

## HEALTH LITERACY AND ITS CORRELATES IN THE CONTEXT OF ONE HEALTH APPROACH IN TANZANIA

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### Abstract

*Health literacy is an important predictor of health outcomes, health care costs and utilization, yet most countries, Tanzania inclusive, lack health literacy measurements in their health datasets. A cross-sectional study was conducted in Morogoro urban and Mvomero districts in Morogoro, Tanzania to assess health literacy and its correlates in the interface of humans, animals and the environment. The sample comprised of 240 respondents was obtained through a multistage sampling procedure. A structured questionnaire administered through a Computer Assisted Personal Interviewing (CAPI) electronic platform was used to collect data. Health literacy was measured using a context specific One Health Literacy Assessment Tool (OHLT) developed to capture health related aspects reflecting the interactions of humans, animals and the environment. The study used IBM-SPSS (v20) and Gretl software to analyse quantitative data. The results revealed that 36.3% of the respondents had Inadequate Health Literacy, followed with Marginal Health Literacy at 30.8% and Adequate Health Literacy standing at 32.9%. Pearson coefficient correlation revealed health literacy correlating to group of attitudes ( $r=0.135$ ,  $p<0.01$ ), levels of engagement in health-related discussion ( $r=0.609$ ,  $p<0.05$ ), health behaviours categories ( $r=-0.648$ ,  $p<0.05$ ) and category of information seeking ( $r=0.753$ ,  $p<0.05$ ). Efforts should be made by the government and non-governmental organizations to promote health literacy in the context of One Health Approach through mass awareness given its importance towards realization of optimal health for humans, animals and the environment.*

**Keywords:** *Health literacy, Correlates, One Health Approach, Computer Assisted Personal Interviewing, One Health Literacy Assessment Tool*

### 1.0 INTRODUCTION

#### 1.1 Background Information and Problem Statement

It is all over the literature (World Bank, 1993; WHO, 2010; WHO, 2012; Lennox and Ehrenpreis, *n.d*) that good health is a keystone of development in any society, as it is obvious that health status of a society is likely to impact all other sectors in the society in a given polity (politics, society and the economy inclusive) (Ainsworth and Over, 1994; Achmat and Cameron, 1995; Baruch and Clancy, 2000; Sørensen, *et al.*, 2015). Good health boosts labour productivity, educational attainment and income, and so reduces poverty (Udoh and Ajala, 2001; Bloom, *et al.*,

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2004). Likewise, the social aspects, politics and the economy of a particular community can impact health status in a given society respectively (Sayah and Williams, 2012; Edwards *et al.*, 2012). Ill-health and diseases are evidently barriers to economic growth and subsequently to national development (Bloom and Canning, 2000; Bloom *et al.*, 2001; WHO, 2001; Strittmatter and Sunde; 2011; WHO *et al.*, 2013). Achieving development goal definitely calls for improving health status of a nation's population, however it is obvious that there are a number of challenges in attaining good health (Ratzan *et al.*, 2000; Byrne, 2004; Mamdani and Bangser, 2004; Sanders and Chopra, 2006; Kaseje, 2006; Association of Chartered Certified Accountants, 2013).

Health Literacy (HL) is one of such challenges towards attaining good health (Paasche-Orlow and Wolf, 2007; Muhanga and Malungo, 2017). HL is an important predictor of health outcomes, health care costs and utilization, and when it is limited impacts negatively a person's ability to access and use health care, to interact with providers, and to care for oneself (Weiss, *et al.*, 1992; Parker, *et al.*, 1995; Baker *et al.*, 1996; Ratzan and Parker, 2000; Gazmararian, *et al.*, 2003; Berkman, *et al.*, 2004; DeWalt *et al.*, 2004; Nielsen-Bohlman, *et al.*, 2004; Sudore *et al.*, 2006; Paasche-Orlow and Wolf, 2007; AHRQ, 2007; WHO, 2009; TARSC, 2009; Berkman *et al.*, 2010; U.S. Department of Health and Human Services, 2011; Muhanga and Malungo, 2017 ). It is worth noting that at the core of HL is an attempt to improve people's access to health information and their capacity to use it effectively (Muhanga and Malungo, 2017).

It is apparent that for good health to be attained, HL has to be taken into the context of the fact that there is an inextricable link between human, animal and environmental health. This is due to the fact that there are ways that livestock production, intensive animal production practices, exploitation of wildlife, wildlife trade, increasing contact of wildlife and livestock, and environmental degradation can have consequences hence easily leading to transmission of infectious diseases (Jones *et al.*, 2008; Kayunze *et al.*, 2012; Mumba *et al.*, 2014). For optimal health for animals, humans and the environment to be attained, it remains imperative for veterinarians, human health and other sectors professionals to work in close collaboration. It requires at the same time a high level of understanding on HL under One Health Approach promoted among people to enable them to maintain good health.

Several studies have measured HL (Baker, *et al.*,2002; Gazmararian, *et al.*,2003; Wolf, *et al.*, 2010; Edwards, *et al.*,2012; Sorensen, *et al.*,2012; Sun, *et al.*, 2013; Sørensen, *et al.*,2015); however, mostly based on developed world; and very few from developing world (Stone *et al.*, 2011; ) but all have not taken into account the fact that attaining optimal health for humans, animals and the environment calls for collaborative efforts between humans, animals and the environmental professionals plus understanding of humans, animals and the environment interactions and its consequences on health. It is apparent that there is no empirical evidence in the literature on having HL researched and documented adequately in Tanzania, what exists is very limited, i.e. Stone *et al.*, (2011) who dealt with evaluation of the utility of IEC materials for increasing patient HL and how patients perceive such materials on HIV/AIDS. Despite having very limited studies on HL still none of few available have focused on OHEA. It is also vivid that despite the government of Tanzania's efforts to improve health services and educate people to

become more HL, i.e. by cultivating knowledge and skills to access, understand and use health information (HI), towards healthier lifestyle choices to achieve positive health outcomes for both humans and animals (URT, 2003a), there are still notable existence of health impairing behaviours (HIBs). These HIBs have resulted into a higher prevalence of infectious diseases, including zoonotic ones; and varying preferences in terms of seeking healthcare services ranging from traditional healers, self-treatment, and no treatment instead of going to hospital (Good and Kimani, 1980; Atkinson *et al.*, 1999; McCombie, 2002; URT, 2003b). It is against this background that this study empirically assessed HL and its correlates under humans, animals and environment interface.

### **1.2 Materials and Methods**

This paper results from a study conducted in Morogoro Municipality and Mvomero districts both located in Morogoro region in Tanzania. According to Tanzania National Bureau of Statistics (2013), Morogoro Municipality and Mvomero districts have a population of 315,866 and 312,109 respectively distributed in 19 and 17 administrative wards. The choice of this research site is based on the fact that good incidences of interactions of humans and animals plus very diverse sociocultural and economic backgrounds of the inhabitants are best captured in the selected area. The selected area is a home to a pastoral community of Maasai origin that is also bordered by Mikumi National Park, hence a higher level of interaction between human and animals. A previous study by Karimuribo *et al.* (2005) has also identified presence of health risks in the area.

A cross-sectional design was employed whereby both qualitative and quantitative data were collected at a single point in time for primary and secondary data. This design is economical in terms of time, financial resources and nature of the study objectives (Kothari, 2004). A structured questionnaire guide administered through a Computer Assisted Personal Interviewing (CAPI) electronic platform was used to collect data. A multi stage sampling procedure was employed, with four (4) stages (for the choice of districts, wards, villages/streets, and HHs) to obtain two hundred and forty (240) respondents from four (4) purposively selected wards, followed by choice of two (2) villages/streets from four (4) wards and thirty (30) respondents through simple random sampling from each village/street where animal keeping and related activities plus evidence of selling livestock products are found. The sampling frame was drawn with assistance of local leaders. The sample size on each village/street is justified by Bailey (1994) who argues that a sub sample of thirty (30) respondents is regarded as the bare minimum for studies in which statistical data analysis is to be done regardless of the population size. IBM-SPSS version 20 and Gretl software were used to compute frequencies, chi-square, correlation coefficients, mean and maximum scores.

### **2.0 MEASUREMENT OF HEALTH LITERACY**

In order to measure HL, this study adapted methodological aspects from a model used in European HL Survey (HLS-EU, 2012: 4). This model based on human health aspects alone. For the purpose of this study the model was modified to fit in the context of One Health Approach. HL was measured by asking 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 items asked in these questions reflected on three health relevant areas (health care, disease prevention, health promotion) and four (4) information processing stages (access, understand, appraise, apply) related to health relevant decision-making and tasks on health and other associated aspects under the interface of humans, animals and the environment. This led to development of a context specific HL assessment tool to assess HL under OHEA, a matrix measuring HL under OHEA on a four (4) point self-report scale (very easy, easy, difficult, and very difficult) to measure the perceived difficulty of selected one health relevant tasks. An index was developed based on activities reflecting One Health relevant areas, information processing stages related to health relevant decision-making and tasks on health as well as other associated aspects under the interface of humans, animals and the environment. An index of score was constructed to measure HL by assigning four (4) points to “very easy” response, three (3) points to “easy” response, two (2) points to “difficult” response, and one (1) point to “very difficult” response. Using IBM-SPSS (v20) HL scores were computed and cut into 3 equal groups. The scores were then categorized into Inadequate Health Literacy (IHL) (below the scores of 211.0), Marginal Health Literacy (MHL) (between 211.0 and 261.0 scores) and Adequate Health Literacy (AHL) (the scores above 261.0). A similar categorization has also been employed by Gazmararian, *et al.* (2003).

### **3.0 RESULTS AND DISCUSSION**

#### **3.1 Socio-demographic characteristics of the respondents**

Socio-demographic characteristics of the respondents were found to be very important variables in most behavioural and attitudinal studies. Information on some socio-demographic characteristics namely age, sex, education level, marital status and household size were obtained in order to establish the distribution of respondents as well as to establish the background variables to be used in linking the socioeconomic variables and health literacy. The summary on socio-demographic characteristics of the respondents is presented in Appendix 1). The results reveal that 42.1% of the interviewed respondents were aged between 21 to 39 years, 26.3% were between 40 to 49 years while 17.1% were between 50-59 years, while 10.7% were between 60-69 years and 3.8% were above 70 years. The average age was 43.7 years, and the highest age and the lowest age were 72 and 21 respectively.

The results indicate that the majority of respondents interviewed 47.9% comprised of men and 52.1 % were women. Slightly more than one-third (39.2%) of the respondents had not gone to school at all, 2.5% had adult education, whereas 30.0% completed primary school education, 8.8 % had attained secondary education, 10.4% had post-secondary/vocational education and 9.2% had graduated from universities. The results further indicate that the majority of the interviewed respondents, 57.5% were married, while only 1.7% were separated and 30.4% were never married/single. Others were 5.4 %, 2.5%, 0.8% and 1.7% who were widow, widower, cohabitating and too young to marry respectively. In terms of household size (total number of household members) the mean household size was 5 members with lowest household size (minimum) with 1 member and the highest household size (maximum) with 10 members.

### 3.2 Assessment of HL under One Health Approach

HL was measured using a developed context specific One Health Literacy Assessment Tool (OHLT) to capture health related aspects reflecting the interactions of humans, animals and the environment. The results for HL assessment indicate that the mean score was 261.9 while the maximum and minimum scores were 141.0 and 501.0 respectively. Table 2 presents HL results into categories, the results indicate that 36.3% of the respondents had IHL, 30.8 % with MHL and 32.9% had AHL. This implies that the majority of the respondents had IHL.

**Table 1: Health Literacy categories (n=240)**

Health Literacy Categories	Frequency	Percent
Inadequate Health Literacy (IHL)	87	36.3
Marginal Health Literacy (MHL)	74	30.8
Adequate Health Literacy (AHL)	79	32.9
Total	240	100.0

### 3.3 HL based on socio-demographic characteristics

There is evidence on socio-demographic characteristics related variables to have predictive effects on other dependent variables in other studies (de Smet *et al.*, 2005; Leka and Jain, 2010; Rauschenbach and Hertel, 2011; European Agency for Safety and Health at Work, 2012; Marinaccio *et al.*, 2013; Rivera-Torres, 2013; Muhanga, 2017). This study analysed the influence of socio-demographic variables on health literacy. The results in Table 3 indicate that AHL was observed among category comprised of the “not gone to school at all” at 34.2%, followed by those who had primary school education at 29.1%, 16.5% with post-secondary education, then those with secondary school education at 11.4% and those with university education forming 8.9%, the lowest in the AHL category. The results reveal no association between educational attainment and the level of HL. This finding is supported by a study by Schrauben and Wiebe (2015) who found that a high level of education does not necessarily ensure a high level of HL. Thus, high educational attainment seems not to be the prime force driving high HL.

For the purpose of reporting age of the respondent, this study adopted an approach employed in a study by Kogan (1979) which categorized age into adolescents (18-21 years), young (22-28 years), middle aged (29-38 years), elderly (39-55 years) and aged adults (56-76 years). The results indicate that HL is lower among older individuals, with 40.2% of those who had IHL falling under the elderly age category, followed by 24.1% from the middle aged category, and 21.8% from the aged while young had 13.8%, with no adolescents were found to have IHL. These findings are in line with those by Williams, *et al.*, (1995), Gazmararian, *et al.*, (1999), and Weiss, *et al.*, (1992) which also reported lower health literacy amongst older individuals. The results from this study reveal that more females (56.3%) had IHL than males (43.7%), while it was observed that more males (53.2%) were having AHL than females (46.8%). This implies that there is a difference in terms of HL levels between males and females. Other studies (Lee, *et al.*, 2012; Foundation House, 2004) also reported an association between sex and HL. AHL was observed among married respondents at 65.8% in the category followed by never married (singles) at 22.8%, while widowers were at 1.3% and widows and cohabitating were 8.9% and

1.3% respectively. It has been observed by another study ( Liu, *et al.*, 2015 ) that the independent influencing factors of health literacy were education, race, occupation, household income, age and marital status ( $P < 0.05$ ). The results on HL Levels based on socio-demographic characteristics of the respondents are presented in Appendix 2.

### 3.4 Correlates of Health Literacy

A bivariate Pearson correlation was used to analyse the strength and direction of linear relationships between HL and some other continuous variables under the study. A correlation expresses the strength of linkage or co-occurrence between two variables in a single value between -1 and +1. This value that measures the strength of linkage is called correlation coefficient, which is represented typically as the letter  $r$ . A positive  $r$  value expresses a positive relationship between the two variables (the larger A, the larger B) while a negative  $r$  value indicates a negative relationship (the larger A, the smaller B). A correlation coefficient of zero indicates no relationship between the variables at all. However correlations are limited to linear relationships between variables. Even if the correlation coefficient is zero, a non-linear relationship might exist. The results from Pearson correlation indicate that HL is significantly associated with group of attitudes ( $r=0.135$ ,  $p<0.01$ : the higher HL, the positive attitudes HEB), levels of engagement in health related discussion ( $r=0.609$ ,  $p<0.05$ : the higher engagement, the higher HL), health behaviours categories ( $r=-0.648$ ,  $p<0.05$ : the larger HL, the lower involvement in HIB) and category of information seeking ( $r=0.753$ ,  $p<0.05$ : the higher level of information seeking, the higher HL). The results in Table 4 indicate that when these variables change, HL also changes. Literally the results signify that a higher HL reflects negative attitudes towards HIB, while the higher engagement in health related discussion was found to correlate to higher health literacy whereas higher HL was found to influence lower HIB and active information seekers were found to have higher HL. These findings are in line with other studies which have reported correlation between HL and attitudes towards HIB (Adams, 2010), HL and levels of engagement in health related discussion (US Department of Health and Human Services-HRSA, 2015), HL and health behaviours (Sun *et al.*, 2013; Davis, 2002; Schwartzberg and Wang, 2005; Nutbeam, 2008; Miller, *et al.*, 2007), HL and information seeking (Gutierrez *et al.*, 2014; Jeong and Kim, 2016).

### 4.0 CONCLUSIONS

Inadequate Health Literacy in the context of One Health Approach has been found to exist among people in the study area. Socio demographic variables have also been noted to have relatively less influence on HL, with significant correlation revealed on attitudes, levels of engagement in health related discussion, health behaviours and information seeking. However, this study had several limitations. First, there may have been selection bias, as study participants were not recruited proportionally on each socio demographic sub categories, i.e. equal number of respondents for each category based on sex, education levels etc. This approach may have brought on board a wider room for comparison within variables. Studies which take this into consideration will be needed in the future. Second, HL and HB were measured based on self-reported questionnaires. It is possible that these participants may report own HL and HB in a better way. This may have resulted in over-estimation of HL. A longitudinal study will be needed to address this issue.

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