known as “The European Health Literacy Survey (HLS-EU)” conducted in eight European countries revealed that 12% of all respondents had inadequate general HL and with 35 per

cent having problematic HL. It was further observed in HLS-EU that the problem of limited HL in Europe was not just a problem of a minority of the population (Sørensen *et al.*, 2015, HLS-EU CONSORTIUM, 2012). A similar observation has been made by WHO (2013) which reports that nearly half of all Europeans have inadequate and problematic HL skills. The situation seems not to be too well in the United States (US) where it is reported that an approximately of 80 million adults to have limited HL, with more than one-third of respondents (36 per cent) who scored in the lowest two categories (“basic” and “below basic”), (Kutner, *et al.* 2006). Another study conducted in the US also reports that about 50 per cent of all adults "have difficulties understanding and acting upon health information" (IOM, 2004). It is also reported that 60 per cent of the Australian population has scored below a level regarded as optimal for health maintenance (IOM, 2004).

5.3 Health Behaviour under OHA

The results in Table 6 indicate that the mean score was 23.45 (95% CI: 23.2 to 23.7); the minimum and maximum scores were 12 and 30 respectively while the Standard Deviation was 4.63 (95% CI: 4.47 to 4.78). The results in Table 6 reveal that majority (60 per cent) (95% CI: 57.5 to 62.5) of the respondents interviewed had exhibited HIBs while only 40% (95% CI: 37.5to 42.5) had HEBs.

Table 6: Categories of Health Behaviours (n=1440)

	Frequency	Per cent	95% Confidence Interval	
			Lower Bound	Upper Bound
HEBs (Low Health Impairing practices)	576	40.0	37.5	42.5
HIBs (Low Health Enhancing practices)	864	60.0	57.5	62.5
Total	1440	100.0		

The findings from this study are similar to what has been also observed by other studies conducted in Tanzania (see Kassuku, *et al.*, 1999; Cleaveland., *et al.*, 2002; Minja, 2002; URT, 2003a;), which reported occurrences of HIBs which from time to time have resulted into a higher incidences of infectious diseases (including zoonotic ones i.e. tuberculosis, rabies, *taenia solium* infestation, human brucellosis etc.).

5.4 Attitudes towards Health Impairing Behaviours under OHA

The mean score on attitudes towards HIBs was 114.52 (95% CI: 114.1 to 114.9), the minimum and maximum scores were 103 and 131 respectively with the Standard Deviation of 6.78 (95% CI: 6.5 to 7.0). The overall results for attitudinal scores presented in Table 7 indicate that 30 per cent (95% CI: 27.6 to 32.4) had unfavourable (negative) attitudes towards, while 35 per cent (95% CI: 32.6 to 37.5) had favourable (positive) attitudes and the remaining 35 per cent (95% CI: 32.5 to 37.4) had neutral attitudes towards HIBs.

Table 7: Categories of Attitudes towards HIBs (n=1440)

	Frequency	%	95% Confidence Interval	
			Lower Bound	Upper Bound
Favourable (positive) attitude	504	35.0	32.6	37.5
Neutral (undecided) attitude	504	35.0	32.5	37.4
Unfavourable (negative) attitude	432	30.0	27.6	32.4
Total	1440	100.0		

The findings from this study comply with the Theory of Planned Behaviour (TPB) (Ajzen, 2002) which hypothesizes that a positive or negative evaluation of a particular behaviour and beliefs about the

outcome of the behaviour is what directs behaviours; and behavioural intentions are the outcome of a combination of several beliefs. It can be observed from the findings of this study that individuals' attitudes towards HIBs were matching with their HBs, as those who had negative attitudes (unfavourable) towards HIBs were also exhibiting HEBs and those who had positive attitudes (favourable) exhibited HIBs. This implies that attitude is linked to behaviour. This reflects a match between an individual's evaluation of certain behaviour and performance of such behaviours.

Similar to the findings of this study are findings from previous studies by Bentler and Speckart, (1981); Ajzen and Timko (1986) Ajzen and Fishbein (2005) which acknowledge the existence of an association between attitudes and health behaviour. PEN -3 model views perceptions as comprised of the knowledge, attitudes, values, and beliefs, within a cultural context, that may facilitate or hinder personal, family, and community motivation to change (Airhihenbuwa, 2007)

5.5 Linkage (association) between HL, and HB under OHA

Pearson's correlation coefficient (Product Moment Correlation Coefficient) was employed to determine the association (relationship) between HL scores and HB scores. The results for Pearson's correlation coefficient are presented in Table 8.

Table 8: Association between HL Scores and HB Scores (n=1440)

		HL Score	HB Score	
Health Literacy Score	Pearson Correlation	1	-.631**	
	Sig. (2-tailed)		.000	
	N	1440	1440	
	Bootstrap	Bias	0	.000
		Standard Error	0	.015
		95% CI	Lower	1
	Upper		1	-.600
	Health Behaviour Score	Pearson Correlation	-.631**	1
		Sig. (2-tailed)	.000	
		N	1440	1440
Bootstrap		Bias	.000	0
		Standard Error	.015	0
		95% CI	Lower	-.659
Upper			-.600	1

The results in Table 8 indicate a strong, negative correlation between the two variables, $r = -.63$, $N = 1440$, $p < 0.000$, with high scores on HL associated with lower scores on health impairing behaviours/practices. This means the higher the HL scores the lower the scores on HIB (hence HEBs). A chi-square test of independence was further employed to test the association between HL and HB involving HL levels and HB categories. Table 9 presents cross-tabulation results indicating the association between HL levels and HB categories.

Table 9: HL Levels * HB Categories Cross tabulation (n=1440)

		HB Categories		Total
		HEB (Low Health Impairing practices)	HIB (Low Health Enhancing practices)	
IHL Level	Count	36	486	522
	% within HL Levels	6.9%	93.1%	100.0%
	% within HB Categories	6.2%	56.2%	36.2%
	% of Total	2.5%	33.8%	36.2%
MHL Level	Count	144	300	444
	% within HL Levels	32.4%	67.6%	100.0%
	% within HB Categories	25.0%	34.7%	30.8%
	% of Total	10.0%	20.8%	30.8%
AHL Level	Count	396	78	474
	% within HL Levels	83.5%	16.5%	100.0%
	% within HB Categories	68.8%	9.0%	32.9%
	% of Total	27.5%	5.4%	32.9%
Total	Count	576	864	1440
	% within HL Levels	40.0%	60.0%	100.0%
	% within HB Categories	100.0%	100.0%	100.0%
	% of Total	40.0%	60.0%	100.0%

$\chi^2 = 623.420, p < 0.001, \text{Phi} = 0.658$

The results from Table IX indicate that 93.1 per cent of the respondents who were interviewed who had HIB (Low Health Enhancing practices) also had IHL, while only 6.9 per cent of those who had HEBs were found to have IHL. The table further indicates that the majority of those who were reported to have HEBs (83.5 per cent) were found in the AHL category and only 16.5 per cent under HIBs.

Table 9 also presents chi-square results on the association between HL levels and HB categories, the results reveal that $\chi^2 = 623.420, p < 0.001$. This is an indication of a significant association between HB categories and HL levels. Obviously, there is an existence of levels of HL which are considerably different for those individuals with HEBs and HIBs. This implies the existence of an association between HL levels and HB. The phi coefficient in this study is 0.658 based on Cohen's 1988 criteria of 0.50 for large effect, 0.30 for medium effect and .10 for a small effect. This indicates that the strength of association between the variables (HB categories and HL levels) is very strong.

Tombrink and Vanasse (2013: 2) argue that through "health literacy it is possible to reframe the different components of health knowledge in a way that can lead to a new understanding of health behaviour". Sørensen *et al.*, (2012) contend that being health literate means placing one's health and that of one's family and community into context, understanding which factors are influencing it, and knowing how to address them. An individual with an adequate level of HL can take responsibility for one's health as well as one's family health and community health. These arguments suggest that a health literate individual given the information obtained, communicated, processed, and understood there is a greater chance of shaping his/her health-related practices/behaviours to achieve good health. Similar findings are reported from a study by Fleary *et al.*, (2018) which found a meaningful relationship between health literacy and adolescents' health behaviours. In a study by Sun *et al.*,

(2013) on Determinants of Health Literacy and Health Behaviour regarding Infectious Respiratory Diseases, HL has been observed to be a direct influencing factor of health behaviour ($\beta = 0.101$). Other studies (Speirs, *et al.*, 2012; Adams, *et al.*, 2013; Geboers; *et al.*, 2014; Husson, *et al.*, 2015) have also found an association between IHL with unhealthy behaviours.

5.6 The association between Attitude towards HIBs and Health Behaviours Categories

The results in Table 10 indicate that HIBs (Low Health Enhancing practices) were higher among those with favourable attitudes towards health impairing behaviours/practices constituting 45.8 per cent within the HIBs category, while HEBs (Low Health Impairing practices) were higher among respondents with unfavourable attitudes towards health impairing behaviours/practices constituting 56.2 per cent within the HEBs category.

Table 10: Attitude* Health Behaviours Categories Cross tabulation (n=1440)

Groups of attitude		Health Behaviours Categories		Total
		HIBs	HIBs	
Favourable (positive) attitude	Count	108	396	504
	% within Groups of attitude	21.4%	78.6%	100.0%
	% within HB Categories	18.8%	45.8%	35.0%
	% of Total	7.5%	27.5%	35.0%
Neutral (undecided) attitude	Count	144	360	504
	% within Groups of attitude	28.6%	71.4%	100.0%
	% within HB Categories	25.0%	41.7%	35.0%
	% of Total	10.0%	25.0%	35.0%
Unfavourable (negative) attitude	Count	324	108	432
	% within Groups of attitude	75.0%	25.0%	100.0%
	% within HB Categories	56.2%	12.5%	30.0%
	% of Total	22.5%	7.5%	30.0%
Total	Count	576	864	1440
	% within Groups of attitude	40.0%	60.0%	100.0%
	% within HB Categories	100.0%	100.0%	100.0%
	% of Total	40.0%	60.0%	100.0%

$\chi^2 = 320.357, p < 0.000, \phi = 0.472$

Table 10 also presents chi-square results on the association between attitudes and HB categories. A chi-square test of independence indicates a significant association between attitudes towards HIBs and HB categories $\chi^2 (2, n=1440) = 320.357, p = 0.000, \phi = 0.472$. The phi coefficient in this study is 0.472 based on Cohen's 1988 criteria of .10 for a small effect, .30 for medium effect and .50 for large effect. This indicates that the strength of association between the variables (attitudes and HBs) is strong. The findings confirm what PEN-3 model which claims that attitudes, knowledge, beliefs, and values, within a cultural context can enable or deter community, family, and personal motivation to change. In this case, the observation has been that positive attitudes towards HIBs were found to associate with performing such behaviours.

6. CONCLUSION

It is concluded that that HL and HB may not necessarily directly influence each other as there are numerous factors which have moderating effects on the two. This is simply that the influence of HL on HB depends very much on these other factors, hence there are instances where health literacy may not be connecting to HB in a case where these factors do not play its expected roles. This assumes that

there are drivers together with or beyond HL towards behavioural changes. In this study attitudes towards HIBs have been found to influence HBs beyond ones HL.

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