AN ANALYSIS OF THE SOCIAL NETWORKS IN HEALTH PROMOTING SCHOOLS*

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Abstract: This multi-case study aims to compare the social networks of health promoting schools with different qualities of health service management. Selected using a purposive sampling technique, the samples were three secondary schools in Nonthaburi Province under the Office of the Basic Education Commission. The criteria for the selection were school size and the quality of health service management. From the three sample schools, 181 informants participated in the study. Data analysis included descriptive statistics, social network analyses using UCINET and Net Draw programs. The results were as follows. The social networks in health promoting schools with better health service management were larger and less centralized. Analyses of the whole-networks revealed that schools with different qualities of health service management had different social network characteristics. By the comparison of social networks of schools, it was found that network size and centralization can be used to categorize schools with diverse good health service management. The density of the network and eigenvector centrality cannot be clearly categorized.

Introduction

The 6th Global Conference on Health Promotion in August 2005 entitled "Policy and Partnership for Action: Addressing the Determinants of Health", announced the strategies for health promotion in a globalized world and the activities necessary for advancing the operations of all the parties and areas involved. According to the Bangkok Charter for Health Promotion in a Globalized World, WHO (2005), this included advocating, investment, building capacity, regulation and legislation, and building partnership and alliances. Advocating refers to giving recommendations on health on the basis of human rights and brotherhood. Investment is aimed at sustainable development and operations as well as the provision of basic infrastructure for managing the factors determining health conditions. Building capacity is done by formulating policies for creating leadership, bettering health promotion skills, disseminating knowledge and research, and ultimately developing expertise in health-related areas. Regulation and legislation protect people from danger and promote an equal opportunity for having good health. Building partnership and alliances is done to obtain collaboration from the public sector, the private sector, people, societies, and international organizations in order that all are involved in sustainable health promotion activities.

The success of the above endeavors depends on several key factors, one of which is the social network. This was emphasized in an article by WHO Region Office for the Western Pacific published in the New Horizon in Health Journal, stating that only with the active involvement of communities other than public health agencies will health promotion and protection measures be effective. In a similar vein, health promoting schools will succeed only if they obtain cooperation from health and educational agencies, parents, communities, and local agencies (HSRI, 1998).

Conceptual Framework

Social interaction is an indicator of success in health promoting schools (Tones, 2005). According to the research concerning the mechanism of health promoting tasks, of all the factors that help build partnerships and alliances, such as collaboration among schools, community, civil society, and combining schools with community resources, the structure of social networks at the school level is the most important one as the results can be recognized at both student level and school level. Also it reflects the success of the sustainable health supporting service (Cheshlarov et al., 2002; Simovska, 2004; Konu et al., 2007, Sherwood-Puzzello et al., 2007). Furthermore, outside facilitators and outside coordinators (Kramomthong et al. 2003; Pearlman et al., 2005; Austin et al., 2006) are indispensably important throughout the school's health promoting process.

Social Network Analysis (SNA) is a methodology for understanding the capacity of an organization to engage in its activities based on its organization structure, operationally defined or not, both informally and formally. It helps to get at the structure of an organization beyond the linear additive elements of program components (Durland & Fredericks, 2005). It has been widely used. According to Borgatti and Molina (2003), SNA is a tool for several types of studies such as tracking and discovering the spread of major contagious diseases, tracking important criminals, and improving and developing organizations. Currently, more than sixteen SNAs have been developed with different strengths and limitations such as UCINET, SIENA, Pajek, StOCNET, STRUCTURE, MultiNet and NetMiner.

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There are two approaches which can be used to analyze social networks. First, the egocentric network approach. This approach aims to discover the key people in a network. This information is obtained by asking the people in the network to identify the significance of other people in the network they are related to in any way such as connectedness, information support, emotional support, and tangible support. Then, this information is analyzed and diagrammed, revealing the relationship of the people in the network as well as their status and significance. This approach is suitable for analyzing small networks or randomly selecting some member networks for an analysis. In terms of benefits, it saves time and costs (Freeman, 1979). Research following this approach includes that of Bernard et al. (1990), Burt (1984, 1985), Marsden (1987), and Wellman (1993). Second, the sociocentric network or whole-network approach. This approach specifies the exact boundary of a network and then investigates all the relationships in it. Studies such as Wellman and Berkowitz (1988), Morris (2004), and Wasserman and Galaskiewicz (1994) followed this approach.

In Thailand, Previous mechanisms in support of health services management in schools have been set forth in practice guidelines, but lack substantial motivation, development and promotion while there is only a handful studies regarding networks in health practice. Since there have been very few studies of social networking, specifically in much structure-changing management circumstances in secondary school,

We want to know how its difference among the school networks, we used the whole-network conceptualization to study by way of comparing social networking in different school health service capability will be adapted to acquire related information to continually develop Heath Promoting Schools.

Objective

The researchers set the objective: to compare the characteristics of the social networks in health promoting schools with different qualities of health service management in Nonthaburi province.

Methods

The methodology employed in this research was that of a multi-case study approach.

Selecting Sample Schools

The purposive sampling technique was used for selecting the schools under the Office of the Basic Education Commission (OBEC). The selection criteria were as follows. (1) Location. All the schools had to be in the same province, under the same educational services area. (2) Size. All the schools had to be of the same school size. (3) All the schools in terms of health service management had to be different.

From the criteria, the researchers selected the sample schools following the steps.

(1) Schools under the Office of Nonthaburi Educational Service Area 1 were selected because schools in this area had similar demographic characteristics to the majority of secondary schools in other areas also under the OBEC. (2) There were eleven schools under the Office of Nonthaburi Educational Service Area 1. Among these, we survey the School Size, Health Service, and Student Well-being data from school health teachers; the level of health service management was rated as high for four schools and as medium for seven. As no schools had health service management which required improvement or low, two schools in the high group were selected, namely Schools 1 and 2, and one in the medium group was chosen, namely School 5. The three schools were compared and contrasted in terms of their social networks. These results are presented in Table 1 below.

Table 1: School Characteristics in Nonthaburi

School	School Size [1]	Health Service Score (%)	Level of Health Service [2]	Student Well-being Score (%)	Level of Student Well-being [3]
1 (A)	Very large	88.97	High	93.33	High
2 (B)	Very large	88.89	High	96.06	High
3	Very large	86.11	High	84.90	Medium
4	Very large	85.07	High	95.62	High
5 (C)	Very large	73.96	Medium	89.21	Medium
6	Very large	69.10	Medium	86.60	Medium
7	Large	65.97	Medium	88.75	Medium
8	Large	65.97	Medium	89.99	Medium
9	Medium	63.54	Medium	91.56	High
10	Very large	54.86	Medium	94.74	High
11	Very large	51.04	Medium	78.01	Medium

[1] Student: 1-299 = Small, 300-999 = Medium, 1,000-1,900 = Large, 2,000^{+} = Very large
[2] Score: 0-40 = Low, 41-80 = Medium, 81-100 = High
[3] Score: 0-49 = Low, 50-74 = Medium, 75-89, 90-100 = High

Boundary of the Social Networks

A network defines the boundaries within which a relationship will be measured. According to Wassermann and Faust (2005), "A social network consists of a finite set of actors and the relation or relations defined on them." The present study, the boundaries of the social networks in the sample schools was determined, consisting of health-related personnel such as school administrators, teachers, and students or others involved in health activities.

Data Collection

The data collection included (1) interviews about networks of operations, (2) interviews about the social networks in the schools, (3) observations, and (4) focused group interviews with the leading groups in the three schools for triangulation purposes (Anklam, 2004). Data collection began in February 2009, and ended in March 2009.

The semi-structured interview, and focused group interviews guide were developed by seven experts and try out in 33 participants (administrators, teachers, and students).

To approach the participants, the name generator technique was followed as: (1) Talks were initiated with the health teachers and school administrators, focusing on the policies, operations, task assignment, and names of the leaders in the schools' health promotion activities. (2) The data on the networks were collected from all the leaders of health promotion activities. (3) The collected data were then diagrammed, showing the health-related social networks in the schools. (4) The diagrammed network data were validated by the health teachers, the leading students and the people involved. Suggestions from these people were also used to revise the data.

Sample group

Individuals in the school social networks interviewed include 68 staff members from school A, 71 staff members from school B with a high level of health service and 42 staff members from schools C with medium level of health services. The sample group includes the school administrators, health teachers, other teachers involved in school health promoting activities, the student leaders, and others, as well as parents, alumnus and related staff. The respondents' network from three schools, an overall total of 181 people as shown in the table 2.

Table 2: Participants in the Social Network Analysis

Participants	Selected Schools		
	School A	School B	School C
1. School administrators	2	2	1
2. Teachers	7	8	5
3. Student leaders	57	58	36
4. Other people including parents, alumnus, and personnel in related agencies	2	3	-
Total (181)	68	71	42

Data analysis

Data analysis was performed with descriptive statistical methods and the whole- networks were analyzed with the UCINET 6.187 program and Net Draw 2.081. The four measurements of network attribute were network size, density, eigenvector centrality and centralization. UCINET is a comprehensive program for the analysis of social networks (Borgatti, Everett, and Freeman, 2002). The program computed them one by one, it allows file import form Excel. Then, we using NetDraw, a subprogram of UCINET, it provides visual representations of three school networks.

Results

The results of the social network characteristics analysis: **Network size**; The high level of school health services (school B) has the largest network size with 125 members, second largest is the high level (school A) with 107 members, and the smallest is the medium level (school C) with 89 members. The data indicates that the high level of health service schools (school A and B) has a larger network size is higher than medium level (school C).

Density is calculated the total number of connections or ties divided by the total number of possible connection. Social network in medium level of school health services (school C) have the highest density of 0.0575, high level of health service school's 0.0452 density (school A), high level of health service school's lowest density of 0.0268 (school B), consequently.

Eigenvector centrality; Social network in medium level of school health services (school C) have the highest Eigenvector of 0.063, high level of health service school's 0.054 Eigenvector (school A), high level of health service school's lowest Eigenvector of 0.045 (school B). Eigenvector centrality is a measure of the importance of a node in a network. It assigns relative scores to all nodes in the network based on the principle that connections to nodes having a high score contribute more to the score of the node in question.

Centralization; Social network in medium level of health service school (school C) has the largest network centralization index percentage of 81.40. Next are the 77.72% index from social network in the high level of health service school (school B) and lastly the high level of health service school (school A)'s 67.60%. Centralization is the ratio of the actual sum of differences to the maximum possible sum of differences (Freeman, 1979). A centralized network will have much of its links dispersed around one or a few nodes, while a decentralized network is one in which there is little variation between the n of links each node possesses. The data indicates that a centralized work

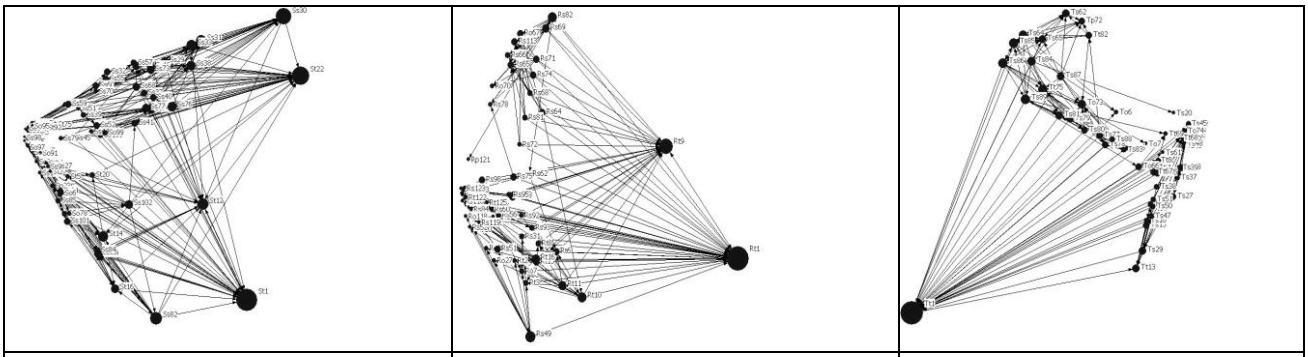
structure depends on the central person. The school C is much depending on one single person. It can be conclude that if she becomes busier or is removed. The workflow, apparently, will be interrupted.

The Results from the whole-network analysis indicated the following: The comparison of school health networks found that network size and centralization can be used to categorize schools with diverse qualities of health service management. The density of the network and eigenvector centrality cannot be clearly categorized.

The researchers had the opinion that the aforementioned research findings occurred because the centralization was a value acquired from the functional analysis of members in the network, which reflected the working characteristics and interaction between network members. As for the density of the network, this usually depends upon the network size as well, i.e. small networks have the tendency to have greater density than larger organizations. Furthermore, the working characteristics of school health networks generally coordinate within only subgroups rather than between groups. Therefore, smaller

Table 3: Characteristics of the school health networks from the whole-network analysis

Characteristics of the network	Selected Schools		
	School A	School B	School C
(1) Network Size	107	125	89
(2) Density			
- Avg. value	0.0452	0.0268	0.0575
- SD.	0.3131	0.2657	0.3778
(3) Eigenvector centrality			
- Avg. value	0.054	0.045	0.063
- SD.	0.081	0.077	0.085
(4) Centralization	67.60	77.72	81.40



School A = 67.60 % | School B = 77.72 % | School C = 81.40 %

Figure 1: Centralization of the School Health Networks

Discussion

With regard to the parameters of the features of social networks serving at the objects of this study, it was found that network size and centralization can be used to categorize schools with diverse qualities of health service management while the density of the network and eigenvector centrality cannot be clearly categorized. These research findings were in agreement with the research of Roberts, S. (2008) finding that larger networks had both more strong ties and more weak ties than smaller networks. In contrast for related alters, larger networks had disproportionately more weak ties than smaller networks and Kayla de la Haye et al. (2008) that studied and compared the three networks varied in density, the data show that smaller networks had higher density. However, the present study finding was not in agreement with Hite and et al. (2005) who found that network size and density could be used well in categorizing differences among networks while centralization could not be clearly categorized.

networks with centralized working may have higher density. Thus, the comparison of density values between networks with different sizes should be avoided with statistical significance. Furthermore, Mayhew and Levinger (1976) explained that the density value also depends upon the types of relations submitted to analysis e.g. loving relations will have lower density values in the network than awareness relations, etc.

The results of present study suggest possible strategies to promote school network. Such collaboration should concern both the student leaders and health teachers by employing different methods; seminars, stage of knowledge and experience exchange, nearby schools research. The findings on should encourage its different networks to interact with one another. That is to stimulate the internal network for corporation and interconnectedness within subgroup in order to succeed the continuous-learning purpose.

Future research

For the future it is important to develop feasible research designs which studies a dynamic relationship among members of network and studies a multi-level relationship of the members because this study can only catch a snapshot of the network, which does not represent a true picture of the network at another time. Thus future work is needed more times to collect the data and appropriate program analysis that meaningful about network size, density, eigenvector centrality and centralization of network in lager scales.

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