The Impact of a Substance Use Prevention Program on the Health Literacy of Youth in Guatemala City

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Abstract

Low health literacy is a major public health concern with serious human and economic implications. Unfortunately, in developing countries little is known about health literacy, and there are often no educational programs to promote it. This report explores the influence of an already existing substance use intervention on the health literacy of youth living in Guatemala City. T-test results indicated that students who went through the substance use prevention program had significantly higher scores on the health literacy assessment than their peers. Likewise, participation in the program significantly predicted differences in health literacy, even when accounting for academic performance and parent education. These findings are of particular importance to resource-poor countries. If health education and prevention programs that are already being utilized are found to have a positive impact on health literacy, policy makers could potentially address two significant public health issues with a single evidence-based program.

Keywords: community health, global adolescent health, health education, health literacy

1. Background

Low health literacy (HL) is a major public health concern with serious human and economic implications. HL is complex, and encompasses reading, writing, basic math, speaking, and listening skills so that an individual can manage their health needs and set reasonable health goals (Nielsen-Bohlman, Pannzer, & Kindig, 2004). Among adults, the negative consequences of low HL include poor health, limited use of preventative care, and higher hospitalization rates (Heinrich, 2012). These adverse outcomes have an enormous economic impact in the US, with the latest estimates being approximated at $106 to $238 billion annually (Vernon, Trujillo, Rosenbaum, & DeBuono, 2007).

The public health concerns surrounding low HL have led to various new lines of research, one of which is promoting HL among youth. Manganello (2008) effectively outlined the need for researchers, educators, and policy makers to help youth develop HL skills and enhance their understanding of health care systems. Her calls for action contributed to the creation of government grant funding opportunities and new research centered on at-risk youth populations in the US (Trout, Hoffman, Epstein, & Nelson, 2014). While the US and other medically advanced countries have recognized adolescent HL as an important area of study, in emerging economies research and information about HL is often nonexistent.

Although HL data is not available in many parts of the world, in light of the public health challenges present in developing countries it may well be assumed that the negative human and per capita economic impact of low HL is even more severe than it is in the US. Resource poor countries face a variety of health-related challenges that have been linked to low HL. Some of these include limited access to health professionals, poorly equipped education and health care systems, and reduced availability of the internet (Hoffman, Marsiglia, Lambert, & Porta, 2015). One country that is faced with many of these challenges is Guatemala. According to the Henry J. Kaiser Family Foundation, in Guatemala there are just 9.3 physicians per 100,000 people, which is approximately 55% less than regional levels of health provider availability, and 225% lower than neighboring Mexico (Kaiser Family Foundation, 2015; US Central Intelligence Agency, 2015). Access to health information is further limited by low internet availability and usage. According to Internet World Stats (2012), just 16.2% of the Guatemalan population (2,280,000 of 14,099,032) has internet access. Limited access to healthcare services and information places the burden of managing chronic and preventable diseases on individuals and families. Unfortunately, macro-level health system deficits are directly linked to low HL and negative health outcomes as outlined in Manganello's (2008) theoretical framework, thus inhibiting the ability of individuals and families to effectively manage their health needs.

As a relatively new area of research in the US and throughout the world, there are various challenges to improving HL among youth, including a lack of consensus on whether (and/or how) it differs from HL among adults. Furthermore, there is a shortage of rigorous, time-tested education or intervention programs. Even more fundamental research problems are present in countries where little or no information on HL is available, such as in Guatemala. For example, validated instruments are needed, basic science reporting descriptive data is lacking, and no interventions or educational programs are currently being developed or tested (as far as can be

known). While culturally-tailored interventions specifically targeting HL are not likely to appear in Guatemala for some time given the country's need to attend to more pressing challenges, there are educational intervention programs currently being implemented that do focus on some aspects of health. One such program that is being used and has been implemented throughout the world is the Keepin' it REAL (KiR) substance use prevention program (Marsiglia et al., 2014). KiR is recognized as a model program on the National Registry of Effective Programs and Practices in the US, and has been culturally-tailored and adapted for use in countries throughout the world, including Spanish speaking countries such as Mexico (Marsiglia et al., 2014). The KiR program emphasizes four resistance strategies – refuse, explain, avoid, and leave (REAL). Using videos and a 10-week in-class curriculum, youth are taught to use drug resistance strategies in real-world scenarios. Although not one of its stated purposes, it is possible that the KiR program could influence adolescent HL. In fact, given the complex nature of HL and the various factors that contribute to a person's ability to manage their own health, it is possible that any type of health education could have a positive impact on HL. Not only is this assumption supported by Manganello's (2008) theoretical framework, but the idea of health interventions having unintentional alternative benefits in addition to their stated purposes is not uncommon (see Baum, Rotter, Reidler, & Brom, 2009; Geelhoed et al., 2013; Matuszek, 2010), and in this instance could prove to be extremely beneficial as the incorporation of HL-specific interventions in Guatemala may still be years away.

If health education and prevention programs that are currently being utilized are found to improve individual HL, policy makers could potentially address two significant public health issues with a single evidence-based program. In order to explore whether the KiR substance use prevention program that was already being utilized in Guatemala also impacted individual HL, the Spanish version of the Newest Vital Sign (NVS) HL assessment was administered to Guatemalan youth immediately after they had gone through the KiR program. It was hypothesized that the KiR treatment group (i.e., students who went through the substance use prevention program) would have higher scores on the NVS than students in the control group.

2. Method

In 2012, students ($N = 230$; Age $M = 12.09$) were recruited from 10 Guatemalan schools (similar to junior high schools in the US) to participate in the KiR program. Schools were randomized into control or treatment sites, with those at the treatment sites receiving the intervention from native (Guatemalan) instructors during the summer 2012 semester. Also during the summer semester students in both the treatment and control group were recruited to participate in the HL component of the KiR study. Those agreeing to participate were assessed using the Spanish version of the NVS immediately following the completion of the KiR program. Approval for this study was given by the Arizona State University Institutional Review Board (identification number 1202007459).

The NVS is an established and widely used brief assessment of HL that has been found to be psychometrically adequate for use among Guatemalan youth (see Hoffman, Marsiglia, Lambert, & Porta, 2015). Unlike other assessments that center on just one aspect of HL (for a

review of HL measures see Jordan, Osborne, & Buchbinder, 2011), the NVS provides a well-rounded perspective of HL skills by assessing reading, interpretation, and numeracy. This is done by asking participants to answer six questions based on information found on the back of a nutrition label (e.g., If you eat the entire container, how many calories will you eat?). Participants are not allowed to use pencil and paper to calculate responses, but must do the simple calculations in their mind. Typically, the assessment takes less than five minutes to complete. Scores of 0-1 indicate a high likelihood of limited HL; 2-3 indicate the possibility of limited HL; and 4-6 indicate adequate literacy (Weiss et al., 2005).

In addition to HL, other variables of focus included gender (0 = female, 1 = male) age, socioeconomic status (calculated by averaging six questions on whether there was enough money in the participant's home for things such as food, school needs, clothing, etc.; 0 = almost never have enough money, 3 = almost always have enough money), grades (0 = mostly D's or lower, to 3 = mostly A's), and educational attainment of the most highly educated parent (0 = did not finish elementary, to 4 = college degree). Each of these variables has been shown to be correlated with HL, and has been used in previous studies with Spanish speaking youth populations (Marsiglia et al., 2014; Trout, Hoffman, Epstein, & Nelson, 2014). T-tests were used to compare participants in the treatment and control groups, and Cohen's d effect sizes were computed for each item. Criteria for interpreting the magnitude of the effect sizes were based on Cohen's (1998) recommendations (d < 0.2 = weak; d = 0.2 - 0.79 = moderate; d > 0.8 = strong).

3. Results

Table 1 shows t-test differences between participants in the KiR control and treatment groups. Students in the treatment group had significantly higher HL scores on the NVS than those in the control group. The magnitude of the difference was strong, with an effect size of 1.10. The only other variable demonstrating significant differences between the two groups was parent education, with those in the treatment group having more highly educated parents on average. The effect size of this difference was moderate at 0.48. When all variables were entered into a linear regression (not shown in table) with NVS scores being predicted by condition group, the findings were again significant (B=1.16, p< .001; Model R^2=0.23). No other variable in the linear regression was a significant predictor of HL, including parent education.

Table 1. T-test differences by group

	Condition	Treatment		
	N = 83	N = 101	t	Cohen's d
NVS Score	2.12	3.32	-7.57***	1.10
Gender	0.55	0.54	0.26	0.04
Age	12.50	12.60	-0.53	0.08
SES	2.24	2.29	-0.64	0.09
Grades	2.05	1.87	1.28	0.19
Parent Education	1.49	2.10	-3.27**	0.48

*p<.05; **p<.01; ***p<.001

4. Discussion

In order to explore whether the KiR substance use prevention program that was already being utilized in Guatemala also impacted HL among youth, we tested the hypothesis that those in the KiR treatment group would have higher scores on the NVS than students in the control group. While the KiR program did not specifically teach HL skills such as literacy, numeracy, and comprehension, on average those in the intervention group scored a whole point (17%) higher on the NVS. This finding supported our hypothesis, and is in line with the theoretical suggestion that any type of health education program could positively impact HL (Manganello, 2008). A follow-up linear regression model assessing the impact of group assignment on HL further supported our hypothesis, finding participation in the KiR program to be a significant predictor of higher HL even when controlling for parent education and other related variables.

With inadequate healthcare availability, limited internet access, and a historically problematic education system that continues to struggle despite international support (Palacios, 2014), the human and economic need for HL education in Guatemala is clear. The findings of this study provide an initial step towards understanding how HL might be promoted using resources that are already available. The unanticipated alternative HL benefits of the KiR program suggest that other health programs available in Guatemala may also have unforeseen positive value. With international public health interventions often costing hundreds of thousands of dollars (National Institutes of Health, 2015), these finding suggest the possibility of a unique cost-effective approach to improving HL. If health education and prevention programs such as KiR that are already being administered also have a positive impact on HL, policy makers could potentially address two public health issues with a single evidence-based program. This could free up additional money for improving other public health entities that directly impact HL, such as government healthcare and education systems.

Two study limitations should be noted. First, the HL assessment was administered at the end of the KiR intervention, thus preventing bold claims to be made regarding the differing HL levels between groups or the amount of improvement made within groups. However, as an initial exploratory study conducted in a country with limited research on adolescent health, the findings are encouraging and useful for laying a foundation for future studies. Second, participants were currently attending the US equivalent of junior high school, meaning they are a unique subgroup when compared with other youth their age. These findings cannot be generalized to youth who are unable or choose not to attend schools in Guatemala City for various family, economic, or geographic reasons.

5. Conclusion

Despite these limitations, the results of this study are promising for researchers and community stakeholders in developing countries who are interested in promoting adolescent HL. While HL-specific programs are yet to be developed in many areas of the world, gains may potentially still be made by having youth attend some form of health education or prevention course already being provided. Further research assessing the HL impact of such programs in Guatemala and other countries is needed to ascertain whether the results of this

exploratory study can be replicated.

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