

# SOCIAL SUPPORT FOR MEDICATION ADHERENCE AMONG THAI PEOPLE WITH POST-ACUTE MYOCARDIAL INFARCTION: FACTOR ANALYSIS

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## ABSTRACT:

**Background:** The aim of this study was to modify the Enhancing Recovery in Coronary Heart Disease (ENRICH) Social Support Instrument (ESSI) in order to obtain assessment of social support for medication, because, whereas ESSI assesses general social support, a specific tool is needed for assessing social support for medication adherence, including assessment of the validity and reliability of this adapted version of the questionnaire.

**Methods:** Responses to the 12-item modified version of ESSI were collected from 348 Thais with post-acute myocardial infarction. None of 12-items violated any assumption for the factor analysis. The appropriateness of data for factor analysis was tested and then factor analysis was performed.

**Results:** Factor analysis comprised two components for determining the social support for medication adherence: the emotional and information support (nine items; items 1, 2,3,4,5,6,7,8, and 9) and the instrumental and appraisal support (three items; item 9, 10, and 12). The instrument used showed adequate validity and reliability.

**Conclusion:** The modified ESSI showed acceptable validity and reliability. This instrument may be used to evaluate social support for adherence to medications among Thais with post-acute myocardial infarction.

**Keywords:** Instrument; Social support for medication adherence; Thai

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## INTRODUCTION

The effect of social support remains to be one of the important predictors of prognosis in coronary artery disease (CAD) patients [1-4]. Social support is broadly defined as the existence or availability of people on whom one can rely on, cared about, valued, and loved [5]. Moreover, social support has also been referred to as the mechanisms by which interpersonal relationships in an individual's social network buffer against a stressful environment [6]. CAD patients with greater practical support were more likely to achieve medication adherence and was associated with better clinical outcomes over 4.5 years [3]. Furthermore, Khuwatsamrit [7] and Polsook [8] demonstrated that social support had a

positive effect on adherence to self-care requirements and recommendations among CAD patients.

Social support has been positively linked with medication adherence across different chronic illnesses [4]. Myocardial infarction (MI) patients with greater practical support were more likely to have good medication adherence. Additionally, Molloy et al. [3] found that practical support predicts medication adherence and attendance at cardiac rehabilitation following acute coronary syndrome. Similarly, in a meta-analysis, DiMatteo [9] demonstrated that social support was an important factor benefiting health by buffering stress, influencing a positive affective state, changing behavior, and also influencing the ability to adjust to and live with illness.

There is no general agreement with regard to a precise definition of social support. However, social

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support refers to post-acute MI patient's perception of help regarding medication adherence in aspects of emotion, instrumental, information, and appraisal support that they received from family, caregivers or health professions. The ENRICH Social Support Instrument (ESSI) assesses the four defining attributes of social support: emotional, instrumental, informational, and appraisal [5].

Emotional support refers to the provision of caring, empathy, love, and trust.

Instrumental support refers to the provision of help in both tangible ways such as finance, labor, or time and service forms.

Information support refers to the information provided to another during a time stress that is useful for problem solving.

Appraisal support refers to the communication of information that is relevant to self-evaluation.

Therefore, this study will employ the ESSI to measure social support in post-acute MI patients. This instrument assesses and covers the defining attributes of social support and its applicability has been described previously [1, 5]. In addition, this instrument has demonstrated acceptable psychometric properties and has shown to correlate positively with other social support instruments [5]. Moreover, the format used Likert scale for item responses that appropriate to measure perceived social support. Thus, social support in post-acute MI need the instrument that specific, high validity and reliability, appropriate number of questions and format, and consist of social support that cover very dimension of social support in post-acute MI patients.

Lortajakul [10] translated the ESSI into a Thai version and was tested its reliability with post-MI patients. Reliability analysis for the back-translated ESSI version was reported with internal consistency of .96. However, the Thai version used to measure only social support but nonspecific to measure social support for medication adherence as well. Thus, the researcher modified the ESSI to assess social support specific to medication adherence among post-acute MI Thai patients. The MESSI was used to evaluate the four attributes of social support: emotional, instrumental, informational, and appraisal. The MESSI was used to elicit data that revealed social support in medication adherence of post-MI Thai patients, focusing on those that had occurred in the prior week.

This specific tool is needed for the assessment

of social support in medication adherence. The assessment tool should be logical and comprehensible in order to aid participants in answering the questionnaire. To evaluate the social support in medication adherence in post-acute MI, a specific instrument is needed that has high validity and is reliable with an appropriate number of questions and format. Thus, a modified version of the ESSI was tested in Thai with post-MI.

## METHODS

This study used secondary data from the research of factor influencing medication adherence among post-acute myocardial infarction persons [11]. The study involved the factor analysis was tested for reliability of an instrument for assessing social support for medication adherence among Thai with post-acute myocardial infarction. Simple random sampling was used to approach the participants. The participants were recruited from all various parts of Thailand including the Northern, Southern, Central, and Northeastern regions [12] with approval from the Chulalongkorn University ethics committee (Approval code no. 0782012) and the Institutional Review Board (IRB) of each hospital. The data of 348 participants were included in the analysis, which is the met for statistical power for factor analysis [13].

## INSTRUMENT

The original ENRICH Social Support Instrument (ESSI) translated into Thai version by Lortajakul [10]. In this study, the researcher modified the ESSI to assess social support specific to medication adherence among Thai with post-acute MI patients. The self-administered of MESSI questionnaire was used to evaluate the four attributes of social support: emotional, instrumental, informational, and appraisal. The MESSI was used to elicit data that revealed social support in medication adherence of Thai post-acute MI patients, focusing on those that had occurred in the prior week, which was rated in Likert format as occurring 1 (none of the time) to 5 (all of the time). The total MESSI score was obtained by summing all four attributes of social support, with possible scores ranging from 12 to 60 points. A higher MESSI score indicated higher social support in medication adherence [10, 11, 14]. Internal consistency, using Cronbach's of 0.88 [1, 5, 11]. The intra-class correlation coefficient was 0.94, reflecting excellent reproducibility.

**Table 1** Demographic of 348 patients with post-MI

Characteristics	Number	%
<b>Age (years)</b>		
20-40	26	7.5
41-60	156	44.8
≥ 61	166	47.7
<b>Gender</b>		
Male	212	60.9
Female	136	39.1
<b>Marital status</b>		
Single	29	8.3
Married	248	71.3
Widowed	63	18.1
Divorced	8	2.3
<b>Education level</b>		
Non education	28	8.0
Primary school	195	56.0
High school	63	18.2
Higher than high school	62	17.8
<b>Financial status</b>		
Less than 5,000 Baht/ month	272	78.1
5,001-10,000 Baht/ month	50	14.4
10,001-15,000 Baht/ month	0	0.0
More than 20,000 Baht/ month	26	7.5
<b>Occupation</b>		
Do not work	137	39.4
Private employee	89	25.5
Government employee	5	1.4
Government pension	16	4.6
State enterprise	3	0.9
Business	49	14.2
Government official	20	5.7
Agriculture	29	8.3
<b>Health security</b>		
None	3	0.9
Universal Coverage Scheme ( the 30- Baht Scheme )	249	71.5
Social security	37	10.6
Government security	59	17.0

### Reliability and validity of study

#### *Content validity*

Content validity was determined by five experts: two cardiologists and three nursing instructors. The experts were asked to rate the level of relevancy between the items and the definition of the concepts as represented. A four-point Likert-type scale ranging from 4 (strongly relevant) to 1 (Strongly irrelevant) was used to rate each item. The Content Validity Index (CVI) was calculated for MESSI.

#### *Reliability*

The reliability of the MESSI tool was tested. For internal consistency, a Cronbach's alpha coefficient  $> .70$  was considered satisfactory. The homogeneity of the MESSI was tested by item-total and inter-item

correlation coefficients. An item-total correlation coefficient  $> .30$  was considered acceptable. For inter-item correlations, coefficients between  $.30$  and  $.70$  were considered acceptable; a coefficient  $< .30$  indicated that items were not present in the tool, whereas a coefficient  $> .70$  indicated repetition [13].

#### *Construct validity*

Principal component analysis (PCA) extraction and rotation by varimax method were applied for extracted factors. For extraction and conceptual consideration, the criteria determined factors extraction which was Eigen values  $> 1$ , a scree plot, and all of the cumulative percent of variance extracted. Factor loadings  $\geq 0.4$  were defined as sufficient to determine a factor [13, 15].

**Table 2** Total variance explained and communalities (n = 348)

Component	Initial eigenvalues			Rotation sums of squared loadings			Communalities
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	
SS1	7.960	66.331	66.331	5.965	49.709	49.709	.750
SS2	1.035	8.624	74.954	3.029	25.245	74.954	.852
SS3	.814	6.781	81.735				.835
SS4	.403	3.362	85.098				.862
SS5	.367	3.059	88.156				.663
SS6	.314	2.620	90.776				.745
SS7	.276	2.299	93.075				.686
SS8	.261	2.171	95.246				.698
SS9	.192	1.604	96.850				.743
SS10	.163	1.361	98.211				.798
SS11	.117	.979	99.190				.638
SS12	.097	.810	100.000				.725

### Data collection

The investigator conducted the study at a cardiology clinic altering permission to access the subjects. The researcher presented the benefits/risks of the intervention and the protection of human rights in nontechnical terms, to obtain approval from the patients to participate in the study. If the patient met the inclusion criteria and agreed to participate, then he or she was asked to sign a consent form. The interview process took approximately 30-45 minutes to complete. Participants were then asked to complete the MESSI questionnaire. During data collection, participants were able to refuse or leave without any consequence. Data collection took place from December, 2011, to February, 2013 [11].

### Data analysis

The Statistical Package for Social Science (SPSS) program version 17 (University license) was used to analyze data. Descriptive statistics and factor analysis were obtained for the MESSI. An alpha level of .05 was set as the accepted level of significance for this study.

## RESULTS

### Characteristics of sample

A total of 348 participants who were post-acute myocardial infarction patients were included in this analysis [11]. The findings revealed that most of the participants' age was  $\geq 61$  years old (47.70%). They were predominantly male (60.9%), married (71.3 %), and more than half of participants completed primary school (56 %). Moreover, almost one-thirds of the participants (39.4%) do not worked. In addition, more than three quarter of the participants (78.1%) had salary less than 5,000 baht

(1 US dollar = 30 baht). Most of the participants (71.5%) used Universal Coverage Scheme (the 30-Baht Scheme). The findings regarding demographic of the study participants are summarized in Table 1 [11].

### Reliability and validity

#### *The degree of relevance and content validity*

The average degree of relevance for the questionnaire items used in this study was 90%, which indicates that the modified version of ESSI was an accurate reflection of the English version. The content validity index (CVI) was found to be .91, which indicates a good level of content validity for the modified version [15].

#### *Reliability*

The Cronbach's alpha of MESSI version was .92. Item-total and inter-item correlation coefficients were also tested ( $r = .51$  to  $.91$ ,  $r = .38$  to  $.88$ , respectively), that was very good discrimination ( $>.3$ ) [13]. The appropriateness of data for factor analysis was tested before Principal component analysis was performed. The correlation coefficients was  $>.3$ . The sampling was adequate for factor analysis (Kaiser-Meyer-Oklind value = .94). Bartlett's Test of Sphericity indicated a sufficient correlation matrix among the variables ( $X^2 = 4013.497$ ,  $df = 66$ ,  $p = 0.00$ ).

Principal component analysis extraction method was used for extract factors. The MESSI was orthogonally rotated by varimax rotation (Table 2). Two factors explaining 74.95% of the total variance were identified. Communalities in each factor ranged from .64 to .86. Factor 1 and factor 2 explained 49.71% and 25.25% of the variance (Table 2). Overall, the appearance of the

**Table 3** Factor analysis with varimax rotation of the modified the ENRICH social support instrument (n = 348)

Items	Dimension	
	1	2
1. I have someone available to takes care of me when I was at home	.841	
2. I have someone available to listen to me when I need to talk	.878	
3. I have someone available to shows me love and affection	.871	
4. I have someone I can trust and rely on when I need	.881	
5. I have someone available to help when I have financial problems	.725	
6. I have someone available to help with daily chores	.810	
7. I have someone available to advise about medication prescribe	.663	
8. I have someone available to help taking medication	.645	.531
9. I have someone available to help when I was worried about taking medication	.563	.652
10. I have a doctor and a nurse to give good advice about side effects and helping make a difficult decision of medication		.875
11. I have as much contact as with someone I feel close to such as parents, siblings, relatives, and friends	.693	
12. I have as much contact as with health care team in whom I can trust when I want		.799

Note. Factor loading > .40 are in boldface

factor structure was reasonable and explainable. Factor 1 had nine items reflecting the emotional and information support which high factor loadings (>.60). Factor 2 had three items that captured the instrumental and appraisal support. Nevertheless, this factor explaining only 25.25% but it was a clear-cut indicator of variable and relatively good described (Table 3). Additionally, item 8 and 9 also exert co-loading effect on factor 2.

## DISCUSSION

The limitations of this study, all participants had been diagnosis with post-acute myocardial infarction and were being follow-up. As a result, the finding cannot be generalized to others such as those with heart failure or cardiac surgery. Further studies are required to measure the use of the MESSI for medication adherence among other group of patients with chronic illness. However, reliability and validity of the MESSI are acceptable to measure the social support for medication adherence among Thai with post-acute MI. The Cronbach's alpha for MESSI acceptable value as of .92 for overall scale. The overall ranges of the item-total and inter-item correlation coefficients were appropriate ( $r = .51$  to  $.91$ ,  $r = .38$  to  $.88$ , respectively), and it consist with the original version. A factor analysis of modified version of ESSI revealed two components of the social support for medication adherence: emotional support and information support. The modified version was found to be inconsistent with the original version, which included four dimensions: emotional support, instrumental support, information support, and appraisal support. Because

of the significant differences in culture and health care system; medication adherence between Thailand and western countries, it is essential to reflect this in the items discussing a patient's instrument and appraisal support for medication adherence. Thai people generally have extended families so most participants live with family members. It is likely that family members participated in their care and supported medication adherence for these patients [14]. Additionally, they have got access to medication without pay because Thai health care covers all citizens and participants believe in their doctors who care for them thus they tend to follow their doctors' instructions [14, 16]. Some items showed co-loading effect between instrumental support and information support of modified version such as I have someone available to help taking medication and I have someone available to help when I was worried about taking medication. All items in first domains of the modified version were all items of the first and second domain of the original version which was emotional and instrumental support. However, all items reflected social support for medication adherence. Furthermore, both versions testing based on attribution of social support by ENRICH; enhancing recovery in coronary heart disease center [5]. Thus, for Thai with post-acute MI, the modified version of ESSI was found to be a reliable and valid assess of social support.

## CONCLUSION

The reliability and validity of modified the ENRICH social support instrument (MESSI) was

appropriate for measuring social support for medication adherence among Thai post-acute MI. Even though the component of factor analysis were different between modified version and original version, the items of the modified version were measure the same as those attribution of social support in the original version. This instrument and the knowledge contained in this paper may be used by nurse and others to identify and assess social support among Thai post-acute MI, as well as to get information in order to enhance social support for medication adherence.

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