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Content

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Editorial : Writing an Appropriate Methods Section for a Research Article: Design, Ethical Considerations and Sample

Over the years, while editing numerous manuscripts, we have noted a consistent problem exists regarding the manner in which the method section, of research articles, is written. All too often crucial content is missing and, thus, the reader is unable to truly understand what the researcher did. If the method section of the article is poorly written, not only will the reader not understand what was done, but no one can replicate the researcher's work, since no one will know what actually had been done.

In general, the method section, of a research article, needs to contain the following elements: design, ethical considerations, sample, procedure, instruments or measurements, and data analysis. Each of these elements will be discussed, over the next two issues of the *Thai Journal of Nursing Research.* In this issue, we will focus on what needs to be included in the: design, ethical considerations and sample components of the method section of a research article.

Design: The design component of the method section needs to briefly indicate what type of design was used in the study. For example, if the study was qualitative in nature, the author needs to indicate the approach used (i.e. phenomenology, grounded theory, historical, ethnography or participative action research.). Since several of these qualitative approaches have varying ways of implementing the analysis of the data, the author needs to indicate clearly the specific approach used. For example:

> If phenomenology was used, was the analytical approach Heideggerian or Gadamerian?
>
> If grounded theory was used, was the analytical approach based on the work of Glaser and Strauss, or on the work of Corbin and Strauss?

If a quantitative research project was conducted, the author needs to explicate the type of design used. For example, was the research design: descriptive; correlational; quasi-experimental; experimental; or, non-traditional?

- If the design was descriptive, was it a typical descriptive, comparative descriptive or time dimensional design?
- If the design was correlational, was it descriptive correlational, predictive correlational or model-testing?
- If the design was quasi-experimental, was it a type of a non-equivalent group design, or an interrupted time-series design?

- For an experimental design, was it a: classic experimental design; post-test only control group design; randomized block design; factorial design; nested design; cross-over or counterbalanced design; or, randomized clinical trial design?
- Finally, if the research design was non-traditional, was it a: primary prevention and health promotion study; secondary analysis; meta-analysis; or, methodological design?

It is possible for a researcher to use a mixed design, and utilize both a quantitative and a qualitative approach. If this occurs, the author must indicate that a mixed design was used and explain what type of quantitative and qualitative approaches were implemented. For example, the researcher may have implemented a predictive correlational design, using specific survey instruments, but also interviewed the participants, using a grounded theory approach.

It is essential for the author to clearly identify what research design was used, in his/her study. This is necessary so the reader will be prepared for what to expect in the procedure component of the method section of the research article.

Ethical considerations: Whenever human or animal subjects are used, in a study, ethical considerations are required. Since most nursing studies use human subjects, rather than animal subjects, we will address only ethical considerations related to human subjects. The author must indicate that consent to engage in a study was obtained from his/her institution (i.e. university, hospital, or clinic). In most situations this means that the author has obtained approval, to gather data, from the institution's Human Assurance Committee. In addition, depending upon the research sites (hospital, clinic, school, etc.) used in the study, approval also may be required from these organizations' Human Assurance Committees or from the organizations' appropriate administrative officers. It is essential that the author indicate that approval to gather data was granted, both by the researcher's institution and by each research site, prior to any form of data gathering.

In addition to indicating approval was obtained from the researcher's institution and each of the data gathering sites, the author is required to indicate that consent, either verbal or written, was obtained from each research subject, prior to his/her involvement. In addition, the author must state that each subject was informed of the following: the purpose of the study; what would be involved, if the subject agreed to become part of the study; how much of the subject's time would be required in order to participate in the study; his/her confidentiality and anonymity would be maintained; and, that he/she could withdraw, from the study, at any time, without negative repercussions.

If survey questionnaires were used, for data gathering, the completion of the questionnaires serves as the subject's consent to participate, as long as the questionnaires cannot be identified with any specific subject. When questionnaires are used, the author needs to indicate whether code numbers, instead of the respective subjects' names, were placed on the completed questionnaires for the purpose of identification.

If an interview of a subject was part of the research procedure, the author needs to indicate if it was done in private, and how the subject's confidentiality and anonymity was maintained. Additionally, anytime a subject has been tape recorded, as part of the research, the author must indicate whether the subject gave verbal or written consent to be recorded.

When children have been part of a research project, the author must reveal whether their respective parents signed a consent form granting approval for their children to participate. In addition, it must be clearly indicated that each child, if he/she is old enough to understand, received an explanation, just as is done with adult subjects, regarding what will be involved in the study and what rights he/she has regarding the study. Even though a parent may grant approval for his/her child to participate, in a study, the child may not want to be involved. Thus, the author must indicate whether children, who are old enough to understand, signed an assent form, in addition to their respective parents signing a consent form.

Sample: In all research articles, the author needs to provide a comprehensive description of the study's sample, so when readers examine the research findings, they have a thorough understanding of what type of individuals generated the data that were obtained. Knowing what a study's subjects were like assists other researchers and readers of the research article to determine how applicable the findings are to their research, or to their particular work situation.

Information about the sample that must be addressed includes: who was studied; how the subjects were identified and contacted; the location of the subjects; the subjects' inclusion criteria; how many subjects were involved in the study; how many subjects either dropped out of the study or were excluded from the study; information about why subjects dropped out or were excluded; the characteristics of the subjects (age, education, income, gender, information specific to the study, etc.); and how many (number and percentage) subjects were in each characteristic category. The sample's characteristics may vary greatly depending upon the nature and focus of the study. The sample characteristics can be put either into a table format or described in the narrative of the article. However, the narrative and the table should not repeat the same information, since doing so is redundant.

Summary: The design, ethical considerations and sample components of the method section of a research article are only some of the important content that is required. Having well developed design, ethical considerations and sample components in the method section of a research article greatly enhances the possibility of having one's article accepted for publication, in an English language journal. If these components, of a research article, have been poorly developed, a reviewer will question the author's ability to adequately explain exactly what was done during the research process.

In the next issue of the *Thai Journal for Nursing Research*, the editors will discuss what needs to be addressed in the procedure, instruments or measurements, and data analysis components

of the method section of a research article. Authors need to recognize that the likelihood of having their manuscript accepted for publication is enhanced if ALL parts of the research article are well written and thoroughly developed.

We, as editors of the *Thai Journal of Nursing Research*, look forward to you submitting your research manuscripts for consideration for publication in the *Thai Journal of Nursing Research*.

Vickie A. Lambert, DNSc, RN, FAAN
Clinton E. Lambert, PhD, RN, CS, FAAN

Environment for Scholarship and Journal Impact Factor in Thailand

Shaké Ketefian, Somchit Hanucharurnkul

Abstract: An increasing number of institutions, internationally, are requiring their faculties publish in journals with high impact factors (IF), and providing various types of rewards to motivate scholars to do so. The literature describes appropriate and inappropriate uses of such policies. Thus, this study, as part of a five country study, aimed to explore, in Thailand: (a) the extent to which institutions are requiring faculty to publish in high impact journals, and (b) how the pressure of publishing in high impact journals influences a nurse scientist's choice of topic for investigation, and the development of nursing science. The design was qualitative, using a questionnaire designed to obtain respondent views. One senior faculty member, from each of the seven nursing doctoral programs in the country, was invited to participate; five did so. Objective responses were summarized and descriptively presented. Content analysis was used for narrative responses.

Results indicate that faculties were expected to publish in high IF journals. The faculties stated this led to: competition instead of cooperation; and, authors wanting to publish in journals of other countries, so as to bring prestige to their institutions. However, they felt this does not contribute to resolving health problems of the country, and further enumerated the hurdles and positive outcomes of the policy. They said Thai scholars study health problems of the country, and frame the practical applications of their work, in terms that might be of interest to their country, as well as to other countries. Results were discussed and interpreted in view of current realities in Thailand.

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Keywords: Impact factor uses; Nursing science; Publications; Scholarship, Thailand

Background Information

Institutions of higher learning, throughout the world, are seeking to improve their offerings, research, and standing nationally and internationally. This has led to competition and search for objective measures to assess quality of various aspects of their educational programs, especially as it relates to the output of faculty, in the form of their publications. The development of bibliometric measures, such as the impact factor (IF), which is intended as a measure of a journal's impact; and citation analysis, which is the number of times a scientific article is cited by others,[1] have spurred the interest of academicians, and are being used for a variety of purposes.

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Some universities are requiring faculty members to publish in high IF journals; using rewards, such as cash bonuses, to spur faculty members in this regard; and are using bibliometric measures in faculty hiring and promotion decisions.[2] Despite caution having been expressed about unintended uses of such measures, institutions of higher learning are using them in making individual faculty decisions, such as in: hiring and promotion; institutional rankings; determination of research funding to individuals and/or institutions/departments; and, national priority setting.[3] Some authors have decried this tendency.[2, 3]

Professionals often have complained that the peer review process does not take into account the social utility of published papers, while those who practice, and provide services to the public, recognize that social relevance is a major concern.[4] In addition, the way a journal's IF is used, as a measure of the quality of an individual's article, or of a scholar's body of work, has raised concern among some scholars. For example, an investigation of the predictive validity of journals' IF scores, in the hiring and promotion decisions of social work faculty, was found to have a low effect, and led the researchers to conclude their findings did not justify using journal IF scores in hiring and promotion decisions.[5]

The relationship between the quality elements of journal articles, and the frequency of citations of articles in four psychiatric journals, was found to have an IF of 0.88 – 11.2, over a 9-year period.[6] Quality features, such as: statistical errors; reporting of sample size; poorly reported research questions; and, the primary outcome of the study, were found not to be related to the citation counts. However, some of the quality features were related to the visibility and prestige of the journal (in this case, two of the four journals with high IF scores). The investigators concluded the latter findings were due to detailed author guidelines and rigorous peer reviews, which are characteristic of high IF journals.[6]

The Thai Journal Citation Index Centre created a national system for evaluating journals published within the country.[7] This evaluation is conducted yearly, with national and international journals being ranked according to established criteria. The Thai Commission of Higher Education provides funding for journals which are highly ranked, as well as national journals which are determined to have the potential to improve their quality to meet the criteria to become international journals. In order for a journal, published in Thailand, to be classified as an international journal, it must: be published in English; be listed in an international data base; have at least 25% of its editorial board comprised of scholars from other countries; have at least 25% of the authors of papers published in the journal be from outside Thailand; and, have 25% of its reviewers for each issue be experts from outside Thailand. On the other hand, in order to be classified as a national journal: 25% of a journal's editorial board members must have the academic rank of professor or have a doctoral degree; 25% of the published papers, in each issue of the journal, must be from outside the institution that publishes the journal; and, 50% of the reviewers for each issue must be from outside the institution that publishes the journal. At present one Thai nursing journal is classified, based on the established criteria, as an international journal.[7]

Thailand was selected as one of the countries for this study, due to the emphasis it places, as a result of governmental and institutional policies, on academicians having articles published in a high IF journal. It is important to study the effects such policies have on the work of scholars who conduct research, as well as to address the broader question of how such policies influence the production and direction of nursing science.

Research Questions

Many countries face similar situations as Thailand, yet there have been no studies in nursing that address how the behavior of scholars is affected, or more importantly, how constraints imposed by national or institutional policies affect the development of nursing science. This investigation, as part of a five country study, aimed to address this vacuum in our understanding. Thus, the research questions investigated were:

1. To what extent are selected institutions in Thailand requiring their faculties to publish in high impact factor journals?
2. How do the pressures to publish in high impact factor journals, influence the behavior of individual nurse scientists, choice of topic for investigation and development of nursing science?

Method

A descriptive inquiry, using a qualitative survey design, was conducted regarding: the extent to which journals' impact factors are used in Thailand as the venue for faculty publications; the purposes for which such information is used; how selected nurse scholars perceive the consequences of prevailing practices; and, how their perceptions regarding the consequences of prevailing practices influence various decisions.

Study subjects. Five senior academic nurses, one from five of the seven institutions of higher learning which offer doctoral degrees in nursing in Thailand, participated. A key informant provided country-specific information regarding the institutional ratings, or rankings, as well as identified senior faculty to be solicited to participate. The key informant was a senior academic, holding the rank of professor in a major university, who has held offices in professional organizations over many years, and had overall familiarity with nursing programs in the country, as well as being familiar with nurse leaders. The respondents held the rank of professor or associate professor and, due to their faculty rank, were familiar with their respective institution's policies and the state of nursing science in Thailand, had taught in doctoral programs, and had published in international journals. To obtain the respondents, one potential participant, who met the selection criteria, from each of the seven nursing doctoral programs, in Thailand, was invited to participate.

Procedure. Institutional Review Board (IRB) approval was obtained from the institution of the first author. Due to the low risk posed by the study, the IRB required that a letter, with the elements of informed consent, for information only, instead of a signed consent form, be provided to all potential respondents. Seven identified individuals, one from each doctoral program, were invited to participate through an approved letter, which provided relevant information about the study and included all elements of informed consent. Once individuals agreed to participate, they received the questionnaire and were asked to return it within three weeks. All communication occurred electronically. Several reminder letters were sent over an eight week period, which resulted in five responses being received.

Study instrument. A survey questionnaire, containing 21 items, was developed by the investigators, based on review of the literature, for use in the collection of data regarding the extent and purposes for which institutions and systems in Thailand make use of the impact factor of journals in which faculty members have published. The questionnaire further sought to explore the ramifications and effects the use of the impact factor of journals have on individual scholars and the development of nursing science.

A draft of the questionnaire was reviewed

by four individuals from five countries, for clarity and relevance of the items to the study questions. These individuals were senior faculty in research universities, who also served as journal editors in their countries. Revisions of items were made, based upon the reviewers' comments; thus, the questionnaire had content validity. Eleven questions presented a list of statements as options, five asked for yes/no responses to be checked, followed by a request for comments. The "comments" section was provided to enable respondents to explain and shed light on their choices. Five questions required narrative responses. It was estimated that it would take 30-40 minutes to complete the questionnaire.

Data Analysis. Data were analyzed via content analysis and descriptive statistics, through the use of frequencies. The participants' objective responses were summarized and described. For comments and narrative responses, content analysis, established by Wilson,[8] was used to elicit meaning from the text and identify categories that emerged.

Wilson[8] established three basic elements of content analysis: (1) deciding on the unit of analysis; (2) borrowing or developing the set of categories; and, (3) developing rationale and illustrations to guide coding of data into categories. *Deciding on the unit of analysis* means a decision needs to be made whether the whole response, or a breakdown of responses into separate words, phrases, or sentences, will be used. *Borrowing the set of categories* means a set of categories can be developed before data collection, if the concepts are borrowed from existing theory; data can be coded using the pre-identified categories. In this study, the set of categories, for the content analysis, were "borrowed," as they were primarily derived from the questions asked in the questionnaire. *Developing rationale and illustrations to guide coding of data into categories* means in order to code data into categories, the investigator has to "make a judgment on the right category for every response or unit of analysis." [8(p470)]

The analysis process was done manually. Many respondents provided the same answers to questions pertaining to citation counts as they did for impact factor. To avoid redundancy, the authors have not focused on citation counts.

Results

Results were described and organized around categories relevant to the study's questions. The bracketed numbers refer to the number of respondents who checked each respective statement.

Context: All respondents agreed that the concept of journal metrics, in the form of expectation that faculty publish in high impact factor (IF) journals and achieve high citation counts for their publications (citation counts are the basis for computation of IF), was in use in Thailand. Further, the respondents indicated these practices were promulgated and used by the Ministry of Education and university administrators. Other government agencies also were mentioned as using such information, especially those concerned with research funding and quality assurance of universities. However, respondents did not indicate nursing schools required their faculties to publish in high IF journals. The five respondents indicated several uses of information on publication in high IF journals, including: assurance of the institution's high ranking in national/international surveys [5]; measurement of individual faculty productivity [5]; measurement of collective faculty productivity [4]; measurement of a journal's quality [4]; and, measurement of overall quality of a department or school [3]. In addition, faculty publication in journals with a high IF served as the basis for obtaining funding for a faculty member's doctoral students.

How scholars' behavior is influenced by the existing policy: Respondents were queried on their views regarding the extent to which the policy, on

requiring publication in high IF journals, influenced the behavior and decisions of scholars. The respondents stated there was strong competition, among colleges, to be published in high IF journals [4]. Such pressure leads most scholars to publish in journals from other countries, rather than their own [4], and to publish in high quality journals, regardless of a journal's IF [2].

The respondents were queried further on their perspective of publishing in national versus international journals. They indicated that those who publish: nationally are addressing domestic health problems [4]; internationally add prestige to their institutions and country [4]; internationally are not providing the country the benefit of the researchers' findings [3]; and, in high IF journals focus on problems of interest to those journals, rather than on the interest of the country [3].

The effects of the existing policy and perceived hurdles: Respondents were asked to provide their views on the effects of the existing policy to publish in high IF journals, and seemed to agreed: graduate schools have improved research training overall [5]; there is greater methodological rigor seen in research [4]; and, published works have become stronger in their theoretical grounding [3]. Hurdles mentioned were: insufficient English language skills [5]; topics that interest scientists are not of interest to some journals [5]; and, those who attended graduate school overseas are more successful in publishing internationally [5]. Also mentioned were that: English-speaking authors and English language journals, as well as authors from disciplines outside of nursing, do not cite Thai nursing authors' work; computation of IF does not take into account various forms of scientific publications; the emphasis on the IF can have the effect of suppressing the pursuit of innovative research directions that could be culturally relevant; and, there are too many ways to raise a journal's IF, making it an artificial measure.

Perceptions of nursing science in Thailand: Respondents were asked to assess the current published works in Thailand. They stated that they: are responsive to health needs of the country [5]; frame the practical application of their work in terms of the health problems of the country [5]; involve replication of work done elsewhere to determine the relevance and applicability to local needs [5]; present research that is of interest to the investigators, but not of value to the local population [4]; and, frame the practical application of their work, in terms of health problems of interest, to other regions of the world [3].

Efforts to internationalize Thai journals: Respondents provided information that Thailand has clear criteria that must be met prior to a journal being considered to be national or international. They stated: international members have been appointed to Thai journal manuscript review panels [5]; scholars in Thailand have accepted positions as assistant/associate editors, or members of review panels, for journals in other countries [4]; and, these steps have changed the profile of Thai journals, by strengthening their quality.

Discussion and Recommendations

Respondents generally had a good understanding of what was being asked. They were able to describe advantages and disadvantages regarding the use of IF. However, they identified more disadvantages regarding the use of IF to them, and to nursing, than they did advantages. All indicated that no Thai journals currently were listed in the *Web of Science (WoS)*, or had an IF assigned. At present only one Thai journal, the *Thai Journal of Nursing Research*, is considered "international" by the criteria established by the Thai Journal Citation Index Centre.

The respondents stated IF computations are biased heavily toward English language journals.

This criticism appears justified when one reads the publications of various disciplines in the country.

All agreed Thai university administrators place a high degree of emphasis on faculty publications for academic rank, prestige and funding decisions. However, it is puzzling that they did not feel that nursing schools placed the same degree of emphasis on faculty publications, compared to government and university administrators. While faculty members, from the basic sciences and medicine, have international publications, the respondents stated that Thai nursing faculty do not have international publications and are unfamiliar with the requirements of international journals. These statements are puzzling since many Thai nurse scientists have studied, at the graduate level, in English-speaking countries, and have been socialized in the matter of publishing internationally. Given the availability of electronic websites, where author guidelines are available for the various journals, it is a puzzle as to why nurse faculty would not familiarize themselves with manuscript requirements of international journals.

The constraints faculty members face, in their efforts to conduct research and achieve publication, need to be recognized. The first constraint is the fact that faculty do not have support systems to facilitate their scholarship, and must do their own secretarial work. The second constraint is the nursing shortage, in Thailand, has lead to the enrollment of larger numbers of students, which has increased the faculty workload. Finally, the teaching of some master's level specialties are offered only on weekends, leaving faculty little time for scholarly activities.

A number of other findings were similar to those found in the literature.[4, 9, 10] For example, respondents indicated there are important disciplinary variations that are not accounted for in the computation of IF. They felt these computations needed to be standardized, so that meaningful comparisons can be made. Respondents also pointed out that the IF does not measure the quality of individual articles, but simply indicates journal status. Therefore, to make a generalization about an individual article from the overall journal status, is a misuse of the IF score, and can lead to erroneous conclusions about a specific article. The respondents also noted that the IF does not address the value of the research for patient care and application to real world problem solutions, a critical consideration in nursing.

Respondents noted the trend toward publication in high IF journals can lead to research that is more responsive to models, paradigms and themes valued in other countries. Such a research focus may or may not contribute to solutions of local health care problems; whereas those who publish locally contribute to solving health problems of the country. However, we do not know to what extent this is the case, as no examples were provided.

Thailand currently does not have any journals listed in the *WoS*, nor with an IF assignment. All of the respondents were in favor of international efforts, now under way, to increase the listing of Thai journals in the *WoS*, but it is not clear whether the respective editors of the journals are submitting applications to have their journal so listed. The respondents felt such listing would bring about a wider dissemination of Thai research to those in other countries, as well as to members of other disciplines.

Anecdotally obtained information revealed that many schools of nursing, in Thailand, publish their own journals, typically with local or national circulation. Some of them do not meet the criteria to be considered a national journal, and none meet the established criteria for international journals. However, there are eight journals, in Thailand, that meet national standards, and one that meets international standards, although it is not listed in the *WoS*, nor has an IF assignment.

From the reported data, it can be concluded a great deal of nursing research is being carried out, but only is published locally. Local publications do not have international visibility, and, thus, have limited impact beyond the country. Respondents mentioned that nurse and non-nurse scholars in other countries do not cite Thai nurses' published works. One of the reasons for this is that scholars outside of Thailand often do not have access to local or national Thai publications. It is suggested, therefore, that schools of nursing, in Thailand, consolidate their energies and resources, and jointly publish fewer journals of high quality, with a view to establishing international reputations for the journals.

Thai universities have, for a long time, emphasized the importance of having graduate students, especially those enrolled in doctoral programs, attain competence in the English language, regardless of whether the students are studying within the country or overseas. The reason is that much of the advanced literature students need to access, for their work, is published in English. The fact that some researchers' lack of sufficient English language skills, gets in the way of publishing in international journals, remains unclear. This factor requires future examination.

Limitations

This study has several limitations. The first is that the questionnaire presented options to check, and, thus, was a "recognition" task, rather than a "generation" task, with ideas derived from the literature. It is possible the respondents' task was made easier, in that they could check an item if it appealed to them, whether or not they knew it to be true. In addition, it is not clear whether the same ideas would have emerged had the participants been asked to generate the ideas, rather than recognize them.

Two other limitations were the qualitative/descriptive design and the small sample size. Neither of these factors enabled the use of statistical procedures or provided a basis for generalizations. Therefore, if deans and faculties wish to better understand the phenomenon examined in this study, it will be necessary to design a study that has a national scope.

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Quality of Diabetes Care in PCUs in Central Thailand

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Abstract: This descriptive study, using a mixed method design, sought to describe, within Central Thailand, the quality of diabetes care in terms of the structure of Primary Care Units (PCUs), care processes for diabetics and outcomes of diabetic care; and the relationships among these factors. Three hundred health care providers from 300 PCUs completed a researcher-designed questionnaire which sought information regarding the structure and care processes, used in the PCUs, with diabetics. Outcomes of diabetic care were assessed using fasting plasma glucose reports obtained from the PCUs. In addition, 9 care providers, who completed the questionnaire, served as key informants, for in-depth interviews, which validated and further explained the quantitative data. Quantitative data were analyzed using descriptive statistics and Pearson's product moment correlation, while qualitative data were examined by way of content analysis.

Almost one-quarter of the PCUs met all components of structure, based upon PCU standards. Results revealed the structure of most PCUs were sufficient in terms of facility, financing and networking. Although the majority of staff consisted of nurses, the PCUs were considered insufficiently staffed, and 825 demonstrated improper preventive care. However, 43% of the diabetics, being cared for in the PCUs, showed sound glycemic control.

Good PCU structure suggested an increase in the likelihood of appropriate care processes and corresponding positive outcomes. In addition, the presence of well- trained health volunteers provided assistance to the PCU staff, particularly when professional staffing levels were low. Thus, a need for an increase in the number of professional staff in PCUs, enhanced training for health care volunteers and revision of the standards of diabetic care was evident.

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Key words: quality of diabetes care, primary care units, Thailand

Background and Significance of the Problem

Diabetes mellitus represents a significant public health problem in Thailand, with a prevalence rate ranking three times higher than the global average.[1] In 2000, the prevalence of diabetes, among Thai adults, was reported to be

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9.6% of the population. Furthermore, reports from recent health status surveys reveal that only 40% of Thai people with diabetes are able to maintain appropriate glycemic control.[2] However, control of glycemic rates in patients' cared for in one of Thailand's Primary Care Units (PCUs), which were set up to address primary care under the Universal Coverage Insurance Plan, have been found to be worse than the national average.[3] While evidence suggests 38% of diabetics attending PCUs have glycemic control,[3] the glycemic control rates at PCUs, in Central Thailand, were found to be 29.5 %.[4]

In addition to enhancing significant factors that improve diabetic health, the organizational structure of the health care system has been found to be a major contributing factor in good diabetes management.[3] As a result of the reform of Thailand's health care system, emphasis has been placed on the quality of primary health care delivery, including the care of diabetics. Using the guidelines established by the Thai National Health Plan of 2008, the PCUs have focused on quality of care.[5] Nurses play a major role in providing individuals with diabetes quality health care, including: service delivery, health promotion, health prevention, and coordination and continuity of care. All these factors serve as indicators of the delivery of quality care.

Factors that reflect the quality of care for diabetics can be grouped into the categories of: organizational structure; processes of care; and, care outcomes. Previous studies, regarding organizational structure, have found that finance,[6, 7] human resources,[8, 9] equipment[10] and networks[11, 12] positively influence the process of care. Adherence to guidelines for diabetes management, in terms of processes of care, also has been found to improve the outcome of care,[13, 14] while continuity of care has been shown to be associated with higher glycemic control rates.[15, 16] In addition, evidence suggests that coordination, such as referrals, is positively associated with care outcomes of individuals with diabetes.[17]

Organizational structure, processes of care and care outcomes also have been identified as key factors in quality of care.[18, 19] Since most studies have been conducted in Western countries, the quality and outcome of the care, in response to these standards, remains unclear in Central Thailand. Thus, the purpose of this study was to describe the quality of diabetes care in terms of the structure of PCUs, care processes for diabetics and outcomes of diabetic care, as well as to determine the relationships among these factors, in Central Thailand.

Method

Design: The study was descriptive in nature, using both quantitative and qualitative methods, undertaken within two phases. In Phase I, the quantitative portion of the study, the primary researcher obtained data by way of a structured questionnaire, regarding the PCUs' structure, diabetes care processes and diabetes care outcomes. In addition, 6-month fasting plasma glucose (FPG) reports of patients receiving care in the participating PCUs were obtained. Phase II, the qualitative portion of the study, involved in-depth interviews of 9 health care providers, each from a different PCU, who were selected from the survey sample and represented varying degrees of experience. The interviews were conducted in an effort to extend an understanding of the diabetes care phenomena.

Instruments: The quality of diabetes care was assessed by way of a, 85 item, researcher-designed questionnaire based on the: standards set forth for Primary Care Units;[20] Standards and Indicators for Setting up PCUs;[21] and, Diabetes Care Guidelines for Practitioners in PCUs.[22] The 3 part questionnaire sought information regarding the PCUs: (a) staff demographics and reports on

participating patients' FPG; (b) structure; and, (c) diabetes care processes. Part one of the questionnaire consisted of 15 items, which sought general information about the demographics of participating PCUs, as well as their monthly reports of patient FPGs. Examples of questions were: "What kind of PCU is this?" and, "How many diabetics visit the clinic daily?"

Part two of the questionnaire consisted of 30 items, which requested information about the structure of the facilities, as well as the financial, staffing and networking aspects of the PCUs. Examples of questions included: "Does your PCU have a glucose test machine?" and, "Have you received up to date diabetes mellitus training?

Forty items, in part three of the questionnaire, sought data regarding the PCUs diabetes care process, specifically service delivery, continuity of care and coordination. Examples of questions were: "How many times did you visit people with diabetes at their home last year?" and, "Does the PCU have a counseling system?"

Consideration was given to the format of the questionnaire to ensure that it was user-friendly and easy to complete. A check list was used in Parts I and II. The items which represented the standard level of performance were rated as 1, while items failing to met the standard were rated as 0. A Likert-like scale was used in Part III. Items which were positively stated were rated as 1 for 'strongly agree' and 5 for 'strongly disagree.' Items which were negatively stated were rated as 5 for 'strongly agree' and 1 for 'strongly disagree.'

The researcher developed an interview guide, after the quantitative data were gathered, to obtain in-depth qualitative information about: how health care providers administered diabetes care; provision of services: continuity of diabetes care in the past year: and, what things were needed to provide quality care. The interview guide consisted of five open-ended questions, including: "How do you provide care for a diabetes patient?"; "What are the barriers to providing good diabetes care?"; "How do you manage such problems;?" and, "If you could change everything, what would you want to change in order to improve the quality of diabetes care?"

Seven experts in PCUs diabetes care and research were asked to review the questionnaire and interview guidelines for validity, understanding and practicality. Sixty-eight of the 85 items were considered valid; however, some wording was refined to make the questions more practical. Seventeen of the 85 items were deleted.

Once the questionnaire was finalized, a pilot study was conducted, using 20 health care providers working in a PCU, for the purpose of testing the questionnaire's reliability and face validity. Participants were selected from health care providers who had a main responsibility in diabetes care in PCUs, in Central Thailand, which were not part of the study sample. Subjects, in the pilot study, were asked to assess comprehensibility of the wording of each item and determine which aspect of diabetes care quality was being measured by each item. Based upon the results, item wording was adjusted and similar items were placed under the specific factors being measured, in each of the three parts of the questionnaire.

The refined questionnaire consisted of 68 items. Part I consisted of 13 items regarding general information; while Part II consisted of 22 items regarding finance, facility, staffing and networking. The 33 items that made up Part III assessed service delivery, continuity of care and coordination. All items in the interview guidelines were justified as being valid. The content validity index (S-CVI) of the questionnaire was found to be 0.97, while the reliability, using Cronbach's alpha, was 0.86. Interpretation of the content, from the in-depth interviews, was validated with individuals who took part in the interview process.

Sample: The sample consisted of employees of PCUs in Central Thailand. The PCUs were randomly selected, using two stage cluster sampling. Inclusion criterion were: being an employee who worked in a PCU, managed by the Minister of Public Health (MOPH), and providing care to individuals with diabetes. Since the National Health Security Office divided the area of Central Thailand into 6 zones,[23] the steps of the two-stage sampling involved the following: 1) randomly selecting a province from each zone; 2) randomly selecting 50 PCUs from each selected province; and, 3) identifying employees, at each selected PCU, to serve as respondents, to the questionnaire, for their respective PCU.

Using Yamane's formula,[24] a sample size of 295 participants was considered adequate for completing the questionnaire. However, to assure an adequate return rate, 325 questionnaires were distributed. Three hundred, usable, questionnaires were return, for a return rate of 92.3%.

The majority (n = 251, 83.7%) were female with an average age of 36 years. Nearly all (n = 245, 81.7%) had a bachelor's degree in nursing or public health. Most (n = 289, 96.3%) reported the structure of their PCU had been developed from the health posts to meet MOPH standards, while only 3.7% (n = 11) of the PCUs were newly established within a hospital. An average of 64 diabetics were registered in each of the PCUs, with a range of 2 to 575 (SD =75.20) individuals with diabetes per PCU.

In addition, a total of 9 employees served as key informants for the in-depth interviews. The informants were interviewed until no new categories, concepts, dimensions or incidents emerged[23] from the data. They represented 9 PCUs, had a broad range of experiences[24] and were identified from the completed and returned questionnaires. Five key informants were selected from PCUs that provided the best diabetes care (i.e. highest glycemic control rates among all PCUs in the study). Four key informants also were selected from PCUs with the lowest glycemic control rates among all of the PCUs in the study. The key informants were purposely chosen to reflect the gender, average age, average level of education and average work experience characteristics of the 300 questionnaire respondents.

Ethical considerations: Approval to conduct the study was granted by the Committee on Human Rights Related to Human Experimentation at the primary researcher's university. Each participant was informed about: the study's purpose; what was involved in participating in the study; maintenance of participants' anonymity and confidentiality; and, the right to withdraw, at any time, without negative repercussions. Informed consent was obtained from all participants and key informants. All participants were asked to sign a consent form before they completed the questionnaire or were interviewed. Anonymity was maintained by placing code numbers on the completed questionnaires after they were returned to the primary investigator. Confidentiality was addressed by keeping the completed questionnaires in a locked file and viewed only by members of the research team.

Procedure: Survey data were obtained from October 2007 through February 2008, while interview data were obtained between April and June 2008. The procedure for obtaining data consisted of two parts.

Part I: The primary researcher requested permission, by way of a formal letter to the Director of the Provincial Health Office, to collect data. After approval was granted, the Coordinator of each provincial public health office was called so as to build a relationship, explain objectives of the study and request assistance in collecting data. The researcher and each Coordinator then created a timetable for collecting data together.

Data were collected the days the monthly provincial meetings with healthcare providers,

working in each PCU, were held. After the meeting, at the provincial health office, the researcher and/or the coordinators explained the objectives of the study and requested the healthcare workers informed consent. Those who gave consent to participate were given the questionnaire and asked to complete and return it that day. It took an average of forty-five minutes to complete the questionnaire. The participants also were asked to save, on a researcher provided CD, their FPG data or to copy the FPG data and send it, via mail or e-mail, to the researchers.

Part II: After the quantitative information were analyzed, appointments were made, telephonically, with the participants working in the PCU with the lowest, as well as the PCU with the highest glycemic control rates, as compared with the sample value, to conduct in-depth interviews. Seven participants were interviewed, in private, at his/her respective PCU. Two participants were interviewed, by phone, to reduce interviewer effect, since one interviewee was a former student of the primary researcher and one was the researcher's classmate. An interview guide was employed, as needed, during the interviews. Each interview was audio-taped, and lasted approximately one-half hour. During the interviews, changes sometimes were made changes in data collection techniques, i.e. re-wording questions, changing the sequence of questions, and/or modifying the interview locations. Field notes were written regarding interactions, observations and occurring events, as soon as possible, after each interview.

The researcher performed member checks, after each interview, so as to provide the respective participant an opportunity to confirm and/or clarify the researcher's interpretation of the interview data. Sometimes, new data emerged and was recorded.

Data analysis: Descriptive statistics were used to analyze contents of the questionnaire, while Pearson's product moment correlation was carried out to examine correlations among the structure of PCUs, care processes for diabetics and outcomes of diabetic care. Each interview was recorded and transcribed, wherein, content were analyzed, via descriptive categories, naming substantial phenomena and coding.[25]

Findings

PCU Structure: Over two-thirds of the PCUs had sufficient financial support for delivery of services for diabetics, and three-fifths o f them had sufficient financial support for coordination and continuity of care (Table 1). The major source of support was drawn from Contracting Units for Primary Care (CUP). PCUs with insufficient financial support searched for other financial support sources, i.e. donation boxes, local administrative organizations, national health security offices and other local organizations. However, information from the survey showed that over half (56.7 %; n =170) were unable to find additional financial support sources; wherein, the key informants explained that this was because they did not have good connections with other organizations. One key informant commented:

> "I didn't obtain funds from other financial support sources because I didn't know the sub-district administrator. I got my only budgetary funds from the hospital and it was not enough to visit patients at home"

Some 59.7 % (n = 179) of the PCUs had sufficient facilities for diabetes care in terms of both general office supplies and medical supplies. The PCUs could draw supplies from CUP and share supplies with other PCUs. All of them had blood glucose testing machines, and the vast majority had a sufficient amount of diabetic drugs

to prescribe in their clinic (Table 1). Those that needed additional facility supplies also could share supplies with other organizations. One key informant explained obtaining secondary supply needs as follows:

> "We used to have more glucose test strips, needles, and weight scales of our own. Sometimes, we can borrow things from other PCUs."

Sufficient staff were available in only 19 % (n = 57) of the PCUs, with only 9.7% (n = 29) having full-time physicians and 81% (n = 243) having full-time registered nurses. The standards, provided by the MOPH, regarding total number of staff members, was met only by 2.7% (n = 8) of the PCUs, with an average of 2-3 full-time staffs per PCU, including one to two nurses. Some CUPs supported the PCUs by rotating staff, at least once a month, from the CUP to work in one of the PCUs. However, only 57% (n = 171) of the participants reported their PCU received such staff support. Almost one-fourth (n = 71; 23.7%) of the PCUs reported that, even though they had support, they continued to experience staff shortages (See Table 1).

Table 1 Structure of primary care units (n = 300)

Quality of Care	Factors	Standard	PCU met the standard	
			N	%
PCU Structure	Financing	Budget for diabetes service delivery	208	69.3
		Budget for coordination and continuity of care	184	61.3
		Other sources of budget	130	43.3
	Facilities	Glucose test machine	300	100.0
		Family folder	282	94.0
		Safety & privacy clinic	267	89.0
		Diabetes mellitus drugs	250	83.3
		Computer databases	202	67.3
		Mission and goal	109	36.3
	Staffing	Staffs supported by the CUP	171	57.0
		Continuity of diabetes mellitus training	242	80.7
		Physician: Population1:≤10,000	22	7.3
		Nurse: Population1:≤1250	110	36.7
	Networking	CUP and other PCUs	300	100.0
		Community participation	235	78.3
		Local organizations	152	50.6
		Local people in community	300	100.0

CUP = Contracting Units for Primary Care
PCU = Primary Care Units

The key informants explained that, due to staff insufficiency, the PCUs could not provide quality care, nor provide certain procedures, i.e. home visits and/or health education. The PCUs managed this problem by training health volunteers to help nurses take blood pressures and weights, while managing their outpatient department (OPD) cards. One described the insufficiency of staff and quality of care as:

> "We had a lot of work, but we had only 3 staff members...This insufficiency of staff caused us to provide low quality care, as we could not perform everything that we were supposed to."

The key informants also explained that the major network, for sharing staff, knowledge and supplies, was the CUP. However, 23% (n = 69) of the participants indicated they had networks with local administrative organizations, and all reported having connections with health volunteers. Some of them stated health volunteers were able to help with home visits, referrals from the community and community-based disease surveillance.

Diabetes Care Process: The diabetes care process was explained in terms of service delivery, continuity of care and coordination. Only 35% (n = 103) of the PCUs provided proper service delivery, i.e. medical treatment, health prevention and health promotion, while 84.3% (n = 253) regularly provided proper diabetes treatment.

As shown in Table 2, 90.3% of the time, nurses in the PCUs administered, to those with a normal range blood-glucose level, the prescribed dosage of diabetic medication. This was done in accord with the clinical practice guidelines and under the physician's orders, without need for consultation with, or another order from, each individual's physician. However, for those unable to control their blood-glucose level, the nurses, 32% of the time, adjusted their medications according to the clinical practice guidelines or referred them, 47 .3% of the time, to the CUP, in accord with the clinical practice guidelines. One key informant's description of the medical treatment process was:

> "... If patients had high blood glucose levels, we would adjust drugs or refer patients to the CUP. Nurses could adjust diabetes drugs under the physician's permission or clinical practice guidelines...."

Although only 18.3 % (n = 55) of the participants indicated their PCU regularly provided preventive care, which met the clinical standards, 58% reported receiving annual triglyceride and cholesterol blood tests. Less than one-third (30%, n = 90) of the PCUs provided annual foot and eye examinations, while 19.0% provided HbA1Cc examinations at least once yearly, and 11.0% provided neuro-examinations, at every visit, in order to meet MOPH standards (See Table 2).

With respect to health promotion, all PCUs provided education to each diabetic, while only 35.3% reported providing diabetic care education to the families of the diabetics. Furthermore, 85% of PCUs provided proper continuity of care, and 82.0% had an appointment system and made appointments every 4-6 weeks for both poor and well glycemic controlled individuals. Health volunteers followed-up with those who missed appointments, by visiting them in their homes. One key informant described the follow-up system in this manner:

> "We had appointment registration in paper form. If patients missed their appointments for more than 1 month, we would follow-up on the patients by making calls or visiting the patients at home."

Some 69.3% of PCUs provided proper coordination services regarding referral and consultation. The PCUs referred those with poorly controlled glycemia (100%), new cases of diabetes (100.0%), emergency cases (66.0%), laboratory tests (56.7%) and diabetic patients with complications (78.0%). Key informants explained that full-time nurses consulted the respective physician and/or pharmacist regarding FPG levels between 100-126mg%, while managing those with complications and drug-related side effects.

Care Outcomes: As shown in Table 2, the outcome of care (See Table 2) was measured from the average six-month FPG level, of 19,141 diabetics who were seen in one of the 300 PCUs, with approximately two-fifths demonstrating good glycemic control (FPG = 100-126 mg%). The average FPG level was 147.10 mg% (min = 109.96 mg%; max = 190.71 mg%; SD = 16.27 mg%). A significant relationship was found between each of the components of the PCUs' structure and care processes, and the service delivery component of the process of diabetes care and outcome (See Figure I).

Table 2 Process and outcome of diabetes care in primary care units (n = 300)

Quality of Care	Factors	Standard	PCUs met standard	
			n	%
Care Process	Service Delivery	**Medical treatment**		
		Distribution of the correct diabetes mellitus drugs	253	84.3
		No long waiting for services	173	57.7
		Adjusted drugs under the monitoring of a physician	142	47.3
		Adjusted drugs using clinical practice guidelines	96	32.0
		Preventive care		
		Blood pressure examinations at least 4 times/yr	271	90.3
		Fasting blood sugar examinations at least 4 times/yr	246	82.0
		Triglyceride and cholesterol testing once a year	174	58.0
		Foot examination at least once a year	91	30.3
		Eye annual check-ups	90	30.0
		HbA1Cc examination at least once a year	57	19.0
		Neuro- examinations at every visit	33	11.0
		Health promotion		
		Individual health education	217	72.3
		Family education	106	35.3
	Continuity of Care	Out-patient department cards and report system	262	87.3
		Appointment system	246	82.0
		Continuity of health history to physicians	204	68.0
		Follow-up system	141	47.0
		Home visits 4 times a year	109	36.3

Table 2 (continued)

Quality of Care	Factors	Standard	PCUs met standard	
			n	%
	Coordination	A referral system for emergency cases	198	66.0
		A counseling system	180	60.0
		Patient information was referred	176	58.7
		Less than 60 minutes in transportation to refer	167	55.7
Care Outcome	Glycemic Control	Fasting plasma glucose < 126 mg%	8,227 (n= 19,141)	42.98

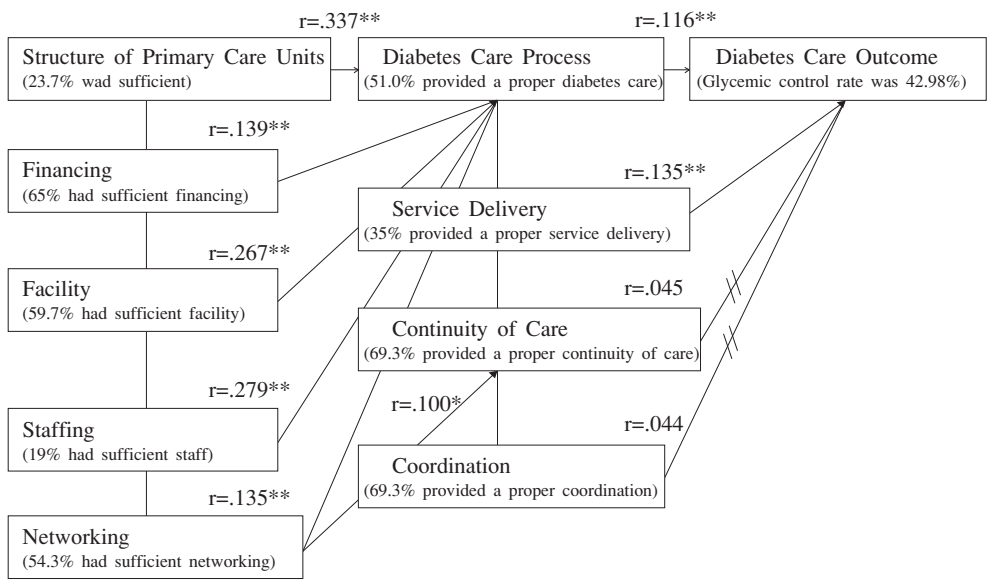

Figure 1 Relationships among the structure of primary care units, diabetes care process and diabetes outcomes

Discussion

The management of diabetes care failed to meet most of the required standards set forth for good diabetes management in PCUs, although care-giving standards have been recommended to assure individuals with diabetes receive quality care.[22, 28] One-third of those with diabetes had foot examinations once a year, while 11% had neurological examinations every visit, in accord with the standards. These results are similar to previous studies, in Thailand, wherein low rates of preventive care have been found among diabetics.[29] The findings, of this study, are similar to those of Dunn and Pickering,[30] Chin and colleagues,[31] Grant[32] and Saaddine and colleagues,[33] who found few creatinine and cholesterol tests, as well as foot and eye examinations, were performed in primary care.

The lack of suggested preventive care practice may be due to the shortage of available staffs in the PCUs. Since health care reform was instituted, the number of PCU staff positions has not increased; however, diabetes care has been extended to the PCUs. Thus, nurses have had to provide care, in the PCUs, be proactive in their communities and perform tasks beyond the role of nursing (i.e. general management and coordination with the community). This, in turn, has lead to nurses experiencing increased workloads.

Although an average of 64 diabetics/per day comes to the PCUs for care, there only are one to two health care providers available to deliver care. Thus, the nurses often are unable to provide preventive care for all with diabetes. These findings are congruent with those of previous studies, in Thailand, which have found the lack of staffs in the PCUs leads to a work overload for the nurses.[34, 35] The findings also are consistent with those of Davidson, Ansari and Karlan,[36] and Render and colleagues,[37] who revealed staff shortages to be associated with poor diabetes control.

In Thailand, an individual with diabetes, whether it is controlled or not, is scheduled to visit a PCU every four to six weeks. The frequency of the visits is slightly higher than recommended by the American Diabetes Association (ADA).[22, 28] However, the guidelines for quality practice recommends diabetics, with poor metabolic control, visit a PCU every one to two weeks.[22, 28] Unfortunately, in this study, this action was not being carried out. It appears the standards for diabetes care were not being done, due to the lack of adequate staff and the presence of a local organizational network.

Findings, of this study, reveal the staff shortages resulted in inadequate service delivery, especially in terms of improper preventive care (see Figure 1). However, given those limitations, it appears the health care providers provided proper health promotion and continuity of care, and achieved good care outcomes. This may have been due to the available network, wherein the health care providers had good relationships with health volunteers who helped them connect with the community.

The health volunteers also helped the health care providers with home visits and communication, which facilitated continuity of care, as well as the transfer of those with diabetes from the community to the PCUs. The findings demonstrated the increased role of volunteers, within the health care system, was the result of the primary health care project[38] launched in the late 20th century, wherein local people were encouraged to become involved in the health care system within their community. Finding that the involvement of the volunteers had a positive impact on the health care being delivered is congruent with Chuengsatiansup's[39] research, which suggested that health volunteers are an extremely valuable health resource.

Similar to Chuang's[40] findings, almost half of the diabetics utilizing the PCUs reached the desired level of glycemic control. When compared with the glycemic control rates found in studies conducted in Western countries,[33-35] the glycemic control rate found, in this study, was slightly higher. However, compared to the glycemic control rate found by Nitiyanant and colleagues,[29] the glycemic control rate, found in this study, was considerable higher. The fact the glycemic control rate, found in this study, was higher than that in other studies,[41] conducted in Thailand, may have been due to differences in the setting, as well as to the condition of those utilizing the specific health care institution. For example, in Thailand, those attending tertiary care facilities usually have more severe cases of diabetes than do those receiving care at a PCU.

The fact that a high glycemic control rate was found, in this study, may reflect the efficiency and effectiveness of the system and the staff members in the PCUs. The majority of health care providers were nurses and able to provide, within the primary care concept, diabetes care in the PCUs. Even though the existing work overload brought about improper service delivery, the glycemic control rate was compatible with rates found in Western countries. This suggests the primary care provided, by nurses, reduced costs, increased access to appropriate medical services for the population being served and did not reduce the quality of care being delivered.

The findings were consistent with those of prior studies which have suggest the structure of an organization has an important affect on health care performance and outcome.[29-31] These results also support Donabedian's[19] model, a well accepted method for setting standards in hospitals, which proposes that structures affect care processes, which in turn, affect care outcomes. The relationships among PCU structure, diabetes care processes and care outcomes, in this study, support the application of Donabedian's framework within the primary care settings in Thailand.

Limitations

One cannot apply the findings of this study without examining its limitations. Data were obtained exclusively from providers working within PCUs and did not address information from individuals with diabetes or their families. Furthermore, quality of care was assessed in terms of technical quality and did not include amenities or the interpersonal domain.

Implications

Based upon the study's findings, the following recommendations are suggested:

(1) The shortage of nurses working in PCUs, as well as nurses' current work overload need to be addressed.

(2) Nurses need to enhance the assistance of health care volunteers by providing them appropriate training. In addition, nurses continually need to foster relationships with key community leaders for the purpose of strengthening the organizational network.

(3) The standards of diabetes care, practiced in PCUs, should be refined to better address the level of quality care.

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Relationship among Maternal Depressive Symptoms, Gender Differences and Depressive Symptoms in Thai Adolescents

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Abstract: To examine the pattern of relationships among factors related to depressive symptoms in adolescents of mothers with depressive symptoms, the structural equation model of adolescent depressive symptoms was tested. The conceptual framework, for this study, drew on the Interpersonal Theory of Depression. Through use of stratified sampling, 460 Thai adolescents, and respective mother, were selected for participation. All adolescents completed the: Demographic Data Questionnaire; Center for Epidemiologic Studies Depression Scale; Rosenberg's Self-esteem Scale; Multidimensional Scale of Perceived Social Support; Maternal Supportive Behaviors Questionnaire; Negative Event Scale; and, Parental Bonding Instrument. Each mother completed the: Demographic Data Questionnaire; and, Center for Epidemiologic Studies Depression Scale. Data were analyzed using LISREL. A goodness of fit was obtained with the model. The adolescents' depressive symptoms accounted for over 60% of the variance.

A strong effect of maternal depressive symptoms on depressive symptoms among Thai adolescents, as well as on mediation by intervening variables, was found. The results also enhanced understanding of how to develop and target nursing interventions to prevent development of depressive symptoms, and optimize mental health, among Thai adolescents, when their mother suffers from depressive symptoms.

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Key words: adolescent depressive symptoms, social support, self-esteem

Introduction

The World Health Organization (WHO) has estimated that 121 million people suffer from depression, a major cause (60%) of suicide.[1] In addition, depression has been projected to comprise, by 2020, the largest disease burden, of all health conditions among women, and to rank second in the total yearly disability-adjusted life expectation.[1]

Depression and depressive symptoms, historically,

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have been considered disorders that afflict middle-aged and older persons.[2] Depression refers to a diagnostic term that meets set criteria in the Diagnostic and Statistic Manual of Mental Disorder (DSM-IV),[3] while depressive symptoms are defined as "a spectrum of cognitive, affective, behavioral and somatic phenomena that accompany an unremitting sad mood (p. 154)."[4] Adolescents and young adults, however, have been noted to be increasingly depressed and to seek treatment.[2] Prior studies have found an increase in the onset of depressive symptoms among individuals 15 to 19 years of age.[2] In the United States of America (USA), the prevalence rate of adolescent major depressive disorder (MDD) is estimated to range from 15% to 20%,[5] while the prevalence rate of depressive symptoms is known to be close to 30%.[5] In Thailand, the incidence rate of MDD, among Thai adolescents, ranges from 5% to 8%,[6] while the prevalence rate of depressive symptoms ranges from 20% to 67%.[7-9]

Review of Literature

Depressive symptoms are known to be predictors of depression, with 25% of adolescents experiencing a MDD within one year of developing depressive symptoms.[10] A diagnosis of depression during adolescence has been shown to be a predictor of a recurrence of depression during adulthood.[10] In addition, the occurrence of a MDD during adolescence, when compared to that on childhood-onset MDD, has been found to indicate a poorer prognosis.[6]

Review of the literature reveals a number of factors, which increase adolescents' risks of developing depressive symptoms, have been investigated, including whether their mother has depressive symptoms.[10, 11] In particular, adolescent offspring of mothers with depressive symptoms have been found to be twice as likely to develop a major depression, or dysthymic disorder, compared to adolescents of mothers who never have been depressed.[12]

Not surprisingly, mothers with depressive symptoms have been recognized to experience difficulties carrying out parental responsibilities, lack maternal confidence and present with hostility,[11, 13] as well as have difficulty dealing with interpersonal relations with their adolescent child.[13] Mothers who suffer from depression, also may appear unavailable, or insensitive, to their adolescent[11] and be less able, compared to mothers who are not depressed, to provide appropriate guidance and rule enforcement.[12] Adolescents living in such an environment have expressed being resentful of their poorly functioning mother.[13]

Yet adolescents who receive sufficient maternal warmth and support, from their symptomatic mothers, appear less likely to develop depressive symptoms.[13, 14] This may be due to the fact that, when their mothers are impaired and unable to provide needed warmth and support, their fathers, grandparents, or concerned friends or relatives step in and provide for them. Thus, it appears the power of warm and supportive parenting is a critical factor in decreasing the likelihood of development of depressive symptoms among adolescents of mothers who are depressed.[13]

Self-esteem also appears to be a protective factor in decreasing the likelihood of adolescents developing depressive symptoms. Those with a high level, compared to those with a low level, of self-esteem have been found to suffer fewer depressive symptoms when facing similar stressful situations.[15] However, in order to optimize resistance to depressive symptoms, one's self-esteem has been shown to need mediation by social support.[15, 16]

Although a number of studies, in Thailand, have examined the relationship of life stress, social support, self-esteem and depressive symptoms among adolescents, none could be located which

have predicted any pattern of associations among the various factors.[8] Furthermore, no studies could be located, in English language or Thai language publications, which have investigating depressive symptoms among Thai adolescents, in relation to their mothers having depressive symptoms.

Therefore, this study sought to: 1) explore the relationships and factors associated with depressive symptoms among Thai adolescents of mothers with depressive symptoms; and, 2) test, in at-risk adolescents, the meditational roles of life stress, social support and self-esteem associated with maternal depressive symptoms and adolescent depressive symptoms.

Conceptual Framework

The conceptual framework, for this study, drew on the Interpersonal Theory of Depression.[16, 17] The assumptions underlying the theory, proposed by Sullivan,[18] are there are two basic human needs: biological and psychological. Both of these needs are met by having an "interpersonal relation" with a "significant other." Such interaction is dynamic and acknowledges both individuals' biological and psychological needs.

According to Sullivan, without having interpersonal relations with a significant other, one may not be able to satisfy his/her basic human needs.[18] In the Interpersonal Theory of Depression,[16, 17] "anxiety" refers to an insecure feeling, or emotional discomfort, that derives from the person not satisfying his/her basic needs. "Self-esteem" refers to a feeling that emerges from one having a positive self-evaluation, which is obtained from having an interpersonal relation with a significant other and perceiving a positive evaluation from his/her significant other. The "positive evaluation" one receives from a "significant other" constitutes "emotional support," which is an important support that can be gained by having an "interpersonal relation," or role relation, with one's "significant other."[19]

Thus, from this perspective, the interpersonal relation process, or interaction, between a mother and her children, might influence the children's anxiety and self-esteem. In other words, the mental health of the mother may have an impact on the mental health of her children.

Methods

This study used a cross-sectional, correlational research design. Causal effects were examined via investigation of adolescents' experiences of living, based on lifetime retrospective ratings, with their depressed mothers.

Setting and Participants: Fifteen high schools were randomly selected from 103 high schools in Bangkok, Thailand. A stratified sampling technique was used to obtain 460 adolescents who were 15 to 19 years of age, able to read and write in Thai and residing with their biological mother, who could read, write and score 16 or higher on the CES-D scale.

In this study, the term "adolescents" refers to late adolescence, which is classified from a psychosocial perspective as one 15-19 years of age and enrolled in a high school, including a Mathayom 4-6 (level of high school which includes grades 10 to 12). The study's sample size was based upon Hair and colleagues[20] suggestion that a ratio of 10 respondents per each estimated parameter be considered appropriate for calculation of a structural equation procedure. Therefore, the minimum sample size was set at 460, since the study included 46 estimated parameters.

The adolescent subjects ranged in age from 15 to 19 years, with an average age of 16.53 (SD = 1.00). Almost three-fourths (74%) of them had a daily allowance of 51-100 baht/day (mean = 86.63; SD = 31.55).

More than half (53.9%) of the mothers were in the age range of 41 to 50 years, with a mean

age of 43.55 (SD = 5.38). Almost one-third of them had a family income of 5,001to10,000 baht/ month (mean = 17,782.19; SD = 41,107.68). Most (79%) were married, but had an insufficient family income (55.2%). Almost half (44.8%) of the mothers only had a primary education.

Procedure and Ethical Considerations: Permission to conduct this study was obtained from the Human Rights Related to Human Experimentation and Ethics Committee, of the primary researcher's university, and the School Board Committee of each of the 15 schools, where data were collected from November 2007 to March 2008. Once approval to conduct the study was obtained, the primary researcher approached the teachers, who served as counselors, within each of the schools. These teachers were responsible for non-academic issues (i.e. social support) and able to provide practical suggestions and assistance prior to and during data gathering. In addition, the teachers facilitated the researcher's access to the students for the purpose of data gathering.

A total of 4, 261 adolescents were approached, in their respective classrooms, and told about the: study's purpose and procedure; issues of confidentiality and anonymity; and, their right to withdraw at any time without repercussions. Each was given a packet, to take home to their mother, which contained a letter (explaining the study, issues of confidentiality and anonymity, and the right to withdraw, at any time, without negative repercussions), along with a consent form to sign, and the Demographic Data Questionnaire for Mothers and the Center for Epidemiologic Studies Depression Scale (CES-D) to complete. The letter requested each mother to complete the enclosed instruments, sign the consent form, place all completed documents back into the packet envelope and return the packet, with the enclosed documents, to the primary investigator the next day, via their adolescent. A total of 1,758 completed packets were returned, for a 41.26% return rate.

Upon receipt of the mothers' signed consent forms and their completed CES-D, code numbers were placed on the CES-Ds. Each student then was administered, in a class room, the: Demographic Data Questionnaire for Adolescents; Center for Epidemiologic Studies Depression Scale (CES-D); Negative Event Scale (NES); Parental Bonding Instrument (PBI); Multidimensional Scale of Perceived Social Support (MSPSS); Maternal Supportive Behaviors Questionnaire (MSBQ) and Rosenberg Self-Esteem Scale (RSE).

Directions for completion of the questionnaires were provided, as well as responses to questions that arose during the administration process. Prior to administration of the questionnaires, the students were informed their respective mother had given written approval for them to participate. However, they were asked to sign an assent form if they desired to take part in the study, and reminded they had the right to withdraw, at any time, without negative repercussions. None withdrew from the study.

Code numbers were placed on each adolescent's completed questionnaires to facilitate matching with their respective mother's completed CES-D. Only questionnaires of those, whose mother obtained a CES-D score of 16 or greater, were placed into the analysis process. All code numbers were removed from the questionnaires immediately after completion of the CES-D screening process.

Four hundred ninety-four of the CES-D Scales indicated the responder had depressive symptoms (CES-D$\geq$16). However, 32 respondents did not live in the same household as their biological adolescent and two made errors answering the questionnaires. Thus, 34 questionnaires were excluded, leaving a total of 460 viable questionnaires.

Instruments: Eight instruments were used to collect data from each adolescent and mother. They included the: Demographic Data Questionnaire for Mothers; Demographic Data Questionnaire for Adolescents; Center for Epidemiologic Studies

Depression scale (CES-D); Negative Event Scale (NES); Parental Bonding Instrument (PBI); Multidimensional Scale of Perceived Social Support (MSPSS); Maternal Supportive Behaviors Questionnaire (MSBQ); and, Rosenberg's Self-esteem Scale(RSE).

With the exception of the Demographic Data Questionnaires and the MSBQ, both of which were constructed, in Thai, by the primary investigator, the instruments were translated from English into Thai, by prior researchers,[9, 21] and then back-translated into English. The back-translated English version was compared with the original English version of each instrument for the purpose of assuring no change in meaning occurred in the content. Each instrument was reviewed by five experts (two psychiatrists, two psychologists and a nursing instructor) and pilot-tested to determine the instruments' internal reliability, clarity and comprehensiveness.

The pilot-test was accomplished through use of 31 Thai adolescents and their respective mother with depressive symptoms, whose characteristics were similar to the study sample and independent of the intended study sample. The procedure used to conduct the pilot study was identical to the intended study. The pilot study internal reliabilities, for adolescents, were: CES-D (0.87) NES (0.94), PBI (0.89), MSBQ (0.86), MSPSS (0.79) and RSE (0.88). The reliability of the CES-D, for mothers, was 0.74.

The Center for Epidemiologic Studies Depression Scale (CES-D)[22] is a self-administered 20 item questionnaire designed to measure depressive symptoms by ascertaining the level of depressive symptoms a subject has experienced over the previous week, including the current day. The scale consists of four major depressive symptoms: 7 items for depressed affect (items 3, 6, 9, 10, 14, 17, 18); 4 items for positive affect (items 4, 8, 12, 16); 7 items for somatic and retarded activity (items 1, 2, 5, 7, 11, 13, 20); and, 2 items for interpersonal relationships (items 15, 19). The possible responses, for each of the 20 items, ranges from 0 = rarely or none of the time to 3 = most or all of the time. The score from each of the 20 items is summed to produce an overall total score, which can range from 0 to 60. Higher scores indicate greater depressive symptom severity. A score between 0 and 15 suggests that "no depression" is present, while scores at or above 16 are indicative of clinically significant symptomatology. There is a linear relationship between increasing score values and the likelihood of a diagnosis of major depressive disorder.[22] In population screening, the cut-off score of 16 has shown high sensitivity ranging from 86% to 100%, and determined to be the best cut-off score in detecting depressive symptoms among a variety of populations across cultures.[23] In addition, a longitudinal study found that adolescents, with an initial CES-D score of 16, developed moderate/severe depressive symptoms at follow-up. This finding confirmed a high sensitivity of the CES-D scale at the score of 16.[24] A cut-off score of 16 for the CES-D has been used among researchers in the area of depressive symptoms in adolescences of depressed mothers.[25] The CES-D also has been shown to be a valid instrument across racial and culturally diverse groups.[23] It takes approximately 10 to 15 minutes to complete. The alpha reliability coefficient of the instrument, for this study, was 0.87 for adolescents and 0.74 for mothers.

The Negative Event Scale (NES)[26] is a self-administered questionnaire that measures perceived life stressors commonly experienced by adolescents. The 42 item scale consists of 10 subscales addressing problems with: 1) friends; 2) boy/girl friend; 3) money; 4) courses; 5) teacher; 6) parents or parents-in-law; 7) other students; 8) relatives; 9) health; and, 10) academic limitations and course interest. The respondent is asked, "Last month, how much hassle did you experience?" for each of the 42 negative life events. Each event is

scored using a 6-point Likert-like scale: 0 = did not occur; 1 = event occurred but there was no hassle; 2 = event occurred along with a little hassle; 3 = event occurred along with somewhat of a hassle; 4 = event occurred along with a lot of hassle; and, 5 = event occurred along with extreme hassle. A total score is obtained by summing across all 42 items, which can produce a range of scores from 0 to 210. It takes approximately 10 minutes to complete the scale. The NES has demonstrated excellent construct validity and reliability with Thai adolescents (r = 0.98).[9] The reliability of the instrument, for this study, was 0.94.

The Parental Bonding Instrument (PBI)[27] is a 25-item self-rating scale designed to measure perceived relationships and experiences, with parents, based upon the child's memory of his/her parents during the first 16 years of life. For this study only maternal bonding was measured. The PBI is composed of 2 subscales: evaluating care (12 items) and evaluating overprotection (13 items). Each item, which assesses the parent in question, is rated by the respondent on a four-point Likert-type scale (0 = very unlike to 3 = very like). The total score for each of the two dimensions (care and overprotection) is created by summing items that address the respective dimension. The possible range of scores for the care dimension is 0 to 36, while the range of scores for the overprotection dimension is 0 to 39. High scores on the care dimension represent the adolescent's perception of caring and affectionate parenting, while high scores on the overprotection dimension represents the adolescents' perception of overprotective parenting.[27] Low scores on the care dimension and high scores on the overprotection dimension are considered to be suggestive of a risk for depressive symptoms.[28] The PBI shows excellent construct and convergent validity, as well as reliability with a range from .91 to .99.[1] In addition, it has demonstrated stability over a 20-year period.[28]

Charoensuk[9] translated the PBI from English into Thai, but added 5 items, in order to increase the instruments' reliability in a Thai adolescent population. Two items were added to caring (#26 and #27), while three items were added to the overprotection dimension (#28, #29 and #30). Thus, the Thai version of the PBI consists of 14 items for parental care and 16 items for parental overprotection. Like the original English version of the PBI, items are scored on the same four-point Likert-like scale (0 = very unlikely to 3 = very likely), and total scores for each dimension are obtained by summing the score for items in each respective dimension. Scores for the care dimension can range from 0 to 42, while scores for the overprotection dimension can range from 0 to 48. Interpretation of the scores is the same as the original English version of the PBI. Alpha coefficients found, by Charoensuk,[9] for the Thai version of the PBI were .88 for caring and .78 for overprotection.

In this study, prior to data analysis, the scoring method for the "caring component" was reverse, so that high numerical values of the caring dimension of the instrument conceptually fit with high numerical values of the overprotection dimension (a negative concept). As a result, high scores indicated low levels of caring and affectionate parenting, rather than high levels of caring and affectionate parenting. The scoring for the overprotection dimension of the scale remained the same and was not reversed. The scale can be completed in approximately 5 to 10 minutes. The alpha coefficient for the instrument, for this study, was 0.87.

The Maternal Supportive Behaviors Questionnaire (MSBQ) was a modification, by the primary researcher, of the Inventory Social Supportive Behaviors (ISSB)[29] instrument. The purpose of both the ISSB and the MSBQ is to measure the quantity of support adolescents received over the

past four weeks from a significant person, with whom they have had a personal relationship. For the MSBQ, the significant person is the mother. Permission to modify the MSBQ was obtained from Dr. Manual Berrera (personal communication, May 23, 2007), an author of the ISSB. Although the ISSB has been modified, translated into Thai and used on a Thai adolescent population,[22] based upon the evaluation, by the primary researcher's instrument evaluators, of the Thai version of the ISSB, it was determined best to modify the original ISSB and, thereby, create the MSBQ. The instrument evaluators indicated the contexts and conditions given in many items, of the Thai version of the ISSB, did not fit the Thai culture.

In the ISSB, received support is defined as assistance received in three forms: 1) being there (physically, emotionally and spiritually); 2) giving help; and, 3) giving information and advice.[29] Moreover, the framework of question asking was developed for use in adolescents who also were target subjects in this study. To create the MSBQ, via modification of the ISSB, seven items were deleted from the ISSB (i.e., items 1, 3, 13, 17, 22, 34, 38, and 40) and the content/conditions stated in the remaining items were changed to more accurately reflect the Thai culture. However, the conceptual framework for the ISSB's three support forms and their related questions were maintained in the MSBQ. Since the required responses for the ISSB questions were based upon the frequency of occurrence of support, which cannot be appropriately applied in the Thai culture, the MSBQ item responses were changed to an agree/disagree format.

The created, self-administered MSBQ, contains 33 items that were answered on a 4-point rating scale (1 = definitely disagree; 2 = somewhat disagree; 3 = somewhat agree; and, 4 = definitely agree). Higher scores indicate higher support received from mothers. It takes about 15- 20 minutes to complete the instrument. After content validation by the experts, the scale was considered acceptable for use with adolescents having a mother with depressive symptoms, with a scale-level CVI of 0.85. The alphas coefficient for the instrument, in this study, was .96.

The Multidimensional Scale of Perceived Social Support (MSPSS)[30] is a 12-item instrument designed to measure the perceived amount of social support one receives from three separate sources: family, friends and significant others. Each of the three sources of social support is assessed using four respective questions. Examples of two questions are: "There is a special person who is around when I am in need;" and, "My family really tries to help me." The instrument utilizes a 7-point Likert-like response format (1 = very strongly disagree to 7 = very strongly agree). A score for each of the three subscales is obtained by summing across the respective items. A total score is obtained by summing across all 12 items.[30] Scores for each subscale range from 4 to 28, with higher scores indicating a higher level of perceived social support received from the respective subscale (i.e., family, friends and significant other), whereas low scores suggest decreased levels of perceived social support. It takes approximately 3 minutes to complete. The MSPSS has been used extensively and has demonstrated sound psychometric properties.[31] It has been used in Thailand to measure perceived social support in adolescents, with a reliability of 0.89.[7] In this study, the reliability for the MSPSS was 0.89.

The Rosenberg Self-Esteem Scale (RSE)[32] is a 10-item, self-administered instrument developed for the purpose of measuring adolescent's global feelings of self-worth or self-acceptance. The scale consists of 2 dimensions: a feeling of self-worth and self-respect; and, a feeling of competence and ability. Feelings of self-worth and self-acceptance are measured using eight items, while competence and ability are assessed using two items. Examples

of one question from each of the two dimensions of the scale are: "I feel that I am a person of worth at least on an equal plane with others;" and, "I am able to do things as well as most other people." For each of the 10 items, a participant rates how much he/she has valued himself/herself in the last month on a scale of 1 = strongly disagree to 4 = strongly agree. The higher the score, the higher one's self-assessed self-esteem. It takes approximately 5 minutes to complete. Reliability of the scale has been found to range from .77 to .88.[32] The reliability of the RSE, for this study, was .78.

Results

Data analysis, using structural equation modeling (SEM), validated the causal model of adolescent depressive symptoms, while employing LISREL revealed a significant fit with chi-square = 251.462; df = 217; p-value = 0.054; RMSEA = .019, GFI = .964; AGFI = .927, as displayed in Figure 1. The correlation matrix of latent variables is shown in Table 1. The paths in the model consisted of factor loadings and effects between variables in the model (see Table 2 & 3). Every factor loading of indicators, measuring the seven latent variables, were significant at 0.01 (see Table 3).

Findings from structural equation modeling showed maternal depressive symptoms had a significant, positive, indirect effect on adolescent depressive symptoms (.095; $p < .01$), via perceived life stress, perceived maternal parenting, maternal support, support from others and self-esteem. Gender had a significant, positive, indirect effect on adolescent depressive symptoms (.086; $p < .05$), via perceived life stress, perceived maternal parenting, maternal support, support from others and self-esteem.

Perceived life stress had a significant, positive, total effect on adolescent depressive symptoms (.281; $p < .01$), which was both a significant, positive, direct effect (.161; $p < .01$) and an indirect effect (.120, $p < .01$), via maternal support, support from others and self-esteem. Perceived maternal parenting had a significant positive total effect on adolescent depressive symptoms (.471; $p < .01$), which was both a significant, positive, direct effect (.163, $p < .05$) and an indirect effect (.308, $p < .01$), via maternal support, support from others and self-esteem. Maternal support had a significant, negative, total effect on adolescent depressive symptoms (-.096; $p < .01$), which was decomposed into a negative, non-significant, direct effect and a significant, negative, indirect effect (-.032; $p < .01$), via self-esteem, indicating that maternal support had the mediating effect through self-esteem on adolescent depressive symptoms. Support from others had a significant, negative, total effect on adolescent depressive symptoms (-.187; $p < .01$), which was decomposed into a negative, non-significant, direct effect and a significant, negative, indirect effect (-.138, $p < .05$), via self-esteem, indicating that support from others had the mediating effect through self-esteem on adolescent depressive symptoms. Self-esteem not only had a significant, negative, direct effect on adolescent depressive symptoms (-.601; $p < .01$), but also had the greatest effect on adolescent depressive symptoms in the model. The LISREL model fit very well to the empirical data and explained 61.5% of variance of depressive symptoms in adolescents of mothers with depressive symptoms.

Table 1 Correlation matrix of the study variables (n=460)

	MoDe	Gen	PLS	Ppar	Msup	Osup	Selfest	AdoDe
MoDe	1.000							
Gen	0.006	1.000						
PLS	0.166**	0.109*	1.000					
Ppar	0.186**	0.089	0.317**	1.000				
Msup	-0.061	-0.067	-0.212**	-0.541**	1.000			
Osup	-0.068	0.042	-0.173**	-0.370**	0.548**	1.000		
Selfest	-0.090	-0.025	-0.298**	-0.321**	0.308**	0.360**	1.000	
AdoDe	0.194**	0.087	0.462**	0.410**	-0.341**	-0.397**	-0.506**	1.000

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

MoDe = Maternal Depressive Symptoms
Gen = Gender
PLS = Perceived Life Stress
PPar = Perceived Maternal Parenting
Msup = Maternal Support
Osup = Support from Others
Selfest = Self-esteem
AdoDe = Adolescent Depressive Symptoms

Table 2 validation results of the causal model of adolescent depressive symptoms

Observed variables	b	SE	t	SC	R^2
Maternal Depressive Symptoms (MDS)					
mds 1	0.320	0.017	18.808	0.787	0.619
mds 2	0.387	0.021	18.375	0.776	0.602
mds 3	0.406	0.021	18.931	0.789	0.623
mds 4	0.492	0.026	18.735	0.786	0.617
Gender					
female	0.361	0.020	18.378	0.778	0.606
Perceived Life Stress (LS)					
ls1	0.747	-	-	0.780	0.608
ls2	0.900	0.066	13.679	0.772	0.597
ls3	0.907	0.066	13.838	0.777	0.603
ls4	0.934	0.067	14.012	0.778	0.605
ls5	0.760	0.055	13.891	0.781	0.610
ls6	0.796	0.064	12.508	0.694	0.620
ls7	0.643	0.044	14.586	0.778	0.605
ls8	0.688	0.049	14.003	0.782	0.612
ls9	0.738	0.053	13.998	0.776	0.602
ls10	0.842	0.057	14.785	0.779	0.607

Table 2 (continued)

Observed variables	b	SE	t	SC	R^2
Perceived Maternal Parenting					
par-nc	0.358	-	-	0.750	0.562
par-o	0.348	0.026	13.358	0.780	0.609
Maternal Support (MS)					
ms1	0.287	0.045	6.361	0.798	0.636
ms2	0.254	0.040	6.297	0.776	0.603
ms3	0.252	0.040	6.300	0.784	0.614
Support from Others (OS)					
os1	1.019	-	-	0.784	0.615
os2	0.957	0.060	15.963	0.790	0.625
os3	0.920	0.060	15.280	0.779	0.606
Self-esteem (SE)					
se1	0.312	-	-	0.784	0.615
se2	0.414	0.023	18.405	0.795	0.623
Adolescent Depressive Symptoms (ADS)					
ads1	0.260	-	-	0.600	0.360
ads2	0.335	0.024	14.205	0.655	0.429
ads3	0.308	0.032	9.595	0.623	0.388
ads4	0.378	0.036	10.626	0.699	0.488

χ^2 =251.462, df = 217, p-value = .0542, RMSEA = .019, GFI = 0.964, AGFI = 0.927

Note: b = Estimated Parameter; SD = Standard Error; t = t-value;
R^2 = Construct Reliability; SC = Completely Standardized Value of Factor Loading

mds1 = somatic and retard activity
mds2 = depressed affect
mds3 = positive affect
mds4 = interpersonal relationship
Fem = female
ls = problems with friends
ls2 = problems with boy/girl friends
ls3 = problems with money
ls4 = problems with courses
ls5 = problems with teacher
ls6 = problems with parents
ls7 = problems with other students
ls8 = problems with relative/s
ls9 = health problems
ls10 = academic limitations & course interest
par-nc = perceived not caring
par-o = perceived overprotection
ms1 = emotional and physical support
ms2 = giving help
ms3 = giving information and guidance
os1 = significant others
os2 = family
os3 = friends
se1 = feeling of self value and self respect
se2 = feeling of competence and ability
ads1 = somatic and retard activity
ads2 = depressed affect
ads3 = positive affect
ads4 = interpersonal relationship

Table 3 Standardized direct effect, indirect effect, total effect of latent variables in the model (n = 460)

Causal Variables	Effected Variables					
	PLS			PPar		
	DE	IE	TE	DE	IE	TE
MoDe	0.116**	-	0.116**	0.132**	-	0.132**
	(0.029)		(0.029)	(-0.036)		(-0.036)
Gen	0.098*	-	0.098*	0.123*	-	0.123*
	(0.045)		(0.045)	(0.057)		(0.057)
Structural Equation Fit	R^2 =.021			R^2 =.030		
Causal Variables	Effected Variables					
	Msup			Osup		
	DE	IE	TE	DE	IE	TE
MoDe	-0.006	-0.107*	-0.113*	-	-0.074**	-0.074**
	(-)	(0.062)	(0.062)		(0.021)	(0.021)
Gen	-	-0.099*	-0.099*	-	-0.068*	-0.068*
		(-0.082)	(-0.082)		(0.031)	(0.031)
PLS	-0.013	-	-0.013	-0.025	-	-0.025
	(0.049)		(0.049)	(0.032)		(0.032)
PPar	-0.798**	-	-0.798**	-0.536**	-	-0.536**
	(0.311)		(0.311)	(0.071)		(0.071)
Structural Equation Fit	R^2 = .638			R^2 =.288		
Causal Variabales	Effected Variables					
	Selfest			AdoDe		
	DE	IE	TE	DE	IE	TE
MoDe	-	-0.074**	-0.074**	-	0.095**	0.095**
		(0.018)	(0.018)		(0.022)	(0.022)
Gen	-	-0.066*	-0.066*	-	0.086*	0.086*
		(0.025)	(0.025)		(0.031)	(0.031)
PLS	-0.190**	-0.006	-0.196**	0.161**	0.120**	0.281**
	(0.039)	(0.008)	(0.040)	(0.040)	(0.030)	(0.044)
PPar	-0.218**	-0.165**	-0.384**	0.163*	0.308**	0.471**
	(0.067)	(0.035)	(0.060)	(0.082)	(0.059)	(0.070)

Table 3 (continued)

Causal Variabales	Effected Variables					
	Selfest			AdoDe		
	DE	IE	TE	DE	IE	TE
Msup	0.053	-	0.053	-0.064	-0.032**	-0.096**
	(-)		(-)	(-)	(0.003)	(0.003)
Osup	0.229**	-	0.229**	-0.050	-0.138**	-0.187*
	(0.060)		(0.060)	(0.072)	(0.042)	(0.073)
Selfest	-	-	-	-0.601**	-	-0.601**
				(0.087)		(0.087)
Structural Equation Fit	R^2 = .228			R^2 = .615		

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

Note: The values in the table are Standardized Values. The values in the parenthesis are Standard Error.

DE=Direct Effect
IE=Indirect Effect
TE=Total Effect
MoDe = Maternal Depressive Symptoms
Gen = Gender
PLS = Perceived Life Stress
PPar= Perceived Maternal Parenting
Msup= Maternal Support
Osup= Support from Others
Selfest= Self-esteem

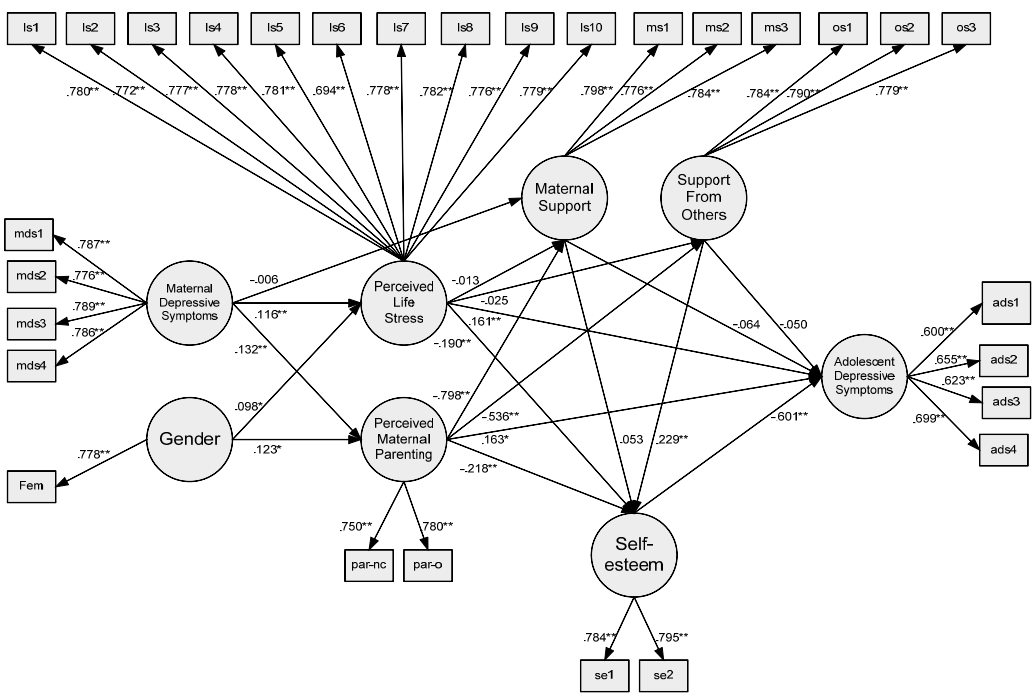

Figure 1 Validation results of the adolescent depressive symptoms model

Figure 1 (continued)

mds1 = somatic and retard activity
mds2 = depressed affect
mds3 = positive affect
mds4 = interpersonal relationship
Fem = female
ls1 = problems with friends
ls2 = problems with boy/girl friends
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ads1 = somatic and retard activity
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Discussion

The interpersonal theory of depression framework was used to predict relationships among the factors related to depressive symptoms in Thai adolescents of mothers with depressive symptoms. The findings identified the effect of maternal depressive symptoms on depressive symptoms in Thai adolescents. This relationship was mediated by intervening variables, including: perceived life stress; perceived maternal parenting; maternal support; support from others; and, self-esteem. The results are congruent with previous findings which have shown maternal depressive symptoms do not directly impact adolescents' depressive symptoms, but are influenced by mediating variables.[2]

The effect of maternal depressive symptoms on adolescents' depressive symptoms was shown to be mediated through: life stress (perceived life stress and perceived maternal parenting); social support (maternal support and support from others); and, self-esteem. In addition, social support (maternal support and support from others) was found to have a mediating effect on adolescents' depressive symptoms through self-esteem. These findings are congruent with prior research, which has revealed interpersonal relationships with significant others, in providing support and protecting self-esteem, are significant protective factors in the development of depressive symptoms.[15, 16] In addition, self-esteem has been shown to mediate the relationship of social support and depression, and social support has been found to be an important resistance factor, regarding depressive symptoms, but only in combination with self-esteem.[15,16] However, providing social support, without self-esteem enhancement, has not been found to be effective and might even place one at risk for diminished self-esteem.[16] Thus, the test model for Thai adolescents, in this study, supports previous findings which show cultural and racial differences are not strong enough to make a difference in the way self-esteem mediates depressive symptoms.[15]

The findings reveal depressive symptoms in their respective mother, not only led to increasing perceived life stress among adolescents, but also lead to increasing perceived impaired parenting behaviors (not caring and overprotective) from

them. In other words, Thai adolescents of depressed mothers were found to encounter stressful parenting, from their depressed mother, as well as experience stressful events in their own lives. These findings are congruent with prior studies, wherein life stress for adolescents of depressed mothers has been shown to consist of two domains: 1) stress from being parented by the depressed mothers; and, 2) stress from the stressful events in their own live.[11]

Moreover, this study found that gender had a mediating effect through perceived life stress and perceived maternal parenting on the adolescents' depressive symptoms, indicating the girls were more sensitive to this effect than the boys. Perceived life stress and perceived maternal parenting were found to be associated with depressive symptoms in the boys and the girls, but was slightly stronger in the girls than in the boys. This finding is congruent with recent research which has documented Thai culture plays an important role on parental rearing practices and a child's gender.[33] In addition, Thai parents are known to exercise more control over their daughters than their sons.[33] Differences in child rearing practices has been shown to have a significant impact on the perceived life stress and mental health of Thai children.[34] These findings also are congruent with prior findings which have revealed adolescent girls experience higher levels of interpersonal stress than do adolescent boys.[35] The higher levels of interpersonal stress, in turn, helps explain the higher rates of depressive symptoms in adolescent girls, in that exposure to episodic interpersonal stressors is an important factor regarding the development of depressive symptoms in adolescents.[35, 36]

The findings also suggest that perceived life stress has both a significant, positive, direct and indirect effect on adolescents' depressive symptoms. Those who had high levels of perceived life stress, directly and indirectly, also had an increase in their depressive symptoms. This finding is congruent with previous research, which has indicated that adolescents who are exposed to high levels of stress, particularly interpersonal stressors, are more likely to develop depressive symptoms than adolescents who are exposed to high levels of stress, but not in an interpersonal context.[35]

In addition, impaired parenting (not caring and over protection) from one's mother could, directly and indirectly, increase an adolescent's depressive symptoms. Adolescents, in this study, who received impaired parenting (not caring and over protection) from their respective mother, were less likely to receive support from their mother and others. The lack of perceived support may have decreased the adolescents' self-esteem and precipitated their depressive symptoms. However, impaired parenting from their respective mother also was found to directly decrease the adolescents' self-esteem and increase their depressive symptoms. The findings, of this study, are congruent with prior findings, which imply perceived lack of maternal care is associated with a diagnosis of depression among adolescents,[37] and support previous findings which suggest deficits in parental support can predict future increases in depressive symptoms, and the onset of major depression, among adolescents.[37]

These findings also suggest that the combination of having a depressed mother and a high level of life stress (perceived life stress and perceived maternal parenting) may lead an adolescent to perceive less social support, and, thus, a decreased self-esteem. In other words, adolescents of depressed mothers, who have high levels of life stress, may not perceive support from either their respective mother, or others, and be unable to develop their own self-esteem. On the other hand, if such adolescents perceive receive social support, their self-esteem may not be affected when experiencing stress. These findings are supported by the interpersonal theory of depression that purposes adolescents need support provided by their significant other, so that they can gain self-esteem. This theoretical foundation also is supported by prior

research which reveals the emotional support a Thai student receives from a significant other, specifically a parent, is the significant factor in the prediction of the development of the adolescent's self-esteem.[38] These findings also are congruent with previous findings which show peer and parental support has an effect on adolescents' self-esteem, but do so independently. In addition, peer support has been found to have more effect when maternal support is low, but minimal effect when maternal support is high.[39]

The applicability of the interpersonal theory of depression to Thai maternal-adolescent depressed populations (a theory in which self-esteem mediates the intimate relationship quality with a significant person having depressive symptoms) appears to be validated by the findings of this study. Having a poor, interpersonal, relationship with a mother could cause chronic anxiety and be conceptualized as a stressor.

This study also extends the understanding of social support in the context of adolescents of mothers with depressive symptoms. Prior research regarding social support has not distinguished maternal support from the support of others. In this study, besides others' social support, maternal support was explicitly identified. The results revealed that maternal support and support from others were key factors influencing adolescents' self-esteem. Thus, either support from one's respective mother, who has depressive symptoms, or from others, could attenuate the impact of maternal depressive symptoms on an adolescent's self-esteem.

Study Limitations and Recommendations for Future Research

All studies have limitation and this study is no exception. Firstly, the sample was limited to high school adolescents in Bangkok. Therefore, the findings are not generalizable to the entire Thai adolescent population, or to adolescents whose respective mother does not have depressive symptoms. Secondly, the sample consisted entirely of adolescence. It is possible that the relationship between maternal depressive symptoms and the course of depressive symptoms, in adolescents, might differ between individuals with pre-pubertal versus post-pubertal depressive symptoms onset.[40]

Based on the causal model, developed in this study, a potential future direction for research could be to test the causal model in other samples, i.e. Thai vocational and college students. Given the susceptibility of girls to impaired mothering, a study regarding the development, implementation and evaluation of mental health programs focusing on adolescent females might be in order.

Implications for Nursing Practice

The results reveal that having a mother with depressive symptoms is a sign of risk for depressive symptoms in an adolescent. Nurses, both in hospital and community settings, need to detect early depressive symptoms in adolescents, and provide appropriate preventive interventions. Mothers diagnosed with depression should be immediately assessed for their ability to take care of their children, and their interpersonal relationships with family members, which might create stress. Children of depressed women need regular monitoring for risk of developing problematic behaviors and depressive symptoms. They need to be provided with age appropriate information regarding stress management options. In the community, specifically in the schools, effective screening for at-risk adolescents is needed.

Psychiatric-mental health nurses need to assist teachers in developing the ability to assess and identify adolescents of mothers with depressive symptoms, and those at risk for impaired educational, social, and emotional functioning. School-based interventions, designed to improve maternal parenting and enhance social support, as well as protect self-

esteem in adolescents of mothers with depressive symptoms, need to be initiated. Such interventions would strengthen the family-school relationship, whereby schools could become more involved in the well-being of their students, and parents could gain social support and greater involvement within the multiple contexts and needs of their children.

Currently all high schools, in Bangkok, are run by the Ministry of Education and have instituted the 'student caring system'. Teachers are in the best place to identify and screen students who may be at risk. However, questionnaires, currently being used, are not designed to screen for depressive symptoms, or to screen adolescents for the signs of risk for depressive symptoms. Thus, effective screening instruments and interventions for adolescents with symptomatic parents are needed in Thailand.

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Interpersonal Theory of Depression

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