

Comments from the Editor

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Abstract

Knowledge of the effects of the specific approach, mode of delivery, and dose of educational interventions is essential to develop and implement effective post-operative educational interventions. Understanding the relationships of patient characteristics to outcomes is important for educational interventions. **Purpose and methodology:** The purpose of this systematic review was to examine who would most benefit from post-operative education, given in what type of approach and mode, and at what dose? The sample included 58 studies involving 5271 participants. **Major results:** Findings indicate delivery of post-operative patient education through the individualization of content, use of combined media for delivery, provision of education on a one-on-one basis, and in multiple sessions is associated with improvement in educational/health outcomes. Samples that contained individuals younger than 50 years of age and higher percentages of males showed benefits in outcomes of moderate magnitude. **Application:** The results highlight the importance of attending to the characteristics of both the elements of post-operative educational interventions and the individual patients in the design and delivery of patient education.

Introduction

Post-operative patient education is an essential component of nursing care aimed at assisting patients to take care of themselves, following discharge from hospital (Allen, Knight, Falk, & Strang, 1992; Cupples, 1991; Devine & Cook, 1983). Education provides patients with the information required to understand their condition, surgery, and recovery; to prevent and manage post-surgical symptoms; and to decrease/reduce hospital readmission and morbidity and mortality rates (Moore & Dolansky, 2001; Barnason, Zimmerman, Nieveen, Schmaderer, Carranza, & Reilly, 2003; Marshall, Penckofer, & Llewellyn, 1986; Moore, 1996). Results of individual and meta-analytic studies support the effectiveness of post-operative patient education in reducing costs as reflected in decreased post-operative hospital stays (Devine and Cook, 1986; 1983), and improving knowledge of self-care (Andrades, 2002; Beckie, 1989; Johnston, 2001; Lee & Bokovoy, 2005), self-care behaviours (Bolman et al., 2002; Celestino et al., 1998; Mahler et al., 1999; Marshall et al., 1986; Raleigh & Odtohan, 1987), and symptom experience (Reynolds, 2002; Watkins, 2001). While these findings demonstrate the effects of post-operative education on the intended outcomes, they fall short of elucidating the specific approach, mode of delivery, and dose of educational interventions associated with the desired outcomes. Knowledge of the most effective approach to, mode of delivery and dose required for an educational intervention to guide practice. Such knowledge will direct the design and implementation of education in day-to-day practice in the most effective and efficient way. Understanding the profile of patients who most benefit from post-operative education will guide efforts at developing targeted educational

interventions that are relevant and consistent with the needs of various subgroups of patients.

Purpose of the Study

This systematic review was conducted to address clinically relevant questions: Who would most benefit from post-operative education, given in what approach and mode, and at what dose? (Sidani & Braden, 1998). The specific objectives were: 1) to describe the approach to education, mode of delivery, and dose used in providing post-operative education; 2) to explore the extent to which variability in outcome achievement is associated with differences in the elements of educational interventions; and 3) to investigate differences in outcomes in relation to patient characteristics. The target population included adult patients undergoing surgery.

Conceptual Definitions

In this section, the variables of interest to the systematic review are defined at the conceptual level. These definitions guided the specification of criteria for selecting the studies and facilitated data extraction. They were derived from theories and models relevant to patient education and self-care. The variables are categorized into elements of post-operative educational interventions, outcomes of education, and patient characteristics.

Elements of post-operative educational interventions

Post-operative patient education refers to the communication of information (Rankin, 2001) about the course of recovery following surgery. The goals of post-operative patient education are to ensure that the individual has the appropriate knowledge required to perform self-care behaviours in the home environment, post-

discharge; to reduce the occurrence of symptoms and complications post-discharge; and to enhance recovery and overall quality of life (Dunstan & Riddle, 1997). In general, post-operative education covers topics related to: medication management, activity performance, nutrition, signs and symptoms of complications, incision care, pain management, and follow-up procedures (Hartford, Wong, & Zakaria, 2002; Beckie, 1989; Barnason et al.; Devine, 1991; Breemhaar, van den Borne, & Mullen, 1994; Talamini, Coleman, Sauter, Stanfield, & Fleisher, 1999; Hussey & Leeper, 1998).

The elements of post-operative educational interventions include the approach to education, mode of delivery, and dose. Conceptually, approach to education involves the general strategy for communicating the information to patients. Education can be given in two approaches: standardized and tailored or individualized (Redman, 2001).

Standardized post-operative education encompasses the provision of information pertaining to a pre-selected set of topics determined by nurses to be of relevance to post-operative self-management. The nurse discusses all topics with the patient. Individualized post-operative education consists of providing information on topics selected by the patient. The nurse discusses the topics that the patient deems relevant to their specific health situation (Redman). Mode of delivery encompasses the medium and format for giving post-operative education. Medium is the process through which education is delivered, and includes: 1) contact with the nurse through face-to-face or phone interaction; 2) written resources available to patients such as brochures or pamphlets, or on-line resources; and 3) audio-visual materials in the form of an audiotape or videotape (Redman). Format refers to how the education is offered, that is, one-on-one or group discussion (Redman). Dose is defined as the level at which an intervention is given

(Sidani & Braden, 1998). It is operationalized in terms of the number of sessions during which education is provided.

Outcomes of education

Three outcomes of education are of interest in this systematic review: self-care knowledge, self-care behaviour, and symptom experience. These outcomes represent the anticipated consequences of education delineated in models of patient education (Rankin, 2001) and self-care (Orem, 2001), and investigated in several studies (Andrades, 2002; Johnston, 2001; Lee & Bokovoy, 2005; Reynolds, 2002; Watkins, 2001; Bolman et al., 2002; Celestino et al., 1998; Mahler et al., 1999; Marshall et al., 1986; Raleigh & Odtohan, 1987; Blank & Smithline, 2002; Brown, 2006).

Self-care knowledge is defined as a body of facts and principles that is learned through life experience, or is taught. Knowledge is enhanced through educational interventions, and is made visible immediately through cognitive indicators such as recall of learned information (Rankin, 2001). Post-operative patient education focuses on self-care knowledge, which refers to information about the condition, the surgery, and the strategies for managing the condition to prevent complications. Self-care knowledge is operationalized as the correct identification of self-care information pertaining to fluid and food intake, activity performance, wound care, management of drug therapies, and recognition and response to signs and symptoms indicative of post-operative complications.

Self-care behaviours refer to the performance of self-care strategies to promote recovery following discharge from the hospital (Pomeranz & Shaw, 2007). Post-operative self-care strategies include: management of fluid intake, nutrition, and symptoms;

engagement in personal hygiene and usual physical activity; wound care; taking medications as prescribed; and monitoring for the development of and managing post-operative complications.

Symptoms are subjective experiences reflecting changes in a person's biopsychosocial function, sensation, or cognition (Garding, Kerr, Bay, 1988). Symptoms that are commonly experienced following surgery include pain, constipation, fatigue, nausea, vomiting, sleep disturbances, wound infection, and mood alterations (Reynolds, 2002; Watkins, 2001). Post-operative symptom experience, therefore, is operationalized as the occurrence and perceived severity of any of these subjective experiences.

Patient characteristics

Orem's Theory of Self-Care proposes that personal characteristics influence the acquisition of self-care knowledge, performance of self-care behaviours, and symptom experience (Orem, 2001). Results of a limited number of studies provide empirical support to this proposition. Three personal characteristics were found to correlate with outcomes of patient education: age, and gender.

Age reflects the person's state of development (Orem, 2001), whereby older persons have higher levels of development and are more likely to have experience; they tend to rely on their experience to guide self-care behaviours (Renpenning, 2005). In contrast, Brown (1992) conducted a meta-analysis and found an inverse relationship between age and knowledge gain following psychoeducational interventions for patients with diabetes.

Gender is an individual's self-representation that is influenced by biological (i.e. hormone levels) and social (i.e. roles) constructs (Eastwood & Doering, 2005). Gender

differences in self-care knowledge, self-care behaviour, and symptom experience are well-recognized. Women tend to engage in self-care more so than men, and to report higher levels of symptom severity, particularly pain, mood alterations, and sleep disturbance (Jickling & Graydon, 1997).

Education is operationalized as the person's formal schooling leading to a granting of a degree. Individuals with higher levels of education acquire the cognitive skills to facilitate the processing and recall of information discussed during educational information (Renpenning, 2005; Orem, 2001).

Design

This study is a systematic review of research that evaluated the effectiveness of post-operative patient education. This systematic review was conducted to address the three objectives. The definitions of the variables of interest guided the specification of key terms used to search databases, the specification of criteria for selecting studies, and the extraction of pertinent data. Effect sizes were computed for each category of outcomes if pertinent data were reported, and compared across elements of post-operative educational interventions and patient characteristics. Effect sizes quantify the effects of educational interventions on self-care knowledge, self-care behaviour, and symptom experience.

Sample

Studies were included in the systematic review if they met the following selection criteria: 1) the sample represented adult (≥ 18 years) patients who underwent surgery. No particular type of surgery was selected because the elements of educational interventions are comparable across patient conditions and the same outcomes are anticipated. Further,

including diverse patient populations allowed representation of various characteristics of interest. Other selection criteria included: 2) the educational intervention involved the provision of self-care information following surgery prior to discharge from hospital; 3) the outcomes assessed were related to self-care knowledge, self-care behaviour, and symptom experience; and 4) the study report was published in English between 1986 and 2007. Studies that used experimental or randomized clinical trial (RCT) and quasi-experimental designs involving two groups (experimental and comparison) were included in the systematic review. Results of meta-analyses showed that the effect sizes of experimental and quasi-experimental studies are comparable (Burns & Grove, 2005).

Search strategies

The search for relevant studies used the following databases: CINAHL, MEDLINE, PUBMED, EMBASE, COCHRANE, and HEALTH STAR. The keywords used in the search were: discharge plan, post-operative, surgical education, teaching, post-surgical, post-operative education, post-operative teaching, post-surgical education, post-surgical teaching, discharge education, discharge teaching, recovery teaching, and recovery education. A total of 924 articles were found to have addressed post-operative patient education. Of these, 866 articles were excluded because the reported study assessed the effectiveness of a combined pre and post operative educational intervention. A total of 58 studies met the selection criteria and were included in the systematic review (Articles included in systematic review are indicated in Reference list with an asterisk).

Methods

Data extraction

Data were extracted on study characteristics, elements of educational intervention, outcomes of education, and patient characteristics. The definitions presented earlier guided the development of a coding scheme to facilitate data extraction from each article.

Study characteristics.

The following information was gathered for each study: year of publication, country in which the study was done, study design (quasi-experimental or experimental), sample size (total, and for each study group), number and type of study groups (control or comparison and treatment, or two treatment groups), and patient population included. These data were used for descriptive purposes.

Elements of educational intervention.

Approach to education: was categorized as standardized or individualized.

Information on approach to education was obtained from the article's sections describing the nature of the intervention and/or the procedure for delivering it. Interventions that consisted of handing patients written resources, having patients watch a videotape or listen to an audiotape, and discussing with patients a pre-selected set of topics, were categorized as standardized education. Interventions that addressed individual patients' learning needs, either through discussion with nurse or computer-assisted instructions, were considered as individualized education.

Medium: for giving post-operative education was coded into face-to-face contact with nurse (nurse and patient in same room during educational interaction), phone contact with nurse, distribution of written resources (such as brochure, pamphlet, booklet) for patients to review on their own, and combination of different media for giving education (such as phone contact with nurse and distribution of written resources).

Format: for delivering education was coded as a) individual, involving one person at a time, which could take place when interacting with the nurse, or when patient reviews written and audio-visual materials, and b) group, involving several persons interacting with the nurse or watching a videotape.

Dose: was indicated by the total number of sessions for giving education and categorized into: one session versus two or more sessions. This categorization was necessary to have a balanced number of studies when examining the effect/relationship of dose with the outcomes.

Outcomes of education.

The specific outcomes of interest, that is, self-care knowledge, self-care behaviour, and symptom experience were assessed with self-report measures capturing 1) the percentage of correct responses to items inquiring about patients' understanding of the condition, surgery, and post-operative care, 2) performance of self-care strategies in which patients are expected to engage post-operatively, and 3) perceived symptom experience respectively. For each of these outcomes, data were extracted on whether or not post-test comparisons showed statistically significant differences between the study groups. These data were coded into 0 = no significant differences and 1 = significant differences favoring the experimental group that received the educational intervention. In addition, the mean and standard deviation reported for each study group at the first post-test were extracted. These data were used to compute the post-test effect size for each outcome investigated in individual studies.

Patient characteristics.

The data extracted and the subsequent coding of the data pertaining to the three patient characteristics are described below.

Age: The reported average age (mean or median) of the sample was recorded. The studies were then categorized into those reporting an average age ≤ 50 years (coded as 0) and those reporting an average age > 50 years (coded as 1).

Gender: The gender distribution in the sample was noted. Studies in which ≤ 50 % of the sample was comprised of women were assigned a code of 0 and studies consisting of > 50 % women were assigned a code of 1.

Education: The distribution of participants relative to the highest academic achievement was documented. Studies were then divided into two categories. Those reporting that most (≥ 50 %) participants had \leq high school education and those indicating that most (≥ 50 %) participants had at least some college. The categorization scheme was done to have a balanced number of studies when examining the relationship of these patient characteristics with the outcomes.

Data Analysis

Descriptive statistics were used to delineate the characteristics of the studies included in this systematic review; to describe the characteristics of patients comprising the sample selected across studies; and indicate elements of educational intervention frequently implemented across studies (objective 1). For the outcomes of interest, the effect size was computed by subtracting the mean of the control or comparison group from the mean of the experimental group and dividing the difference by the standard deviation of the comparison group (Burns & Grove, 2005). Due to the small number of studies that provided the data required to compute the effect size, it was not appropriate

to use inferential statistics to explore differences in outcomes in relation to elements of educational interventions (objective 2), and patient characteristics (objective 3).

Therefore, results pertaining to objective 2 and 3 are presented in terms of the number of studies showing statistically significant between-group differences and of the mean effect size on the respective outcomes.

Findings

Study characteristics

The 58 studies that met the inclusion criteria included 5271 participants. The studies were conducted in the United States (83.4%), Canada (5.9 %), United Kingdom (5.9 %), Asia (2.4 %), and Australia (2.4 %). Half (50 %) of the studies used an experimental design to evaluate the effectiveness of post-operative educational interventions, while 17.6% of the studies used a quasi-experimental design. The most frequently reported surgeries included: heart (41.2 %), general surgery (26.1%), abdominal/colorectal (14.7 %), appendicitis (12.5 %), and hip and/or knee replacement (5.5 %).

Elements of educational interventions

Standardized post-operative education was used in 43 of the studies (74.1 %), individualized post-operative education was used in 13 (22.1%), and combined methods were used in 2 studies (3.4 %). A combined delivery mode included face-to-face contact with a nurse, phone contact, and the distribution of written resources was used in 27 (46.5 %) studies. Delivery of educational interventions through only face-to-face contact with a nurse was reported in 23 (39.6 %) studies, while 8 studies (13.8 %) used written resources only. In twenty (34.5 %) studies, educational interventions were delivered on

an individual basis; in 2 (3.4 %) they were delivered in group format, while 36 (62.1 %) studies did not provide information detailing how the interventions were implemented. Twenty-six (44.8 %) studies contained interventions that were provided in more than one session.

Characteristics of the participants

In 60.4 % of the studies, the sample consisted of patients ≤ 50 years of age and in 39.6 % of the studies, patients > 50 years of age comprised the sample. For 37.9 % of the studies, the sample comprised mainly men. In the majority of studies (86.2 %) most participants had less than or equal to high school education.

Outcome achievement relative to intervention elements

Table 1 presents the number of studies that provided data to compute post-test effect size and the mean (range) effect size for each outcome. The results are summarized for each educational intervention element.

Approach to education.

Of the 12 studies that evaluated the effects of post-operative education on self-care knowledge, 5 (40 %) investigated individualized education and 7 (60 %) investigated the standardized approach to education. Statistically significant differences between the comparison and experimental group in post-test self-care knowledge were reported in 80 % of the studies involving individualized and 42.8 % involving standardized approach to education. In the studies included in this review, the experimental group reported higher knowledge gain at post-test than the comparison group. On average, the effect size for self-care knowledge was larger for individualized than standardized approach to education. Fourteen studies were concerned with self-care

behaviour as an outcome of post-operative education. Of these 6 (40 %) implemented individualized and 8 (60 %) used the standardized approach to education. In half (50 %) of studies using an individualized and 87.5 % using a standardized approach, a significant difference was found between the study groups favoring the experimental group. The mean effect size was larger for individualized as compared to standardized education.

Of the 10 studies that examined the outcomes of symptom experience, 2 (20 %) investigated individualized and 8 (80 %) standardized approach to education. Statistically significant differences favoring the experimental group in post-test symptom experience were reported in 50 % of the studies involving individualized and 100 % of the studies involving standardized approach to education. The mean effect size was larger for individualized than standardized education.

Mode of delivery: Medium.

Of the 12 studies that focused on self-care knowledge, 10 (83.3 %) investigated interventions delivered using combined media and 2 (16.6 %) evaluated interventions delivered via face-to-face contact with a nurse. Statistically significant differences (i.e. higher score in experimental group) between the comparison and experimental group in post-test self-care knowledge were reported in 70 % of the studies involving combined media and 50 % involving face-to-face contact with a nurse. The mean effect size was larger for educational materials delivered through combined media than face-to-face contact.

There were 14 studies concerned with self-care behaviour as an outcome of post-operative education. Ten (71.4 %) studies contained interventions delivered through combined media and 4 (28.5 %) evaluated interventions delivered via face-to-face contact

with a nurse. Statistically significant between group differences in self-care behaviours were reported in 70 % of the studies involving combined media and 50 % face-to-face contact. The mean effect size was larger for the delivery of education through combined media than face-to-face contact.

Ten studies focused on symptom experience, 7 (70 %) examined interventions delivered through combined media and 3 (30 %) evaluated interventions delivered via face-to-face contact with a nurse. Statistically significant between group differences in symptom experience were reported in 14.2 % of the studies involving the use of combined media and 66.7 % involving face-to-face contact. The mean effect size was larger for the delivery of educational materials using combined media than face-to-face contact.

Mode of delivery: Format.

The 11 studies that evaluated the effects of post-operative education on self-care knowledge were delivered on a one-to-one basis. Seven (63.6 %) studies reported statistically significant differences, favoring the experimental group, with a moderate effect size. Thirteen studies concerned with self-care behaviour as an outcome of post-operative education evaluated interventions given on a one-to-one basis. Of these, only 1 (7 %) reported statistically significant between group difference with a small effect size. In the 11 studies that evaluated the effects of post-operative education on symptom experience the interventions were delivered on a one-to-one basis. Three (27.2 %) studies reported statistically significant differences with a moderate effect size.

Dose.

Of the 10 studies concerned with the outcome of self-care knowledge, 8 (80 %) evaluated high (> 1 session) dose educational interventions, while 2 (20 %) investigated a single session interventions. Statistically significant between group differences in self-care knowledge were reported in 62.5 % of the studies reporting high dose and 50 % of the studies involving single session education. The mean effect size was larger for high dose than single session education. Thirteen studies investigated self-care behaviour as an outcome of post-operative education; 11 (84.6 %) included high dose while 2 (15.4 %) single session interventions. Statistically significant between group differences in self-care behaviours were reported in 18.2 % of the studies with high dose and 50 % of the studies with single session educational interventions. The mean effect size was larger for high dose than one-session interventions. Of the 10 studies that evaluated symptom experience, 7 (70 %) contained high dose while 3 (30 %) single session interventions. Statistically significant differences between the comparison and experimental group in symptom experience were reported in 14.2 % of the studies involving high dose interventions with a moderate effect size.

Outcome achievement relative to patient characteristics

The results of this meta-analysis indicated that psychoeducational interventions had smaller effects for patients 40 years of age or older than for younger patients. Table 2 presents the number of studies that provided the mean (range) effect size for each outcome in relation to the patient characteristics of interest. The results are described for each patient characteristic.

Age.

About 77 % of the 9 studies that assessed self-care knowledge as an outcome of post-operative education sampled patients > 50 years old and 23 % of the studies comprised patients < 50 years. The mean effect size was slightly lower in studies with samples of patients > 50 than patients < 50. Most (75 %) of the 12 studies assessing self-care behaviour sampled patients > 50 years old and 25 % comprised patients < 50 years. The mean effect size was lower in samples of patients > 50 than patients < 50. Of the 9 studies assessing symptom experience, 7 (77.8 %) sampled patients > 50 years old, while 2 (22.2 %) contained patients < 50 years. The mean effect size was lower in samples of patients > 50 than patients < 50.

Gender.

In 70 % of the 10 studies examining self-care knowledge, the sample consisted primarily (i.e. > 50 %) of men and in 30 % of the studies the sample included primarily (i.e. > 50 %) women. The mean effect size for self-care knowledge was larger in samples with more women than men. Most (69 %) of the 13 studies evaluated self-care behaviour contained more men and 30.7 % contained more women. The mean effect size was slightly smaller in studies involving more women than men. Eleven studies investigating symptom experience, 6 (54.5 %) contained more men and 5 (45.4) % more women. Moderate effect sizes was found for studies that sampled more men than women.

Education.

Just over 90 % of the 12 studies that assessed self-care knowledge as an outcome of post-operative education included participants with low formal education (i.e. less than or equal to high school), while 8.3 % of the studies had samples with high formal education (i.e. greater than high school). In 28.6 % of the 14 studies assessing self-care

behaviour samples included participants with low education. Eleven studies evaluating symptom experience, 8 (72.7 %) contained samples with low education, while 27.2 % of the studies had samples with high education. For all outcomes, a moderate effect size was found for studies that included more participants with high than low level of formal education.

Discussion and Application

The results of this systematic review showed larger effect sizes for post-operative patient education in which the content was individualized, and given in a combination of media on an individual basis, and in more than one session. This design of educational intervention was beneficial in that it produced moderate improvement in self-care knowledge and performance of self-care behaviour, and decline in the number of post-operative symptoms experienced. These findings are consistent with those of studies conducted by Guruge (1999) and Suls and Wan (1992) who examined pre-operative patient education. Thus, the results reinforce theoretical assumptions (Redman, 2001) for the individualization of educational content, use of multiple means for delivering education, provision of education on an individual basis, and in multiple sessions.

Studies in which the sample participants were < 50 years old, contained 50 % more men, and whose sample participants had low formal education demonstrated moderate effect sizes for self-care knowledge, self-care behaviour, and symptom experiences. These findings are consistent with those of studies conducted by Guruge (1999) and Lauver et al., (2002) in that they report individualized/tailored interventions are most effective than standardized educational programs. Standardized patient education encompasses the nurse being responsible for the selection and identification of

areas that he or she perceives is important for the patient to learn, while individualized patient education involves patients selecting the topics that they deem to be relevant to their specific health situation (Redman, 2001). Hence, patients' perceived learning needs are assessed prior to the delivery of patient education materials.

Furthermore, the use of multiple media is consistent with Suls and Wan's (1992) who found that education provided in both written and audiovisual format was most effective in producing changes in patient's knowledge and behaviour performance. Examples of multiple media include: contact with a health care provider through face-to-face or phone; written materials such as brochures and pamphlets; and audiovisual (e.g. watch a videotape or listen to audiotape) (Redman, 2001).

The findings suggest that nurses should reconsider the redesign their education initiatives to include both individualized educational interventions and use of multiple media. That is the educational content should be individualized to reflect the learning needs of the individual at a particular point in time. The first step in the process of individualization involves the evaluation of learning needs and delivery of education should be provided in multiple doses over a period of time to enhance the patient's overall knowledge, performance of specific behaviours, and reduce symptoms experienced during the post-operative recovery period. Furthermore, nurses should be presenting their educational content using multiple modalities to enhance patients' knowledge and performance of behaviours post-operatively, as well to reduce symptoms experienced during the recovery period. Use of multiple modalities enhances the likelihood for retention, recall, and application (Redman, 2001). Education should be

presented in written format in combination with audio and/or video accompaniment to further enhance knowledge, behaviour performance, and health related outcomes.

Conclusions based on demographic characteristics of > 50% were reported in this manner because of the inconsistency of results identified throughout the literature during the review. The majority of studies reported demographics based on these large categorical classifications. Thus it was difficult for us to report otherwise. Additional research to further examine the influence of these characteristics is needed.

Future research should continue to explore the association between patient characteristics and post-operative patient education interventions. The results are based on a synthesis of studies to support moderate health related outcomes pertaining to specific individuals' characteristics [e.g. age category (< 50 years vs. \geq 50 years), gender (men vs. women), and level of education (low education vs. high education)]. Further exploration into patient demographics is needed to gain a better understanding of its relationship to post-operative patient education outcomes.

Table 1: Effect size for outcomes observed for each intervention element

Intervention element	Outcome (n=total number of eligible studies)	Category of intervention element (n=number of studies with significant findings/total eligible studies)	
Approach to education	Self-care knowledge (n = 12)	Individualized n = 4 / 5 ES = 0.39 (0.25 – 0.5)	Standardized n = 3 / 7 ES = 0.36 (0.21-0.5)
	Self-care behaviour (n = 14)	n = 3 / 6 ES = 0.24 (0.2 – 0.26)	n = 7 / 8 ES = 0.18 (0.15 – 0.2)
	Symptom experience (n = 10)	n = 1 / 2 ES = 0.35	n = 8 / 8 ES = 0.35 (0.3 – 0.4)
Mode of Delivery - Medium	Self-care knowledge (n = 12)	Combined media n = 7 / 10 ES = 0.48 (0.35 – 0.56)	Face-to-face n = 1 / 2 ES = 0.32
	Self-care behaviour (n = 14)	n = 7 / 10 ES = 0.35 (0.28 – 0.39)	n = 2 / 4 ES = 0.25 (0.21 – 0.29)
	Symptom experience (n = 10)	n = 1 / 7 ES = 0.35	n = 2 / 3 ES = 0.15 (0.1-0.2)
Mode of Delivery – Format	Self-care knowledge (n = 11)	One-to-one n = 7 / 11 ES = 0.43 (0.25 – 0.5)	Group n = 0 ES = N/A

	Self-care behaviour (n = 13)	n = 1 / 13 ES = 0.23	n = 0 ES = N/A
	Symptom experience (n = 11)	n = 3 / 11 ES = 0.35 (0.3 – 0.39)	n = 0 ES = N/A
Dose	Self-care knowledge (n = 10)	One session n = 1 / 2 ES = 0.13	More than one session n = 5 / 8 ES = 0.45 (0.3 – 0.49)
	Self-care behaviour (n = 13)	n = 1 / 2 ES = 0.14	n = 2 / 11 ES = 0.23 (0.1 – 0.36)
	Symptom experience (n = 10)	n = 0 ES = N/A	n = 1 / 7 ES = 0.45

Table 2: Effect size for outcomes observed for each patient characteristics

Patient characteristic	Outcome (n=total number of eligible studies)	Category of intervention element (n=number of studies with significant findings/total eligible studies)	
Age	Self-care knowledge (n = 9)	Less than 50 n = 1 / 2 ES = 0.46	Older than 50 n = 4 / 7 ES = 0.31 (0.21 – 0.4)
	Self-care behaviour (n = 12)	n = 3 / 3 ES = 0.30 (0.28 – 0.32)	n = 4 / 9 ES = 0.12 (0.03 – 0.1)
	Symptom experience (n = 9)	n = 2 / 2 ES = 0.49 (0.2 – 0.58)	n = 2 / 7 ES = 0.30 (0.1 – 0.5)
Gender	Self-care knowledge (n = 10)	Studies that contained more than 50 % women n = 1 / 3 ES = 0.60	Studies that contained more than 50 % men n = 5 / 7 ES = 0.5 (0.3 - 0.6)
	Self-care behaviour (n = 13)	n = 1 / 4 ES = 0.10	n = 6 / 9 ES = 0.14 (0.1 – 0.3)
	Symptom experience (n = 11)	n = 0 / 5 ES = N/A	n = 2 / 6 ES = 0.40 (0.2 – 0.6)
Education	Self-care knowledge (n = 12)	Less than or equal to high school n = 7 / 11 ES = 0.43 (0.1 – 0.5)	Greater than high school n = 0 / 1 ES = N/A
	Self-care behaviour (n = 14)	n = 3 / 4 ES = 0.31 (0.2 – 0.37)	n = 0 / 10 ES = N/A
	Symptom experience (n = 11)	n = 2 / 8 ES = 0.40	n = 0 / 3 ES = N/A

Notes

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Please check that all references are included and are in APA 6th edition format

References marked with an asterisk (*) indicate studies included in the systematic review

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