Development of Natural Helper Characteristic Scale (NHCS): An Instrument for Identifying Natural Helpers for Health Area in Thai Context

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Background: *Volunteerism in health through cadres of village health volunteers (VHV) has been common since the "health for all" campaign. At present, with political support, the VHV receives monthly financial support, and this creates a conflict of interest and competition among the VHV groups. Therefore, a tool to identify the VHV who has natural helper characteristics, a voluntary mind set and a readiness to help is needed.*
Objective: *The purpose of the present study was to develop and test the quality of the natural helper characteristic scale (NHCS).*
Material and Method: *The present study used a multi-methods design to identify natural helper characteristic constructs in the Thai public health context by interviewing community leaders and public health professionals who have experience in working with natural helpers successfully. Suggested constructs have been validated with key informants using telephone interview to confirm the common constructs before reconfirmation with factor analysis and reliability statistical test.*
Results: *Qualitative data indicated 3 constructs is commonly found and statistically tested by exploratory factor analysis revealed a 30-item with a five-factor solution (altruism, role recognition, openness to new experiences, family readiness, and social acceptance) that accounted for 62.24% of the variance. The finding of confirmatory factor analysis indicated that the 5-factor model with 24 items demonstrated acceptable fit indicated a good fit to the data ($\chi^2 = 439.91$; df = 217 ($p<0.001$); χ^2/ df = 2.02; RMSEA = 0.05; GFI = 0.90; and, CFI = 0.96). Cronbach's alpha coefficients of the total scale's Cronbach's alpha was 0.94.*
Conclusion: *The NHCS demonstrated evidence of the content and construct validity, and adequate internal consistency reliability. The NHCS can be used for identifying natural helpers in working for the health programs.*

Keywords: *Characteristics of natural helper, Development and testing, Health area*

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Natural helpers are defined as "lay people to whom people naturally turn for advice, emotional support, and tangible aid[1,2]". They are usually the first person of contact within the community when seeking assistance[2] and maintain a good reputation within the community as natural helpers. In this respect, natural helpers have been used in public health to gain support for and implement community health programs. The use of natural helpers is likely to increase as health promotion programs become more community oriented. Given the effectiveness of natural helpers and the important role they play within the community, more direct efforts have been made to identify and use natural helpers as change agents. The identification of natural helpers has become an important task for health care providers[1-3].

Literature indicates several methods used to identify natural helpers such the reputational-method, self-nominated method, self-rating methods, snowball method, and ethnographical methods. Despite its strengths and weaknesses, all are very subjective[4,5]. Attempts to enhance the objectivity of NH identification tool has been published by Stahl (2005)[6]. However, his tool focuses on NH in general sense. Therefore, the present study was to develop and validate the instrument for identifying natural helpers for health area, the natural helper characteristic scale (NHCS).

Material and Method

The present study was approved by the Faculty of Public Health, Mahidol University Ethical

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Review Committee (MUPH 2011-003) before conducting the mixed methods design, which divided into two phases: identifying core constructs of the natural helper characteristics in health area, and assessing the quality of the NHCS developed based on the identified core constructs.

The first phase: identifying characteristics of natural helper for health area

Multi-methods including an in-depth interview and literature review were conducted. Data on natural helper characteristics were collected from key informants who are community leaders and health professionals working with natural helpers who had health experience. The in-depth interviews were conducted with 27 key informants from 4 rural sub-districts in four regions of Thailand including North, Northeast, Center, and South. The sub-districts were purposively selected based on the experience in organizing a health projects which gained public recognition. The 27 key informants from 4 sub-districts were selected through a snowball sampling method in which the investigator started identifying key informants based on the criteria of the study. The criteria are a community health fund committee or sub-committee member and who has much information or knowledge of the people in the community. The key informants then identified additional subjects based on the same criteria.

The in-depth interviews aimed to describe the characteristics of natural helpers. Community health worker, community health volunteer and natural helper published studies from databases: PubMed, CINAHL, Science Direct, and ProQuest were reviewed. The data analysis of the in-depth interview and literature review data were analyzed using Miles and Huberman Framework (1994)[7].

The characteristics drawn from the in-depth interviews and the literature reviews have been validated with the 27 key informants using telephone interview to confirm the common characteristics. The core characteristics of the natural helper on the basis of being chosen by more than 80% of all the key informants were identified. This set of core characteristics has been used to design the questions for the NHCS.

The second phase: assessing the quality of the tool, NHCS, in terms of validity and reliability

Cross-sectional survey was conducted with 655 community participants using multistage stratified sampling procedures to select the sample and the number of samples. Twenty-four provinces were selected by simple random sampling from each four regions. Of twenty-four selected provinces, 21 provinces responded. From each of selected provinces, a random sampling of 2 sub-districts was conducted in each selected province. The total of sub-districts was 48. Of forty-eight selected sub-districts, 39 sub-districts responded. Purposive sampling of community health fund committee members who are representatives from community people and village health volunteer of the selected community.

Construct validity using factor analysis on data from a survey of 655 community participants, 310 in the Exploratory Factor Analysis, and another 345 in the Confirmatory Factor Analysis. Concurrent validity has been tested for "intrapersonal construct by using Stahl's NHM[6] as the reference, for family and social constructs, validation from family and health professional surveys had been employed.

Construct validity of the NHCS was tested using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Four different exploratory factor analytic techniques-(1) Principal Component Analysis (PCA) with varimax rotation, (2) Principal Component Analysis (PCA) with oblique rotation, (3) Principal Axis Factoring (PAF) with varimax rotation, and (4) Principal Axis Factoring (PAF) with oblique rotation-were used to determine the best factor solution for the NHCS, with the 40-item scale in a sample of 310 participants to explore the dimensions of the NHCS. From the Predictive Analytics Soft Ware (PASW) Statistics, 18 were used for Exploratory Factor analysis. The Maximum Likelihood estimation method incorporated in the Analysis of Moment Structures (AMOS), 18 software programs was used to conduct a confirmatory factor.

Results

The first phase

The core characteristics based on Phase One, classified in terms of domain, theme, and sub-theme are presented in Table 1.

The second phase

Assessing the quality of the tool, NHCS, in terms of validity and reliability

The first draft contained 28 items for nine themes. These were validated by five academic experts, and five community experts. The content validity index (CVI) was 0.95. For readability and clarity, the first draft

Table 1. Summary of domains, themes, and sub-themes of the core characteristics of the natural helper

Domains	Themes	Subthemes	Percentage of "needed to have" characteristic chosen by the telephone interviewees (n = 27)
Intrapersonal domain	1.1 Mental readiness characteristics	A. Giving	100%
		B. Being willing to help	100%
		C. Being sensitive and responsive to other's need	100%
	1.2 Openness to new experiences	A. Experiential learner	92.6%
		B. Constructive learner	81.5%
	1.3 Personality	A. Having self confidence	96.3%
		B. Enthusiastic personality	96.3%
		C. Honest personality	96.3%
		D. Friendly personality	96.3%
	1.4 Leadership	A. Being a good model for others	88.8%
		B. Being a good mediator	81.5%
		C. Having visions and initiative	81.5%
Family domain	2.1 Readiness of family members	A. Family relationship	96.3%
		B. Supportive behavior from family members	96.3%
	2.2 Economic readiness		92.6%
	2.3 Time readiness	A. Able to organize oneself and his/her family until having free time to serve others	92.6%
		B. Ability to provide continuing support	81.5%
Social domain	3.1 Acceptance in the community	A. Being a leader or a core member of a successful community program/project in the past	88.9%
		B. Gaining high level of collaboration or participation from the community	88.9%
	3.2 Having social networks	A. Having many relatives or friends belonging to various community groups	88.9%
		B. Making contact with the networks continuously	88.9%

was scrutinized by five community experts who are Village Health Volunteers (VHVs). As a result, seven items were dropped; fifteen items were revised. In addition, nineteen new items were added. Thus, 28 items of the first version were increased to 40 items in the second version. The second draft has been pre-tested; the results showed that the value of Cronbach's coefficient alpha overall scale is 0.94.

The results of EFA showed five factors contained 30 items that accounted for 62.24% of the variance. The first factor contained 7 items. The second factor (6.97% of the variance) included 8 items. The third factor (5.17% of the variance) contained 6 items. The fourth factor (4.89% of the variance) contained 5 items. The fifth factor contained 4 items, which accounted for 3.98% of the variance.

The CFA reflected that the 5-factor solution with 24 items was the best fit for the data. After using the Maximum Likelihood estimation method incorporated in the Analysis of Moment Structures (AMOS), 18 software programs were applied to confirm the best model as shown in Table 2.

The five factors of the NHCS were analyzed further by group name as shown in Table 3. Factor 1, namely "Altruism", consisted of five items, with factor loadings ranging from 0.53 to 0.78. Factor 2, namely "Openness to new experiences", consisted of three items, with factor loadings ranging from 0.65 to 0.85.

Table 2. Summary of fit indices of the 24-item version of the NHCS

Measures of fit information	Criteria*	Modified 5-factor model (24-items)
Chi-square value	-	439.91
Probability for Chi-square	ns (p>0.05)	<0.001
d.f.	-	217
Ratio of Chi-square/d.f.	<3.00	2.02
Goodness of Fit Index (GFI)	>0.90	0.90
Comparative Fit Index (CFI)	>0.95	0.96
Normed Fit Index (NFI)	>0.90	0.92
Tucker-Lewis fit index (TLI)	>0.90	0.94
Root Mean Square Error of Approximation (RMSEA)	<0.06	0.05
Standardized RMR	<0.08	0.018

* Source: Chadcham (2004: 28-30)[8]

Factor 3, namely "Role recognition", consisted of three items, with factor loadings ranging from 0.67 to 0.75. Factor 4, namely "Family readiness", consisted of three items, with factor loadings ranging from 0.67 to 0.86. Factor 5, namely "social acceptance", consisted of six items, with factor loadings ranging from 0.71 to 0.86.

Concurrent validity testing has been done in three different constructs: intrapersonal, family and social constructs. The intrapersonal construct includes Factor 1 (altruism), 2 (openness to new experiences) and 3 (role recognition). Results of interpersonal construct validation by Pearson correlation analysis with the NHM (stahl)[6] indicated significant moderate correlation ($r = 0.40- 0.44$, $p<0.01$) from a sample survey of 548 individuals.

For the "family readiness" factor, the Independent t-test was done to determine significant differences in the mean score obtained by self-assessment and family-member assessment. The results indicate that the "family readiness" factor had no statistically significant difference between self-rating and family-rating ($p = 0.579$).

For the "social acceptance" factor, the Independent t-test was done to determine significant differences in score between self-rating and public health personnel-rating. The results show that the "social acceptance" factor had a statistically significant difference of mean scores ($p = 0.043$) between self-rating and public health personnel rating. The mean score of this factor indicates that self-rating had a higher score than that of the public health personnel-rating (mean scores = 25.37 and 22.53 respectively).

Internal consistency reliability

The NHCS is considered reliable since Cronbach's alpha for the overall scale was 0.93. The alphas for each factor showed that the alpha coefficients of most factors were higher than 0.70 with the exception of "role recognition" which had an alpha of 0.66. Corrected item-to-total correlations were all acceptable at the criterion level of 0.30 (ranging from 0.45-0.89).

Test-retest reliability

The temporal stability of the NHCS was examined. The second measure of the reliability of the NHCS was evaluated for the test-retest reliability. The 2-week test-retest reliability using Pearson's coefficient ranged from 0.81 to 0.98 indicating that all factors had a high reliability ($r>0.70$). The summary index of the NHCS also demonstrated a high level of 0.98 ($p<0.01$), signifying its stability over a short time period.

Discussion

The NHCS has demonstrated promise as an instrument for identifying natural helpers in the health area for the Thai context. The NHCS demonstrated evidence of content[9-12] and construct validity[8,13], and adequate internal consistency and test-retest reliability[14-16].

Concurrent validity when comparing with Stahl NHM indicated a moderate relationship between scores on the NHCS and the NHM, which might result from their measuring different aspects of intrapersonal characteristics. The NHM was developed based on the general aspects of the natural helper characteristics, which were not specifically related to health projects, whereas the NHCS was developed based on specific characteristics for the health area, which contained some constructs broader than the NHM. The two instruments might share similarities only on the altruism

Table 3. Standardized item loadings for confirmatory factor analysis of 24-item version of NHCS

Item	Factor Loading
Factor 1: Altruism	
Item 1. You pay more attention to others' problems or public issues even though they may be the trivial.	0.77
Item 2. You want to help the others when you know that they suffer or when you realize problems occurring in your community.	0.71
Item 3. You want to help or do something to make others or community happy.	0.69
Item 4. You are willing to sacrifice something likes money, asset, physical exertion or time in order to make others feel better or happy or to improve your community.	0.66
Item 5. You know that people in your community usually come to ask you for help.	0.55
Item 7. You always give something likes physical exertion, information or time, to others more than you take it back.	0.69
Factor 2: Openness to new experiences	
Item 14. You can use your knowledge or experience to do health promoting activities in a community for example, arranging exercising, elderly activities, or behavior-changing activities.	0.72
Item 15. When you work, you usually seek the new information or learn the new things.	0.65
Item 16. You usually take notes or summarize your knowledge or experience.	0.57
Item 17. you usually teach or exchange your knowledge or experience with others.	0.91
Factor 3: Role recognition	
Item 19. Your friends, close relatives or acquaintances usually perceive that you are enthusiastic.	0.72
Item 20. Your friends, close relatives or acquaintances usually perceive that you have good human relations.	0.69
Item 22. In working to promote health in the community, you have to work with others; you usually are a good role model for the others in community and it makes them trust and want to cooperate with you.	0.78
Factor 4: Family readiness	
Item 25. You are very close to members in your family.	0.78
Item 26. Members of your family support you verbally in participating in health promoting activities such as exercising, elderly activities, and behavior-changing activities.	0.70
Item 29. You can work/participate in community's activities or public's activities even though you have more duties in your occupation such as, routine work, harvesting season, rubber tapping period etc.	0.81
Item 30. You can manage your time to work/participate in community's activities or public's activities continually.	0.84
Factor 5: Social Acceptance	
Item 33. You know well about most of the people in your community.	0.59
Item 34. You know a lot of information about the resources within your community.	0.86
Item 35. You can extensively and comprehensively motivate all people in your community to participate in health promoting activities.	0.85
Item 36. Apart from those in your community, you still have friends or relatives outside your community who are willing and ready to help you and your community.	0.80
Item 38. From your work that you have done for the community, you feel that you are well accepted by your community members.	0.81
Item 39. If you need your community to assist you with fund raising, you think that your community is willing to cooperate fully.	0.77
Item 40. If you need your community to help you in giving opinions, you think that your community is willing to cooperate fully.	0.75

characteristic (Table 4).

Family domain was assessed by having a family member of the selected sample to rate the items across the family domain based on their opinion. The

Table 4. Comparison item statement of the NHM and the NHCS on the intrapersonal domain

Natural helper measure (NHM)-3 items	NHCS-intrapersonal domain
	Altruism
1. I often find myself helping others with their problems	Item 1. You pay more attention to others' problems or public issues even though they may be the trivial
2. I consider myself to be "naturally" good at helping others	Item 2. You want to help the others when you know that they suffer or when you realize problems occurring in your community
3. I am comfortable helping others with their problems	Item 3. You want to help or do something to make others or community happy
	Item 4. You are willing to sacrifice something likes money, asset, physical exertion or time in order to make others feel better or happy or to improve your community.
	Item 5. You know that people in your community usually come to ask you for help.
	Item 7. You always give something likes physical exertion, information or time, to others more than you take it back.
	Openness to new experiences
	Item 14. You can use your knowledge or experience to do health promoting activities in a community for example, arranging exercising, elderly activities, or behavior-changing activities.
	Item 15. When you work, you usually seek the new information or learn the new things.
	Item 16. You usually take notes or summarize your knowledge or experience
	Item 17. You usually teach or exchange your knowledge or experience with others
	Role recognition
	Item 19. Your friends, close relatives or acquaintances usually perceive that you are enthusiastic
	Item 20. Your friends, close relatives or acquaintances usually perceive that you have good human relations
	Item 22. In working to promote health in the community, you have to work with others; you usually are a good role model for the others in community and it makes them trust and want to cooperate with you.

results revealed that the NHCS scores on family domain did not differ when compared with self-assessment and family-member assessment. This finding can be explained by the fact that family members have the same opinion as the sample respondents as an insider view.

Social domain was assessed by means of a public health professional survey. It is noteworthy that the NHCS scores on social domain differed between the score from self-assessment and the score from public health personnel assessment. This can be explained by the fact that there are differences between views of the samples themselves and the public health personnel as outsiders. Therefore, it is suggested that social domain should be assessed by members of the community.

The final version was composed of 24 items with a five-value Likert scale. The possible scores on the 24-item NHCS range from 24 to 120. A higher score indicates higher tendency to be a real natural helper for the health area. This instrument can be helpful for health care professionals or researchers who are interested in identifying and working with natural helpers to improve effectiveness of health programs. A future study is needed to provide evidence and strengthened support for the validity and reliability of the NHCS in other areas or specific health-related issues.

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Potential conflicts of interest

None.

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การพัฒนาแบบวัดคุณลักษณะจิตอาสา: เครื่องมือค้นหาผู้มีจิตอาสาสำหรับงานด้านสุขภาพในบริบทของประเทศไทย

นรีมาลย์ นีละไพจิตร, ชะนวนทอง ธนสุกาญจน์, ภรณี วัฒนสมบูรณ์, ณัฐกมล ชาญสาธิตพร

ภูมิหลัง: *อาสาสมัครสาธารณสุข (อสม.) เป็นที่รู้จักมานานตั้งแต่มีนโยบายสาธารณสุขมูลฐานในปัจจุบัน อสม. ได้รับการสนับสนุนค่าตอบแทนรายเดือน ทำให้มีผู้ต้องการในการเข้ามาเป็น อสม. เป็นจำนวนมาก ดังนั้นการคัดเลือก อสม. ที่มีจิตอาสาและมีความพร้อมในการทำงานด้านสุขภาพที่มีความเที่ยงตรงและแม่นยำจึงมีความจำเป็น*

วัตถุประสงค์: *เพื่อสร้างและทดสอบคุณภาพของแบบวัดคุณลักษณะผู้มีจิตอาสาด้านสุขภาพ*

วัสดุและวิธีการ: *การศึกษาครั้งนี้ใช้รูปแบบการศึกษาแบบพหุวิธี เพื่อค้นหาคุณลักษณะจิตอาสาสำหรับงาน ด้านสุขภาพที่เหมาะสมกับประเทศไทย ด้วยการสัมภาษณ์เชิงลึกผู้นำชุมชนและเจ้าหน้าที่สาธารณสุข ที่มีประสบการณ์การทำงานกับจิตอาสาที่มีความสำเร็จในการทำงานด้านสุขภาพคุณลักษณะจากการสัมภาษณ์ ที่จะได้รับการตรวจสอบจากผู้ให้ข้อมูลอีกครั้งด้วยการสัมภาษณ์ทางโทรศัพท์เพื่อยืนยันคุณลักษณะที่สำคัญของจิตอาสาทางด้านสุขภาพก่อนการทดสอบทางสถิติด้วยการวิเคราะห์ปัจจัย และความเที่ยงของเครื่องมือโดยใช้สถิติ การวิเคราะห์สัมประสิทธิ์แอลฟาของครอนบาช*

ผลการศึกษา: *จากการศึกษาเชิงคุณภาพพบ 3 คุณลักษณะหลักที่สำคัญของจิตอาสา และจากการวิเคราะห์เครื่องมือ วัดคุณลักษณะจิตอาสาด้วยการวิเคราะห์องค์ประกอบเชิงสำรวจพบว่า ประกอบด้วย 5 ปัจจัย โดยมีข้อคำถาม 30 ข้อ ได้แก่ 1) การชอบช่วยเหลือ 2) การรับรู้บทบาท 3) การใฝ่เรียนใฝ่รู้ 4) ความพร้อมทางครอบครัว และ 5) การได้รับการยอมรับทางสังคม เมื่อทำการวิเคราะห์องค์ประกอบเชิงยืนยันพบว่า เครื่องมือวัดคุณลักษณะจิตอาสาที่ประกอบ ด้วย 5 ปัจจัย ข้อคำถาม 24 ข้อ มีความสอดคล้องกับข้อมูลเชิงประจักษ์อยู่ในเกณฑ์ดี (χ^2 = 439.91; df = 217 ($p<0.001$); χ^2/df = 2.02; RMSEA = 0.05; GFI = 0.90 and CFI = 0.96) โดยทั้ง 5 ปัจจัยนี้ มีค่าความเชื่อมั่นชนิดความสอดคล้องภายในของทั้งเครื่องมือ 0.94*

สรุป: *เครื่องมือนี้มีค่าความตรงเชิงเนื้อหา ความตรงเชิงโครงสร้าง และความเชื่อมั่นชนิดความสอดคล้องภายในที่ดี และยอมรับได้ เครื่องมือวัดคุณลักษณะจิตอาสาที่สร้างสามารถนำไปใช้ในการนำไปประยุกต์ใช้ในการค้นหาและคัดเลือกผู้มีจิตอาสา ในการทำงานพัฒนาสุขภาพ*