PUBLIC HEALTH IN PUBLIC LIBRARIES: AN OBSERVATIONAL ANALYSIS OF SEALS' THEORY OF EDUCATIONAL ENERGY DEVELOPMENT

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ABSTRACT

Free offerings at public libraries are an important community resource for health education yet only two previous studies were identified. Seals' Theory of Educational Energy Development (STEED) was used as a model for assessing variables related to educational energy in health and health-related classes. Five sites and thirteen classes were selected for observation from one county in central New Jersey. Class topics ranged from information such as navigating Medicare to activity such as exercise for senior citizens. Target populations for these health programs ranged from toddlers to the elderly. An observation protocol and coding scheme was used to evaluate the curriculum, interaction, match between teaching and students' imaginative stage and educational energy. Results show that observed health and health-related classes offered at local public libraries were predominantly educative. Interaction and internal and external curriculum coherence were most frequently coded as high. Health education in such community-based settings can be an effective strategy to promote healthy lifestyles and disseminate important information. The theory was validated and had high face validity. Future research of health education should include larger samples, a means to assess the longer-term effects of educational energy, and more sensitive measures.

INTRODUCTION

Background

Health education is more relevant today than ever in addressing public health problems. The World Health Organization (WHO) describes health education as any combination of learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes (World Health Organization, 2017). Health education is an integral part of public health as education is a key factor in a community's well-being (Sharma, 2017). Health education can be a setting-based approach to promote health in specific areas such as schools, hospitals, workplaces, residential areas and communities. Through educational programs, health issues can be effectively addressed by empowering individuals and communities to take action for their health (Kumar & Preetha, 2012). By enabling people to take control over their health and its determinants, improvements in community health can be seen.

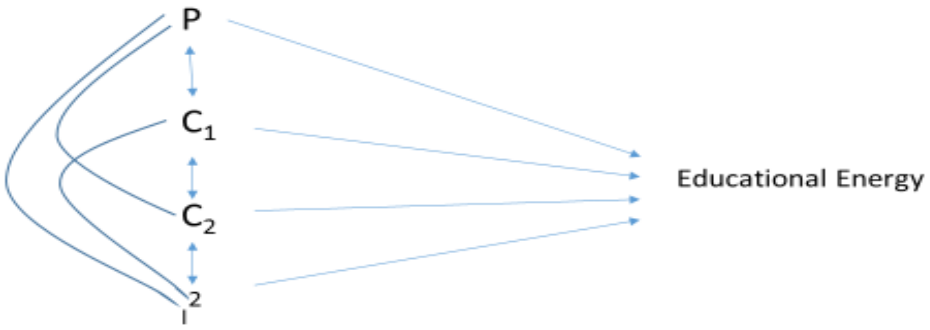
Health and quality of life rely on many community systems and factors, not just a health care system. Making changes within community systems, such as schools and libraries, can improve the health of the community. Health education is the most frequently used strategy to promote health in a community and in public health education. Utilizing education in community settings can reduce factors that contribute to health problems. Changes based on instituting new programs or policies can lead to changes in the

community's attitudes, beliefs or social norms on practicing a healthy lifestyle (HealthyPeople.gov). By using leading educational techniques health educators in community settings like libraries can promote healthy habits, provide information and facilitate access to care (Morgan, et al, 2018; Whiteman et al, 2018).

However, health education in naturalistic settings like public libraries is understudied. On November 28, 2017 PubMed was searched using keywords "Health Education", "Community" and "Library" and found 2 studies out of 156 relating to our research topic, both published in the last year. One was a study of 262 library directors in Pennsylvania helping patrons with nutrition, exercise and social welfare benefits. Most respondents reported they were inadequately prepared to assist patrons with health and social issues. Forty percent said their library offered some health programming but did not meet the level of need (Whiteman, et al, 2018). The second study offered training on homelessness, mental health, substance use disorders, and trauma to 33 library staff. From the pre-/post-assessments, staff reported significant increases in comfort, confidence and preparedness to help patrons (Morgan, et al, 2018). However no studies were conducted for health education classes. Our study sought to fill this gap.

Theoretical Orientation

Although many theories exist in public health that apply to behavior change (e.g. The Theory of Planned Behavior, Ajzen, 1991), no theory was identified that dealt with education itself in the public health or communication studies literature. However, in the Educational Science literature, the Seals Theory of Educational Energy Development (Seals, 2019), was identified. This theory allowed for assessing educational energy among those attending classes and assessing predictive variables. Each variable is described in the measurement section but the heuristic model appears below to illustrate the model



(Seals, 2019).

Figure 1. Heuristic Model of Seals Theory of Educational Energy Development

Benefits of Naturalistic Observational to Public Health

Naturalistic observational studies are valuable to Public Health research because of the "real-world" application of these studies (Guest, 2014). Observational controlled studies document the consequences of a variable of interest without intervention. Depending on the study design and variable of interest, observational studies can arguably be more accurate than randomized control standards, which are held as the "gold-standard" in public health. This is because randomized control studies occur under ideal conditions, while observational studies are subject to "real-world" conditions. This caveat can also introduce confounding variables in observational studies, however, there are many cases in which observational studies are more appropriate (For examples: Nilson et al 2015; Slatcher et al, 2011; Sussman, et al, 2016). However, naturalistic observation studies are rare in health education and usually conducted for training content only (Tully, et al, 2016; Sogoric et al, 2005).

Our study sought to observe and assess health education in practice in a naturalistic, community setting. Because of the newness of both the theory and methods of naturalistic observation, this exploratory study

is a first step towards refining methods and seeks to describe the generated quantitative data. We explore some bi-variate results for the dependent and one independent variable.

METHODS

Coding Sites and Participants

Participating sites were selected from New Jersey public libraries. We selected one county and from within that county library system, four branches with 2-3 observations at each branch for a total of 11 observations during October and November of 2017. We added 2 observations from one small college. All classes were freely available to the public. At least two coders attended each coding session using a standardized protocol. Attendees of the sessions were considered participants; coders were not counted as participants for measures of this study.

Coding Scheme

The coding scheme is based on the Seals Theory of Educational Energy Development (Seals, 2019).
E = Educational Energy = the level of intensity among students directed at the curriculum. Educational energy may be coded in three ways: 1) high (students intent to learn the planned lesson), 2) medium (students are as concerned as not to learn lessons), or 3) as low (students are unconcerned to learn the planned lesson).
i = Interaction = how widespread and how strong is student engagement in/disengagement from the lesson. When it comes to being in the classroom are students more like 'a penny in a pocket' or more like 'a fish in a stream'? (Dewey, 1988).
P = Stocks of Knowledge = There are two types of stocks of knowledge, generative and propositional (Egan, 1998). Generative = how well does the narrative structure of the lesson match student stage of imaginative development (somatic/bodily = ages 1-3, mythic/abstract binary concepts, like fairy tales = 4-7, romantic/extremes of experience = 8-15, philosophic/general theories = 16-22, ironic/limits to theories = 23+). Propositional = how easy is it for students to understand the language used in the lesson.
c_1 = Internal Curriculum Coherence = how well do the pieces of the curriculum fit together
c_2 = External Curriculum Coherence = how well does the curriculum help students navigate extra-school life (Beane, 1995).
The coding sheet used to measure in this study was divided up into the variables listed in the coding scheme with fifteen-minute time intervals based on the typically hour-long longevity of the programs. Educational energy signified the excitement of the audience members who attended the health education programs. Interaction was defined as the engagement in or the disengagement from the physical and social environment the participants shared with the instructor. P in this coding scheme represents stocks of knowledge, which are subcategorized into generative and propositional. Generative describes how well the instructor presents the information to the audience in a way that will match their imaginative development. Stages of imaginative development were divided into somatic, mythic, romantic philosophic, and ironic. Somatic refers to understanding concepts in terms of one's own body. Mythic is defined as abstract binary concepts and romantic refers to extremes of experiences. Philosophic represents an imaginative interest in how things, in theory, work. Finally, ironic refers to participants coming to the realization that all concepts in this world have a limited scope. Propositional knowledge is coded in terms of how easily the students were able to understand the language the instructor was using during their presentation. C_1 is the internal curriculum coherence, how well the instructor was able to cohesively fit all the material in a way that it flows well for the students. Moreover, c_2 is defined as external curriculum coherence which concerns how the participants will use the knowledge they learned in their personal lives.

PROCEDURE

Students signed up to code at least 3 health education sessions. Each session was attended by a group of 2-3 students. As a group they were required to code at least 5 sessions over the semester. Observed class topics ranged from information such as navigating Medicare to activity such as exercise for senior citizens. Target populations for these health programs ranged from toddlers to the elderly. An observation protocol and coding scheme was used to evaluate the internal coherence and the external coherence of the curriculum, levels of interaction, match between teaching and students' imaginative stage of development and educational energy. At the health education presentations, students used a coding sheet to analyze the teaching style and to evaluate audience reception. Once finished, those notes on the coding sheet were translated into numerical equivalents in order to analyze the data using qualitative measures. That data was entered into a database in order to find correlations and make conclusions.

MEASUREMENTS

The researchers assigned values for each of the components of the coding scheme in order to translate the results numerically as follows:

Educational Energy (represented by E) was assigned on a scale ranging from -1 to 1. The lowest value was -1 (situations where students are unconcerned to learn the planned lesson). The next value was 0 (students are as concerned as not to learn lessons). The highest value possible was 1 (situations where students were excited to learn the intended lesson).

Interaction (represented by I) was assigned on a scale ranging from 1-3. The lowest value was 1, where the interaction and engagement levels of the participants were low. The following value was 2, where interaction and engagement levels were moderate. The highest value possible was 3, where interaction and engagement levels were high.

Stocks of knowledge (represented by P) was divided into two separate sections, generative and propositional. Generative stocks of knowledge (P1) were assigned on a scale ranging from 1-5. The lowest value was 1, which represented the somatic stage of imaginative development. The following value was 2, which represented the mythic stage. The following value was 3, which represented the romantic stage. The following value was 4, the philosophic stage. The highest value possible was 5, which represented the ironic stage. Propositional stocks of knowledge (P2) were assigned on a scale ranging from 1-3. The lowest value was 1, which represented a low ease of understanding of language used. The following value was 2, which represented a moderate ease of understanding of language used. The highest value possible was 3, which represented a high ease of understanding of language used.

Curriculum Coherence (represented by C) was divided into two separate sections: internal and external. Internal Curriculum Coherence (C1) was measured on a scale ranging from 1-3. The lowest value was 1, which represented a low fit amongst the pieces of the curriculum. The following value was 2, which represented a moderate fit amongst the pieces of curriculum. The highest value was 3, which represented a high fit amongst the pieces of the curriculum. External Curriculum Coherence (C2) was measured on a scale ranging from 1-3. The lowest value was 1, which represented a low possibility for students to use information from curriculum outside of the classroom. The following value was 2, which represented a moderate possibility for students to use information from curriculum outside of the classroom. The highest value was 3, which represented a high possibility for students to use information from curriculum outside of the classroom.

Analysis Plan

The data was analyzed by using SPSS. Data was entered into a database and was cross checked for completeness. As an exploratory study, each coding was treated independently for a total of 122 observations. Crosstabs were generated between educational energy (E) and the independent variables

(P-Propositional and Generative, C_1, C_2, and I^2). Chi-square analyses were conducted, however, because of skewness in the data due to concentration of cases in one category, no significance levels are reported.

RESULTS

The goal of this study is to report on the observed health education courses offered at a public library and the study is exploratory because it is a test of a new theory focused on education as experienced by participants. Hence, the results are primarily descriptive and meant to be a starting point for testing the theory and refining measures. The univariate frequencies and percentages are provided in table 1. For educational energy, most observations were coded as High. For P (Generative), somatic was observed in the highest frequency, followed by philosophic, ironic, romantic then mythic. P (Propositional), C_1, C_2, and I^2 mostly coded as high. Because of the concentration of cases in one category, analysis was limited to bi-variate results.

Table 1. Frequencies (column percentages) of the dependent and independent variables

Variables	Categories	Frequency (%)
Educational Energy	Low	2 (1.6)
	Medium	8 (6.6)
	High	112 (91.8)
P (Generative)	Somatic	42 (34.4)
	Mythic	8 (6.6)
	Romantic	10 (8.2)
	Philosophic	31 (25.4)
	Ironic	31 (25.4)
P (Propositional)	Low	11 (9.0)
	Medium	19 (15.6)
	High	92 (75.4)
I^2	Low	8 (6.6)
	Medium	19 (15.6)
	High	95 (77.9)
C_1	Low	9 (7.4)
	Medium	10 (8.2)

	High	103 (84.4)
C_2	Low	13 (10.7)
	Medium	12 (9.8)
	High	97 (79.5)

Table 2 and 3 present the bi-variate relationships between Educational Energy and the independent variables and between stage of imagination and the other independent variables. The vast majority of cases were categorized as educative for the dependent variable and high for the independent variables.

Table 2. Independent Variable and the relationship to Educational Energy (row percentages).

		Miseducative	Noneducative	Educative
I^2	**High**	0	4(4)	91(96)
	Medium	0	1(5)	18(95)
	Low	2(25)	3(37.5)	3(37.5)
C_1	**High**	0	0	103(100)
	Medium	0	2(20)	8(80)
	Low	2(22)	6(67)	1(11)
C_2	**High**	0	2(2)	95(98)
	Medium	0	0	12(100)
	Low	2(15)	6(46)	5(39)
P (Propositional)	**High**	0	1(1)	91(99)
	Medium	0	1(5)	18(95)
	Low	2(18)	6(55)	3(27)

Table 3. Relationship between level of Imaginative Development and other independent variables (row percentages).

		Somatic & Mythic	Romantic, Philosophic, & Ironic
I^2	**High**	37(42)	51 (58)
	Medium	6(35)	11(65)
	Low	5(63)	3(37)
C_1	**High**	38(40)	57(60)
	Medium	2(22)	7(78)
	Low	8(89)	1(11)
C_2	**High**	32(36)	57(64)
	Medium	4(36)	7(64)
	Low	12(92)	1(8)
P (Propositional)	**High**	35(41)	51(59)
	Medium	3(19)	13(81)
	Low	10(91)	1(9)

DISCUSSION

Many people come to library classes in an effort to better their health or to educate themselves on a health issue (Whiteman, 2018). Libraries are a place in which individuals can come together in order to create community bonds that can influence in a positive way the impact of the interventions that are given (CDC 2011). Student observers said that the strength of their experience was positively influenced because of the face validity of theory. Specifically, face validity is high when: 1) the assessments fully covers the concept that it is purported to measure; 2) different concepts are distinguishable from each other in the theory; and 3) the response coding categories can be distinguished. Students affirmed that each concept in the theory was independent and that they could distinguish between category responses ranging from high to low. Beyond this, the students described that the theory became more of a paradigm through which they viewed all of the classes that they were taking. They reported that they could not "turn the theory off" especially in their classes where there were times when the professor's presentation of class material "tanked" or "soared."

The results of this exploratory study primarily contribute to the methods for observing classrooms in "real time." That most community-based health and health-related classes were coded as having high educational energy could be a real finding. Both the presenters and library patrons came together voluntarily due to an interest in the subject. Students discussed their codings at the beginning of each class over the period of data collection and were concerned until cases were observed where educational energy was low or moderate. For example, in one class, "yoga for tots", the instructor "lost" the attention of the tots when she "went over their heads" and lectured about the philosophy and value of yoga, something that the somatic learners were not ready to hear. In another example, a course on Medicare lacked educational energy during their first two 15-minute periods of "dry" lecture but the class became animated when participants wrested the course content away from the instructor and discussed problems and questions that they had with Medicare. The research students concluded that, in courses with high educational energy, there was a good match across all variables in the theory. The students bemoaned the fact that the sample did not have more medium and low energy cases as they thought that they could have better seen the demonstration of the theory at work.

The limits of this study are that it was a small sample testing a new theory with new methods which provided challenges as well as "eye opening" opportunities. Students reported improving on their coding skills over time but said that they would have benefitted from 6 or more observations. Their initial training in observation methods relied on short clips from video tapes of classroom behavior from the HBO series "The Wire" and classes available on YouTube that showed both the teacher and students. Students thought that real-time coding was more difficult and asked if more videotapes could be made of health education sessions for practice prior to going into the field. Students applauded the opportunity to study a "real-life" setting and noted how much they thought that they learned and could apply to their own lives.

The students noted that they may have introduced "observer bias" into the study. Specifically because the classes were small, it was impossible to simply blend or go unnoticed as classroom observers. Students thought that the effect of their presence diminished over the course of the class and was possibly minimal in activity courses such as yoga or exercise for the elderly. However, the high levels of educational energy may have been an effort by class participants to impress these obvious visitors to the class.

The newness of this theory and the observational methods to test it provide a unique opportunity for students to be on the ground floor contributing to both. Students' final recommendation is that further studies be conducted with new venues that may provide a wider range of educational energy such as the classes that they were taking at TCNJ where there may be a less strong match between the instructor and the desire of the students to learn the material. As future health educators, students described themselves as happy that they now had what they described as a paradigm with which to view the classroom. They said they were convinced that when giving presentations as in their other classes, that they could tell when they were "tanking" or "soaring" and that they felt like the variables in the model gave them tools to make their presentations soar. Harnessing educational energy shows promise for improving

educational energy and linking public health programs to meaningful change in the health behaviors, lifestyles and health outcomes of populations.

CONCLUSION

This exploratory study as a first step towards assessing educational energy is important for health education. Health education classes need to be evaluated beyond the traditional survey of class attendees using a pre-/post- knowledge and behavior survey (Sharma, 2017). Assessments of health education demonstrate s short term increases in knowledge but the relationship to behavior change is weak (Sharma, 2017; Kumar & Preetha, 2012). If the health of populations and communities is to improve, then health education, arguably the "bread and butter" of health interventions, needs to be linked to changes in behavior. Specifically, to improve the quality and effectiveness of health education instruction we need to understand much better than we do at present the dynamics among the instructor, the curriculum and the attendees at health education sessions. What is needed is a theory that includes variables, such as those found in Seals' theory that can be manipulated by instructors to improve the educational energy created by instruction.

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