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Usefulness of nursing theory-guided practice: an integrative review

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Background: Nursing theory-guided practice helps improve the quality of nursing care because it allows nurses to articulate what they do for patients and why they do it. However, the usefulness of nursing theory-guided practice has been questioned and more emphasis has been placed on evidence-based nursing and traditional practice. Therefore, an examination of experimental studies was undertaken to analyse the extent of use and usefulness of nursing theories in guiding practice. We reviewed experimental studies because in this era of evidence-based practice, these designs are given more weightage over other research designs. This examination would corroborate the usefulness of nursing theory-guided practice compared to traditional practice.
Methods: An integrative review was conducted. Literature search was performed within multiple databases, and 35 studies were reviewed and appraised.
Results: Majority of the studies were from Iran, the United States and Turkey and used Orem's self-care model, Roy's adaptation model and Peplau's theory of interpersonal relations. The effect of theory-guided interventions was evaluated in improving quality of life, self-efficacy, self-care and stress of patients with chronic, acute, cardiac and psychological illnesses. The quality rating was judged to be strong for three studies, moderate for 25 studies and weak for seven studies. All of the strongly rated studies found nursing theory-guided interventions useful. Overall, nursing theory-guided interventions improved all of studied outcomes in 26 studies and at least one outcome in nine studies. None of the studies reported that nursing theory-guided interventions as not useful.
Conclusion: Nursing theories have guided practice in both eastern and Western countries, and theory-guided practice has been found useful compared to traditional nursing practice. Therefore, nurses should continue to guide their nursing practice through the lens of nursing theories and should continue to evaluate the effectiveness of nursing theory-guided practice.

Keywords: experimental studies, nursing theory-guided practice, nursing theories.

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Introduction

Nursing is a theory- and practice-based profession. Nursing theories guide practice by helping nurses clarify their values and beliefs about human health processes and seeking an awareness of patient care approaches (1). It has been argued that nursing theories are idealistic and impractical, and nursing practice is informed by evidence-based practice (EBP) (2, 3). In response to such notions, McCrae (4) argued that nursing theories are as important as EBP. Nursing theories enable nurses to discern and evaluate their essential role in different healthcare settings. Therefore, nurses should value both EBP and Nursing Theory-Guided Practice (NTGP) because the inter-relationship between theory, practice and research is crucial for knowledge development (5, 6). NTGP describes, predicts and explains nursing phenomena and allows nurses to recognise the nature of nursing practice. It serves as a serve tool for personal knowing, reflection, reasoning, critical thinking and effective decision-making (7). Some nursing theories are abstract and may not be testable through empirical research, but theories which can guide both nursing knowledge and practice are needed and essential for improving patient care (8).

Nursing Theory-Guided Practice is defined as a 'human health service to society based on the discipline-specific

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knowledge articulated in the nursing frameworks and theories. The discipline-specific knowledge reflects the philosophical perspectives embedded in the ontological, epistemological, and methodological processes that frame nursing's ethical approach to the human-universe-health process' (9: p. 177). Nursing practice which does not entail the above-mentioned elements and is not guided by nursing theories is referred to as traditional practice. It also includes nursing practice based on medical knowledge. For example, a patient who refuses any medical or nursing treatment would be called noncompliant by many nurses while some nurses may rationally explore the reasons for the patient's refusal and plan the care accordingly. In this example, the former nurses would be practising traditional nursing care because their practice is based on traditional knowledge (6). Colley (10) underscored the need for adaptation of nursing practice and emphasised that nurses should guide their practice and research through the lens of nursing theories, rather than theories of medicine and social sciences. NTGP is essential for the continuous progress of nursing as a discipline and a science and for improving the quality of nursing care. It provides a voice for nurses to articulate what they do for patients and their families and why they do it (11).

Bond et al. (5) examined research published in nursing journals from 2002 to 2006 to determine the extent of the use of nursing theories. They retrieved 2857 articles comprising 2184 (76%) research articles and 673 (24%) theoretical and philosophical papers. Of 2184 research articles, 837 (38%) used different theories as the guiding framework (460 (55%) were nursing theories while 377 (45%) were theories from social sciences and psychology). Many of those studies integrated some of the concepts of nursing theories indicating the consistent use of nursing theories to guide research. However, this review had a few limitations: the authors did not identify specific nursing theories used in those studies, the analysis was limited to publications in some specific nursing journals, and the analysis provided no evidence about the usefulness of NTGP. Fawcett (12) suggested that the comparison of NTGP with traditional nursing practice could corroborate the usefulness of nursing theories in guiding practice and theory appraisal. This kind of comparison is often an aim of experimental designs which are also considered to be the best designs for comparative research in health care, medicine and nursing (13, 14). Therefore, other research designs such as cross-sectional, case studies and other descriptive designs which do not aim to compare different practices cannot be useful for this evaluation. Moreover, in this era of evidence-based practice, experimental designs are also given more weightage over any other kind of research (8). Therefore, to substantiate the usefulness of NTGP and research, analysis should focus on experimental studies that used nursing theories as the guiding framework. This type of analysis would help in substantiating the extent to which nursing theories have guided nursing practice.

Purpose

To examine the research regarding the use of nursing theories as guiding framework in experimental studies and to evaluate the usefulness of NTGP compared to traditional nursing practice.

Methods

An integrative review was used because it allows for compilation of empirical research about a topic and helps determine areas for future research. Unlike systematic reviews, integrative reviews include studies with various purposes that address an overarching phenomenon rather than studies with similar research questions (15). However, because of the nature the research question (i.e. exclusive focus on experimental studies addressing the use of multiple nursing theories in guiding practice), we did not include a mix of qualitative, quantitative and mixed-methods studies. A systematic review and a meta-analysis were not feasible for two reasons: (i) the studies included a range of theory-guided interventions and multiple outcomes, thereby rendering the development of a focused systematic review question impossible and (ii) a meta-analysis is usually conducted after a systematic review and entails mathematical compiling or pooling of individual randomised control trials (RCTs) to seek statistical generalisations (16, 17). Therefore, a meta-analysis of experimental studies requires a focused research question, a systematic review and studies reporting specific interventions targeting one or more outcome variables (16–18).

Data sources

A comprehensive search was performed within CINAHL, Google Scholar, PubMed and Science Direct databases using specific keywords and phrases: 'NTGP intervention/experimental studies', 'NTGP', 'nursing theories and research', 'nursing theories and models in nursing practice' and the names of various nursing theorists such as Rogers, Parse, Watson, Roy, Orem, Newman, Neuman, Meleis, Kolcaba and King along with the term 'experimental studies'. The initial search retrieved 67 073 articles of which 62 004 were book results and duplicate articles that appeared in all the databases. A further search limit and screening excluded 4321 articles including dissertations, discussions, commentaries, descriptive designs, concept analyses and literature reviews. Finally, 744 articles were screened after reading the titles and abstracts which resulted in final selection of 35 articles. The detailed search strategy is presented in Fig. 1.

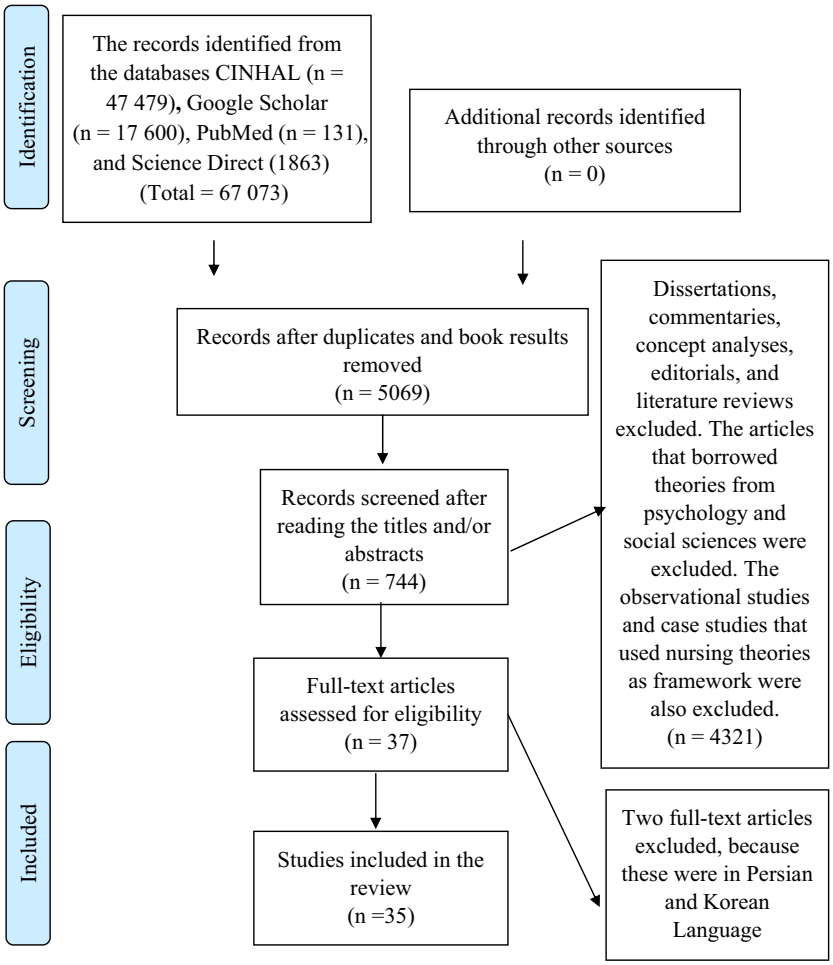

Figure 1 Literature search strategy (adapted from Moher et al. (57) PRISMA http://www.prisma-statement.org).

Inclusion and exclusion criteria

The experimental studies from January 1995 to October 2017 were included. The final selection of the articles was based on the following criteria: (i) studies published in the English language, (ii) experimental studies published in peer-reviewed journals, and (iii) the studies which only used nursing theories developed by nursing theorists/authors as the guiding framework. Editorials, literature reviews, dissertations, commentaries, book reviews and concept analyses were excluded. The articles which borrowed theories from disciplines such as psychology and social sciences and observational studies and case studies that used nursing theories as the guiding framework were also excluded.

Data analysis and compilation

For data compilation and interpretation, the studies were read at least three times to develop a comprehensive understating of the methodology and findings. Literature summary tables were developed and information about authors, country, nursing theory, study purpose, sample size, intervention and its duration, outcome measures and their significances were extracted. Then, the statistical significance of the outcome measures was assessed by considering the p-values, and the confidence intervals and findings were judged to be useful, somewhat useful and not useful, in terms of the number of significant outcome measures. Each author compiled the summary tables separately and then compared their findings. Any arising discrepancies were resolved, and a consensus was reached. The selected studies were appraised using validated critical appraisal checklists proposed by Greenhalgh et al. (19). For data synthesis, the information from the studies was synthesised in relation to the twofold purpose. During this synthesis, we gave more weightage to the strongly rated studies, irrespective of the nature of experimental design.

Study characteristics

The commonly used design were RCTs (n = 19), quasi-experimental designs (n = 11) and pre- and postexperimental designs (n = 4). One study used mixed-methods experimental design, but only quantitative findings were

reported. Most of the studies were conducted in Iran (n = 17), United States (n = 5) and Turkey (n = 5). One study each was conducted in Pakistan, Canada, India, Spain, Sweden, Portugal, Oman and UAE. Fifteen studies were conducted in healthcare centres and clinical settings, 12 studies were conducted in hospital settings, six studies were conducted in community settings, and only one study was conducted in a both education and hospital setting. The sample sizes of the studies ranged from 9 to 100 (Table 1).

Critical appraisal

All of the included studies clearly outlined their research question, purpose, theoretical framework, sample and its characteristics. The conceptual frameworks were well laid out, and theoretical frameworks were appropriately integrated in the study design. All of the studies used valid and reliable data collection questionnaires and indices, which were also pretested in their own settings. The descriptive and statistical analyses employed were pertinent to the research questions. The methodology was also explicitly outlined. All of the studies did not use any kind of blinding except three studies that used the single (20, 21)- and double-blinding (22) approach. The studies which did not use blinding are subject to the chances of intervention contamination. A few studies were pilot in nature (23, 24) which limits their generalisation to other similar populations. A short follow-up time was the major limitation of most of the studies (n = 20). The remaining 15 studies (21, 23–37) used an adequate follow-up time ranging from three to six months.

Of 35 studies, the quality rating was judged to be strong for three studies (20, 22, 38), moderate for 24 studies (21, 24–26, 28–30, 32–35, 37, 39–49) and weak for seven studies (23, 27, 31, 36, 50–53). The major limitation of most of the weakly rated studies was the groups were somewhat noncomparable at the baseline, indicating the chances of selection bias and the chances that the outcomes could have been due to other variables which were not accounted for during baseline comparison. The sample size was small which could have resulted in low statistical power. It was indicated that there was a loss of follow-up, but the strategies to account for the follow-up were not described, thereby leading to the risk of bias. The detailed critique of the studies can be found in Tables 2 and 3.

Findings

What are the commonly used nursing theories and models?

Out of 35 studies, most of the studies used Orem's self-care model (n = 13), Roy's adaptation model (n = 11), Peplau's theory of interpersonal relations (n = 3) and Rogers science of unitary beings (n = 2). Other nursing theories that guided these studies were Watson's caring science (n = 1), King's goal attainment theory (n = 1), Meleis's transitions theory (n = 1), Kolcaba's comfort theory (n = 1), Burkhart's spiritual care theory (n = 1) and the heart failure self-care theory based on Orem's model (n = 1). In total, 26 studies were guided by grand theories which included Roy's adaptation model, Rogers's science of unitary human beings and Orem's self-care model, whereas nine studies were guided by middle range and practice theories.

What contexts and outcome variables were studied?

These studies addressed a wide range of health conditions such as chronic diseases, acute conditions, cardiac and psychological illnesses. Most of the studies focused on patients with heart failure and other cardiac conditions (n = 10), asthma (n = 3), cancer (n = 5), diabetes (n = 2), acute conditions (n = 3) and multiple sclerosis (n = 2). One study each focused on patients with depression, infertility, postpartum, postnatal, fibromyalgia, stroke, burns, limb amputation, dialysis and prostate gland issues. The main outcome variables included the patients' life quality (n = 11), self-efficacy and self-care abilities (n = 7), and stress and coping (n = 7). The remaining outcomes were pain, spiritual care, wound care, fatigue, sleep quality and general nursing care.

What is the difference between nursing theory-guided practice and traditional nursing practice?

All of the reviewed studies investigated the usefulness of NTGP in a variety of nursing settings. We identified three categories of studies: studies comparing NTGP with routine care, studies comparing NTGP with no intervention with the comparison or control group and studies without a comparison or control group. In total, 20 studies compared NTGP with routine/traditional nursing practice (21–23, 25, 28–33, 39, 40, 43, 44, 47–50, 53, 54). A total of 14 studies compared NTGP with no intervention on the control or comparison group (22, 24, 27, 34–38, 41, 42, 45, 46, 51, 52), and only one study did not involve any comparison group (26).

What type of nursing theory-guided interventions was evaluated?

Various nursing interventions were evaluated in these studies. The most common intervention was the integration of nursing theory-guided assessment along with a nursing care plan. For example, Mathew and Devi (46) assessed the effectiveness of Roy's adaptation model-based care in improving the life quality of patients with cervical cancer. The patients were assessed using a tool

Table 1 Study characteristics and findings

Authors/Country	*Theory*	*Design*	*Sample*	*Intervention*	*Duration*	*Outcome*	*Tools*	*Significant outcomes*	*Usefulness*	*Conclusion*
Afrasiabifar et al. (20), Iran	Orem's self-care theory	RCT	Patients with multiple sclerosis EG = 31 CG = 32	Orem nursing process-based care	1.5 months	Fatigue	Fatigue severity scale	1 (Fatigue) (p = 0.001, CI: 4.35–4.73)	SU	The care reduced the fatigue of patients
Farsi & Azarmi (22), Iran	Roy's adaptation model	RCT	Patients with lower extremities amputation EG = 30 CG = 30	Educational intervention	2 months	Coping strategies	Lazarus and Folkman coping strategies questionnaire	6 out of 8 (problem-solving (mean score change 15.40–17.16, p = 0.03), avoidance (15.30–14.0, p = 0.04), distancing (15.33–13.33, p = 0.009), confrontive coping (13.76 to 15.86, p = 0.01), self-controlling (17.46–19.26, p = 0.02), accepting responsibility (10.63–12.26, p = 0.02))	U	The educational intervention improved coping strategies of patients
Artinian et al. (23), USA	Orem's self-care theory	RCT with a qualitative component	Patients with functional class II–III congestive heart failure EG = 9 CG = 9	A web-based monitoring system with medication compliance device	3 months	Weight, blood pressure, activity, heart healthy diet	Heart failure self-care behaviour scale, pill counts, 6-minute walk test and the Minnesota living with heart failure questionnaire	1 (Quality of life (51–38, p = 0.02) lower score indicates greater quality of life	SU	The quality of life improved in patients who used the medication compliance device
Paradis et al. (24), Canada	Situation-specific theory of heart failure self-care based on Orem's self-care model and trans-theoretical model.	Pre- and post-test RCT	Patients with heart failure EG = 15 CG = 15	Motivational interviewing	1 month	Self-care maintenance, management, general self-care management, confidence to perform self-care and conviction to perform self-care behaviours	Self-care of HF-Index, self-care to HF management scale, Therapeutic self-care scale, confidence and Conviction Scale	1 (Confidence of patients in performing HF-specific health care behaviours (68.57–73.02, p = 0.005, effect size = 0.86)	SU	Motivational interviewing was useful for increasing the confidence of patients in performing HF-specific healthcare behaviours, but was nonsignificant in increasing other behaviours
Wengstrom et al. (25), Sweden	Orem's self-care theory	RCT	Women with breast cancer EG = 67 CG = 67	Orem's theory-guided care	3 months	Coping ability regarding structure (ability of appraisal), motivation (degree of emotional involvement), emotional balance and coping	Wheel scale	1 (motivation (8.67 to 8.25 to 8.17, p < 0.05)	SU	The intervention was useful for the patients over 59 years of age

Table 1 (Continued)

Authors/Country	*Theory*	*Design*	*Sample*	*Intervention*	*Duration*	*Outcome*	*Tools*	*Significant outcomes*	*Usefulness*	*Conclusion*
McEwan et al. (26), USA	Meleis's transitions theory	Uncontrolled pre- and post-RCT with a qualitative component	Women with diabetes EG = 15	Diabetes education and social support intervention	6 months	Diabetes knowledge, self-efficacy and health-related psychological and behavioural problems	Diabetes knowledge questionnaire, Medical outcomes, Social support inventory, Self-Efficacy for diabetes scale	3 (Diabetes knowledge (16.27–18.93, $p < 0.001$), self-efficacy (48.33–76.73, $p < 0.001$), and health-related (4.07–2.02, $p < 0.001$) psychological and behavioural problems (3.80–2.67, $p < 0.001$))	U	The education and social support intervention was useful in facilitating the outcomes
Erci et al. (27), Turkey	Peplau's interpersonal relations model	RCT	Surgical patients EG = 60 CG = 60	Spending time with patients in accordance with the interpersonal process of Peplau	1 week	Anxiety	Beck anxiety inventory	1 (Anxiety) (18.5–1.4, $p < 0.001$)	U	The intervention was useful in reducing patients' anxiety.
Altay & Çavuşoğlu (28), Turkey	Orem's self-care theory	RCT	Adolescents with asthma EG = 40 CG = 40	Individualised care plans and home visits	5 months	Personal responsibility in self-care in terms of five behaviours	Newly developed self-care data form	5 (use of asthma drugs (38 using, 2 not using, $p < 0.001$), PEF meter (31 using, nine not using $p < 0.001$), asthma action plan (33 applying, seven not applying $p < 0.001$), daily care schedule (40 keeping, $p < 0.001$) and protection from triggers (10 protected, 30 not protected $p = 0.001$).	U	Nursing theory-based care was beneficial.
Brandon et al. (29), USA	Orem's self-care theory	Pre- and post-test RCT	Patients with heart failure EG = 10 CG = 10	Telephonic delivered patient education	12 weeks	Hospital readmission, self-care behaviours, and quality of life	Minnesota living with heart failure scale and self-care behaviour scale	3 (hospital readmission ($F = 7.63$, $p = 0.013$), self-care behaviours ($F = 21.85$, $p < 0.001$) and quality of life ($F = 5.89$, $p < 0.000$)	U	The use of telephone-led intervention was useful for the patients
Burkhart & Schmidt (30), USA	Hogan spiritual care in nursing practice theory	Pre- and post-test RCT with a programme evaluation component	Nursing students EG = 28 CG = 31	Educational and reflective programme run concurrently with the clinical practicum	13 months	Spiritual well-being, religious well-being, or existential well-being, students' perceived ability in providing spiritual care ($p < 0.05$)	Spiritual Care Inventory, Spiritual Care in Practice survey and Spiritual Well-Being Scale	1 (Increase in students' perceived ability in providing spiritual care (difference score = 5.7, $p < 0.01$)	SU	A nursing theory-based, process-oriented approach was useful for preparing nursing students to integrate spiritual care in their practice
Apay et al. (31), Turkey	Roy's adaptation model	NRCT	Women with postpartum haemorrhage EG = 65 CG = 69	Nursing process-based care	7 home visits over 1.5 months	35 nursing diagnosis under physiological, interdependence, self-concept and role function	Postpartum follow-up outcome form	Of 36 diagnosis, only 22 were evaluated and 20 resulted in improved patient condition ($p < 0.1$ or 0.05)	U	Roy's adaptation model-based care prevented complications associated with postpartum haemorrhage

Table 1 (Continued)

Authors/Country	*Theory*	*Design*	*Sample*	*Intervention*	*Duration*	*Outcome*	*Tools*	*Significant outcomes*	*Usefulness*	*Conclusion*
Arslan-Özkan et al. (21), Turkey	Watson's caring theory	RCT	Women with infertility EG = 52 CG = 53	Watson's caritas process-based care	8 months	Distress, self-efficacy, adjustment	Infertility distress scale, Infertility self-efficacy scale and fertility adjustment scale	3 (distress (39.7–30.2, $p < 0.001$), self-efficacy (28–21.9, $p < 0.001$), and adjustment (25.4–19.1, $p < 0.001$))	U	The theory-based care decreased the negative impact of infertility on women
Khajeh-goodari et al. (32), Iran	Roy's adaptation model	RCT	Patients with heart failure EG = 21 CG = 22	Training programme	3 months	Quality of life, interpersonal support, walk	Minnesota living with heart failure questionnaire, Interpersonal Support Evaluation List and the 6-Minute Walk Test	3 (life quality ($p < 0.001$, CI 42.29–36.69), interpersonal support ($p < 0.001$, CI 19.44–23.59), and walk ($p < 0.01$, CI 0.31–1.73))	U	The training programme was effective for patients
Dahmardeh et al. (33), Iran	Orem's self-care theory	RCT	Patients with multiple sclerosis EG = 39 CG = 39	Supportive educational intervention	4 months	Sleep quality	Pittsburg sleep quality index	1 (sleep quality (12.58–10.38, $P < 0.01$)	U	The supportive educational intervention improved sleep quality of patients
Maghsoodi et al. (34), Iran	Roy's adaptation model	Pre- and post-NRCT	Elderly patients EG = 30 CG = 30	Care plan, education sessions, and direct care	1.5 months	Self-efficacy	General self-efficacy scale.	For intervention group the self-efficacy score increased from 21.56 to 27.41 and for control group the score changed from 21.42 to 21.78 ($p < 0.001$)	U	Roy's adaptation model-based care and education was useful for increasing self-efficacy of the patients
Mohammadpour et al. (35), Iran	Orem's self-care theory	RCT	Patients with MI EG = 33 CG = 33	Supportive educational intervention	1.5 months	Self-care abilities in terms of knowledge, motivation and skills	Myocardial infarction self-care ability questionnaire	3 (knowledge (1.4–2.0, $p < 0.001$), motivation (1.7–2.0, $p = 0.001$), and skills (1.3–20. $p < 0.001$)	U	The supportive educational intervention improved self-care abilities of patients
Zarea et al. (36), Iran	Peplau's interpersonal relations model	RCT with pre- and postdesign	Patients with coronary artery bypass grafting EG = 37 CG = 37	Seven therapeutic communication sessions	2 to 4 months	Anxiety and depression	Hospital anxiety and depression scale	2 (anxiety score decreased from 10.23 to 9.38 ($p < 0.001$) and depression decreased from 11 to 9.13 ($p < 0.001$))	U	Therapeutic communication was useful in reducing patients' anxiety and depression
Onieva-Zafra et al. (37), Spain	Rogers' science of unitary human beings	Pre- and post-NRCT	Patients with fibromyalgia EG = 30 CG = 30	Two guided imagery CDs entailing different relaxation techniques and exercises	2 months	Pain and depression	McGill Pain questionnaire long form and the VAS and depression with the Beck Depression Inventory.	In the intervention group, lower levels of pain (7.66–4.89, $p < .046$) and depression (6.48–34.34, $p < .010$) were noted than the control group at the week 4 evaluation. At week 8, no significant differences were found for pain	U	Guided imagery alleviated patients' pain and depression

Table 1 (Continued)

Authors/Country	*Theory*	*Design*	*Sample*	*Intervention*	*Duration*	*Outcome*	*Tools*	*Significant outcomes*	*Usefulness*	*Conclusion*
Apóstolo & Kolcaba (38), Portugal	Kolcaba's comfort theory	NRCT	Patients with depression EG = 30 CG = 30	Guided imagery	10 days	Anxiety, depression, stress and comfort	Psychiatric inpatients comfort scale and the depression, anxiety and stress scales	All four. The reported power for all the outcomes was 0.92	U	Guided imagery was useful for improving patient outcomes
Bakan & Akyol (50), Turkey	Roy's adaptation model	Secondary data analysis of an RCT	Patients with heart failure EG = 21 CG = 22	Education, exercise and social support programme	3 months	Quality of life, functional capacities, and social support	Minnesota living with heart failure questionnaire, interpersonal support evaluation list and the 6-minute Walk Test.	2 (Improvement in patients' quality of life, functional capacities and social support within the interdependence dimension of the intervention group (each with $p < 0.05$))	SU	The intervention was useful for patients with heart failure
Alimohammadi et al. (54), Iran	Roy's adaptation model	RCT	Patients with stroke EG = 25 CG = 25	Roy's model-based nursing care and educational sessions	2 months		Roy's adaptation model-based questionnaire for measuring physiological care of patients	1 (physiological adaptation (47.4–94.7, $p < 0.0001$))	SU	The care helped patients in adapting to their physiological changes
Hemati et al. (39), Iran	Orem's self-care theory	Pre- and post-NRCT	Adolescents with asthma EG = 32 CG = 32	Five training sessions (45–60 minutes) about nutrition, self-care, fatigue reduction and sleep quality improvement	2 months	Self-esteem	Coppersmith Self-esteem inventory	Self-esteem of patients increased from 28.34 to 31.53, $p < 0.01$) compared to control group 28.12–27.90	U	Orem's model-based care was useful for improving nutrition and decreasing fatigue of patients
Hemati et al. (40), Iran	Orem's self-care theory	Pre- and post-NRCT	Adolescents with asthma EG = 32 CG = 32	Education about asthma and its management, breathing types, proper application of spray and ways to relieve stress.	2 months	Stress	Cohen perceived stress scale	The stress scores in intervention group decreased from 29.18 to 25.46 ($p < 0.05$)	U	The care was useful for decreasing perceived stress adolescents
Borzou et al. (41), Iran	Rogers science of unitary beings	RCT	Patients with diabetes EG = 30 CG = 30	Educational programme	1 month	Quality of life regarding diabetes control, social support, energy and mobility, anxiety and sexual activity	Diabetes specific quality of life scale	3 (diabetes control (8.91–10.13, $p = 0.00$), social support (2.73–4.38, $p = 0.00$), energy and mobility (7.74–11.87, $p = 0.00$))	SU	The educational programme has some benefits for the patients
Hashemi et al. (42), Iran	Orem's self-care theory	RCT	Patients with burn EG = 56 CG = 56	Orem nursing process-based care	1–2 months	Quality of life	Burn Specific Health Scale and quality of life questionnaire	1(Quality of life (73.33–98.12, $p = 0.00$)	U	The self-care programme improved patients quality of life
Karimi et al. (43), Iran	Orem's self-care theory	Pre- and post-NRCT	Patients with colorectal cancer EG = 35 CG = 35	Five training sessions (45–60 min) about nutrition, self-care, fatigue reduction, and sleep quality improvement	3 months	Food habits and fatigue	Food frequency questionnaire, Fatigue inventory	Nutrition habits of patients were improved ($p < 0.0001$) and fatigue was decreased ($p < 0.0001$) compared to control group	U	The care was useful for improving nutrition and decreasing fatigue of patients

Table 1 (Continued)

Authors/Country	*Theory*	*Design*	*Sample*	*Intervention*	*Duration*	*Outcome*	*Tools*	*Significant outcomes*	*Usefulness*	*Conclusion*
Maghsoodi et al. (44), Iran	Peplau's Interpersonal Relations Model	RCT	Patients with coronary artery bypass grafting EG = 37 CG = 37	Peplau's nursing process-based care	2–4 months	Anxiety	Beck Anxiety Inventory	1 (Anxiety (30.35–25.38, $p < 0.001$)	U	Peplau's therapeutic model-based care was reduced patients' anxiety
Maslakpak et al. (45), Iran	Roy's adaptation model	Pre- and post-NRCT	Nursing home residents EG = 30 CG = 30	Care plan and two education sessions to manage maladaptive behaviours	1.5 months	Quality of life	Quality of life questionnaire (SF-36)	For intervention group the quality of life score increased from 43.36 to 67.59 and for control group the score changed from 43.49 to 43.69 ($p < 0.001$)	U	Roy's adaptation model-based care improved quality of life of patients
Mathew and Devi (46), India	Roy's adaptation model	Pre- and post-NRCT	Patients with cervical cancer EG = 30 CG = 30	Oral counselling and an information booklet for improving the life quality	2 weeks	Quality of life	Maladaptive behaviour assessment tool and newly developed quality of life tool	The quality of life score increased from 71.5 to 92.1 ($p = 0.00$)	U	The care was useful in improving the quality of life of patients with cervical cancer
Shahed et al. (47), Iran	Roy's adaptation model		Patients with mastectomy and chemotherapy EG = 35 CG = 34	The intervention included 4 education sessions (45–60) about disease care, exercise, healthy habits and diet, fatigue and stress management	3 months	Marital satisfaction and maladaptive behaviours	Enrich marital satisfaction and Roy's adaptation assessment scale	Marital satisfaction score of the intervention group increased from 6.7 to 5.9 ($p < 0.03$) compared to control group 6.7–8.5	U	Roy's model-based care was useful for patient care
Shearer et al. (48), USA	Rogers science of unitary beings	RCT	Patients with heart failure EG = 45 CG = 45	Telephonic delivered empowerment	6 phone calls over 12 weeks	Self-management, purposeful participation in meeting personal goals and perception of functional health	Power as knowing participation in change tool VII, Ware's short-form health survey and Self-management of heart failure scale	1 (self-management (16.42–19.60, $p < 0.001$))	SU	The intervention was useful in improving self-management of heart failure through self-care activities
Zarandi al. (49), Iran	Orem's self-care theory	RCT	Patients with migraine EG = 43 CG = 40	Orem nursing process-based care	3 months	Quality of life regarding physical functioning, physical role limitation, body pain, general health, vitality, social functioning and emotional role limitation and mental health.	SF36	All with each $p < 0.001$	U	The self-care programme improved patients quality of life
Afrasiabifar et al. (51), Iran	Roy's adaptation model	Pre- and post-test RCT	Patients with haemodialysis EG = 31 CG = 28	Educational booklet	81 sessions over 8 weeks. Outcome assessment at 2 months	Adaptation modes physiological, self-concept and role function modes	Newly developed scale	3 (physiological (68.76–79.15, $p = 0.001$), self-concept (33.31–38.96, $p = 0.03$), and role function mode (29.75–32.93, $p = 0.04$)).	U	The intervention was useful for increasing the patients' adaptation in physiologic, self-concept and role function modes

Table 1 (Continued)

Authors/Country	*Theory*	*Design*	*Sample*	*Intervention*	*Duration*	*Outcome*	*Tools*	*Significant outcomes*	*Usefulness*	*Conclusion*
Khowaja (52), Pakistan	King's systems model	NRCT	Patients with prostate surgery EG = 100 CG = 100	Clinical pathway	4 months	Nursing, physicians, discharge plan, postoperative problems, postoperative complications, finances, and patient and staff satisfaction	NA	12 outcomes	U	The clinical pathway intervention improved patients' outcomes
Raman (53), India	Orem's self-care theory	Pre- and post-NRCT	Postnatal mothers with episiotomy wounds EG = 50 CG = 50	Comparison of 6-hour nurse-led wound dressing with self-perineal care	4 days	Wound healing	Redness, oedema, Discharge from Episiotomy site, Approximation Scale (REEDA) and self-perineal care checklist	Self-care group had increased episiotomy care healing compared to wound care group ($p < 0.05$)	U	Orem's self-care model-based care was useful

designed to measure physiological needs, self-caring behaviours, daily role functioning and the ability to perform daily activities with or without support from family. The intervention consisted of counselling and social support sessions and the postassessment was performed using the same tool. Hemati et al. (39) and (40) investigated the outcome of Orem's self-care model-based care on self-esteem and the perceived stress of patients with asthma. The patients were assessed using a self-care needs assessment form and then education was provided about asthma and methods of controlling symptoms, effective breathing types (diaphragmatic and lip-bud), proper application of spray, and ways to relieve stress and anxiety and improve self-esteem. Karimi et al. (43) assessed the effect of self-care theory-based care on the nutrition and fatigue of patients with colorectal cancer. The assessment explored the desire for self-care, self-awareness and skills for managing nutrition and fatigue. The intervention consisted of a training and a supportive session about nutrition, fatigue reduction techniques, sleep quality improvement and self-care.

Other interventions included the use of web-based monitoring and teaching, telephonic education sessions, face-to-face education sessions, supportive educational sessions, educational booklets, clinical pathways and education sessions conducted using CDs/DVDs. For example, Artinian et al. (23) used a web-based monitoring and education system to improve the patients' compliance with home care for congestive heart failure. This system included a medication compliance device linked with patients' telephone line. The device encouraged the patients to eat heart healthy diet, engage in exercise answered their questions regarding self-care and emergency symptoms. The clinicians read patient's data and answered their questions in a timely manner. Erci et al. (27) determined the effectiveness of Peplau's interpersonal relations model by spending time with the patients and discussing their anxieties about their surgery. The intervention was aimed at improving the therapeutic relationship of nurses and patients so that patients could share their concerns openly. Brandon et al. (29) also studied the usefulness of a nurse-led telephone intervention on hospital readmission, life quality and the self-care of patients with heart failure. Through telephone conversations, the nurses educated patients about HF, smoking cessation, low sodium diets, emergency signs for calling a doctor and flu/pneumonia vaccination. Khowaja (52) studied the use of clinical pathway integration for care of patients with transurethral prostate resection surgery. This pathway included variances and outcomes such as electrolyte imbalance, phlebitis, constipation and urinary tract infection related to nursing, physicians, discharge plan, postoperative problems, postoperative complications, finances, and patient and staff satisfaction. McEwen et al. (26) determined the effect of transitions

Table 2 Quality checklist for randomised control trials

Authors	*Clear and focused question*	*Adequate & rigorous group allocation*	*Baseline measures*	*Comparable study groups*	*Valid primary outcome measure*	*Reliable primary outcome measure*	*Contamination of intervention*	*Blinding*	*Follow-up >80%*	*Long follow-up for outcome measurement*	*Rating*
Wengstrom et al. (25)	Y	Y	Y	N	Y	Y	N	N	Y	Y	M
Artinian et al. (23)	Y	Y	Y	Y	N	N	Y	N	Y	Y	W
Erci et al. (27)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	W
McEwan et al. (26)	Y	N	N/A	N/A	Y	Y	N/A	N	Y	Y	M
Shearer et al. (48)	Y	Y	Y	Y	Y	Y	N	N	Y	N	M
Bakan & Akyol (50)	Y	Y	Y	Y	Y	Y	N	N	Y	N	W
Brandon et al. (29)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	M
Paradis et al. (24)	Y	N	Y	Y	Y	Y	N	N	Y	Y	M
Burkhart & Schmidt (30)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	M
Altay & Çavuşoğlu (28)	Y	N	Y	Y	Y	Y	N	N	Y	Y	M
Zarea et al. (36)	Y	Y	N	N	Y	Y	Y	N	Y	Y	W
Arslan-Özkan et al. (21)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	M
Hashemi et al. (42)	Y	Y	Y	Y	Y	Y	N	N	Y	N	M
Zarandi et al. (49)	Y	Y	Y	Y	Y	Y	N	N	Y	N	M
Maghsoodi et al. (44)	Y	Y	N	N	Y	Y	N	N	Y	Y	M
Alimohammadi et al. (54)	Y	Y	Y	N	Y	Y	N	N	Y	N	M
Mohammadpour et al. (35)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	M
Khajeh-goodari et al. (32)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	M
Dahmardeh et al. (33)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	M
Afrasiabifar et al. (20)	Y	Y	Y	Y	Y	Y	N	Y	Y	N	S
Farsi et al. (22)	Y	Y	Y	Y	Y	Y	N	Y	Y	N	S

Key: Yes = Y, no = N, unclear = UC, weak = W, moderate = M, strong = S.

theory-guided intervention on the health–illness transition of Mexican women with diabetes. This intervention included educational and social support sessions with patients to increase their knowledge, social support and self-efficacy and to decrease psychological- and health-related behaviours.

Zarandi et al. (49) assessed how Orem's model-based care can affect the life quality of patients with migraines. They determined patients' self-care needs in terms of nutrition, activity, stress control techniques and sleep enhancement and then implemented a supportive developmental programme about migraines, activity, nutrition and relaxation techniques. The life quality was measured in terms of physical functioning, pain, general health, vitality, social functioning and physical and emotional role limitation, and the mental well-being of patients. Mohammadpour et al. (35) studied how a supportive educational intervention affects the self-care abilities of patients with myocardial infarction (MI). The education session included information about the functions of

Table 3 Quality checklist for quasi-experimental designs

Authors	*Clear question*	*Randomisation possible*	*Intervention independent of changes over time.*	*Sufficient data to enable reliable statistical inference*	*Correct statistics*	*Valid primary outcome*	*Reliable outcome*	*Intervention may have affected data collection*	*Blinding*	*Follow-up >80%*	*Long follow-up to measure the impact of primary outcome*	*Rating*
Khowaja (52)	Y	Y	N	Y	Y	Y	Y	N	N	N	UC	W
Apóstolo & Kolcaba (38)	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	S
Afrasiabifar et al. (51)	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	W
Apay & Pasinlioglu (31)	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	W
Borzou et al. (41)	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	M
Maslakpak et al. (45)	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	M
Maghsoodi et al. (44)	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	M
Raman (53)	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	W
Onieva-Zafra et al. (37)	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	M
Hemati et al. (39)	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	M
Mathew & Devi (46)	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	M
Hemati et al. (40)	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	M
Karimi et al. (43)	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	M
Shahed et al. (47)	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	M

Key: Yes = Y, no = N, unclear = UC, weak = W, moderate = M, strong = S.

cardiovascular system, the aetiology, risk factors and management for MI, and their adherence to treatment and dietary routines. After the assessment, the self-care abilities were measured in terms of their knowledge, motivation and skills. Shahed et al. (47) studied the usefulness of a supportive educational intervention concerning the marital satisfaction of patients with mastectomies who were undergoing chemotherapy. They conducted educational sessions about disease and its care, exercise, healthy habits and diet, fatigue management and stress and then determined the satisfaction level of patients.

How useful were nursing theory-guided interventions?

In total, 26 studies found nursing theory-guided interventions to be useful (Table 1), nine studies found nursing theory-guided interventions somewhat useful (in this review 'somewhat useful' interventions were defined as those interventions which improved only one of the outcome variables) (Table 1), and none of the studies reported nursing theory-guided interventions as not being useful at all.

The three strong studies reported that nursing theory-guided interventions were useful and effective for improving patient health outcomes. For example, Afrasiabifar et al. (22) studied the effect of Orem's self-care can be used to reduce fatigue in patients with multiple sclerosis. They developed a nursing care plan. The care plan evaluation and redevelopment continued for one month over six sessions of 45–60 minutes. The researchers noted significant pre- and postdifferences ($p < 0.05$) in fatigue of the patients in intervention group and compared to the control group ($p < 0.05$). This study found significant differences in all of the studied outcomes. On the other hand, Farsi and Azarmi (23) studied how education can improve the coping strategies of veterans with limb amputations. They assessed the patients' coping strategies such as avoidance, positive reappraisal, distancing and

seeking social support and then identified their maladaptive behaviours in terms of meeting physiological needs, self-caring behaviours, daily role functioning and ability to perform the daily activities with or without support from family and friends. The educational programme resulted in significant score differences between the two groups in dimensions of coping strategies ($p < 0.05$), but no differences in scores of social support seeking and positive appraisal ($p > 0.05$). Apóstolo and Kolcaba (38) determined the usefulness of guided imagery for decreasing depression, anxiety and stress and increasing comfort in patients with depressive disorders. They invited the intervention group to engage in daily deep breathing exercises, muscle exercises, and showed them image relaxing scenes, best people in life and other comforting images. The outcomes were measured after 10 days. This intervention resulted in has lower levels of depression, anxiety and stress ($p = 0.00$), and higher levels of comfort scores in the intervention group compared to the comparison group ($p = 0.00$). Since all of the strongly rated studies found nursing theory-guided interventions effective compared to the traditional nursing interventions, it is apparent that nursing theory-guided practice was useful. In support of these strongly rated studies, other moderately rated studies also support this usefulness of NTGP. For example, Bakan and Akyol (50) developed an education, exercise and social support programme based on Roy's adaptation model for persons with heart failure. The programme was conducted for three months and reported significant improvement in patients' quality of life ($p < 0.05$), their functional capacities ($p < 0.05$) and social support within the interdependence dimension in patients ($p < 0.05$). Dahmardeh et al. (33) developed an educative-supportive nursing system and studied its effect on the self-care abilities and practices of patients with multiple sclerosis regarding their quality of sleep. They reported an improvement of patients' sleep quality in the interventional group compared to the control group ($p = 0.004$).

Nine studies reported that nursing theory-guided interventions were somewhat useful for patients. For example, Paradis et al. (24) studied how motivational interviewing affects the self-care activities of patients with heart failure. The motivational interviewing was conducted at the time of discharge, the 5th day after discharge and 10th day after discharge. This intervention was useful for increasing the confidence of patients in performing HF-specific healthcare behaviours, but was nonsignificant in increasing other behaviours. Burkhart and Schmidt (30) determined the effect of an educational and reflective programme to enhance students' abilities to provide spiritual care and to improve their own spiritual well-being. This programme was run in parallel with a clinical role transition practicum. The authors found no differences in spiritual well-being, religious well-being or existential well-being of the students in the intervention and control groups, but there was a significant increase in students' perceived ability to provide spiritual care ($p < 0.05$). Shearer et al. (48) examined the usefulness of an empowerment session delivered via telephone on the health outcomes of patients with heart failure. The nurses made phone calls to the patients and supported and encouraged them to focus on their goal attainment and self-management strategies in order to increase their perceptions of functional health. The authors found significant differences in self-management ($p < 0.001$) between intervention and control groups. However, no differences were noted in purposeful participation and perceived functional physical health. Afrasiabifar et al. (51) studied the usefulness of Roy's adaptation model-based education on adaptation of patients with haemodialysis. An educational booklet about self-care was given to the patients. This intervention was extended for 81 sessions over 8 weeks. There were significant differences noted in the mean scores of physiological, self-concept and role function mode between the interventional and control groups ($p = 0.01$, $p = 0.03$, $p = 0.04$, respectively), but no significant difference existed in interdependence modes.

Discussion

The purpose of this review was to determine the extent of the use of nursing theories in guiding experimental research and to evaluate the usefulness of NTGP in comparison with traditional practice. The findings are discussed in relation to the twofold purpose. Regarding the extent of the use of nursing theories, most of the studies used Orem's self-care and Roy's adaption model, which implies that these models may be easier to apply in real-life practice compared to other models and theories. Although the selection of a theory is mainly based on the type and the nature of research questions, the level of theory abstraction could be a factor taken into consideration for using nursing theories as the guiding framework for experimental studies. The frequent use of these theories in research could be because of the simplistic language used in these theories. However, other grand theories use esoteric language therefore are difficult to apply in real-life practice (55). Some possible ways to make such grand theories more relevant to everyday nursing could be (a) to revisit the language used in such theories and present them in a more practical manner, (b) to combine concepts of different grand theories which are based on the same paradigm and develop practice and midrange theories, and c) empirically test selected concepts and relational statements of these theories and present them as research frameworks rather than as practice theories. Future research could focus on the development of such synthesised nursing theories and their evaluation and testing for research and practice.

Regarding the types of nursing interventions, a variety of tools, monitoring systems, and educational, support, guided imagery, counselling, and self-care management programmes were developed, implying that the nursing theories can guide the development of interventions for managing multifaceted human health problems. Among several types of interventions, the integration of nursing theories into the nursing care process was quite consistent. This indicates that nursing process can serve as a simplistic framework for the application of nursing theories because it allows nurses to assess, plan, implement and evaluate their care. Therefore, nurses can integrate this approach to inform their practice. Future research can further explore the use of nursing process-based NTGP and the strengths and limitations of using nursing process as an integrative component for NTGP.

Interestingly, there is a decrease in the number of studies that evaluated nursing theory-guided interventions in the recent years which imply two things. First, nursing researchers do not consider nursing theories useful anymore. It could be attributed to researchers' and practicing nurses' beliefs that nursing theories are not relevant to day to day nursing practice (55). Second, there is a limited emphasis placed on the nursing theories and their application in nursing curricula. These findings are consistent with those of another bibliometric review regarding the use of nursing models from nursing education, administration and practice during the years 2005 to 2009 and 2010 to 2014 (56). The authors reported that nursing theories are not widely used in countries other than China. Bond et al. (5) also reported that despite the increase in the use of theories from other disciplines, the use of specifically nursing theories and models in research and practice had declined. Therefore, application of these theories in various settings and cultures is needed to examine their usefulness. Most of the reviewed studies included NTGP for patients with chronic illnesses, thereby leaving a research gap for the application and evaluation of NTGP in acute and emergency care situations. Additionally, almost all of the strongly and moderately rated studies used quantitative experimental designs which are useful for determining the usefulness of NTGP in statistical terms, but provides no information about the feasibility sustainability of these interventions from providers' and receivers' perspectives. Therefore, further NTGP evaluation type studies may include an additional qualitative component (i.e. use a mixed-methods intervention or evaluation design) for explanatory purposes in order to determine the feasibility and sustainability of tested interventions.

Regarding the usefulness of NTGP, the review indicated that NTGP resulted in promising outcomes compared to traditional nursing practice. Overall, nursing theory-guided interventions improved all of studied outcomes in 26 studies and at least one outcome in nine studies. All of the strongly rated studies found that NTGP was useful compared to routine nursing practice. The moderately rated studies also indicated the usefulness; however, most of these studies did not use a comparison group which limits the broader generalisations of these studies, and warrants further testing and evaluation. Several of the moderately rated studies did not compare NTGP with routine care, did not use blinding and had small samples, which could have led to low statistical power and may limit the generalisability. However, the number of statistically significant outcomes in strongly and moderately studies implies that the chances of power loss were minimum. These studies also provided comprehensive discussions about the sample characteristics, settings and demographic, primary and secondary variables, which limits the possibility of alternative explanations arising from the effects of other unaccounted variables. Therefore, the studies substantiate the usefulness of NTGP. Given these limitations and because of only three strong studies, it is recommended that future studies should consider the limitations reported in the reviewed studies to further test the usefulness of NTGP, especially studies with larger samples and comparison group are needed.

Limitations

Despite many experimental studies, a systematic review was not conducted due to the differences in the nature of research questions, sample, sample characteristics and the diseases studied in the reviewed studies. A wide range of literature could not be included because of the nature of the study question which may limit the complete understanding of the topic. Although this review indicates the usefulness of NTGP in general, the findings are not helpful for researchers who want to learn about the usefulness of specific nursing theories and models. Therefore, future studies and reviews should be conducted to address this gap. Throughout the quality assessment and synthesis, subjective judgements were made which could have introduced researcher bias at any stage of the review. Therefore, findings should be interpreted with caution.

Conclusion

Nursing theories have been used to guide practice in both eastern and Western countries, and NTGP has been useful compared to traditional nursing practice. The findings also indicate that although most of the nursing theories were developed in the United States, they were used to guide research and practice in other parts of the world, showing the cross cultural utility of these theories. This implies that nursing theories are invaluable for guiding nursing practice and research across a wide range of cultures and nursing settings. Therefore, nurses should continue to guide their nursing practice through the lens of

nursing theories and nursing researchers should continue to evaluate the effectiveness of NTGP.

Author contributions

AY conceived the idea; AY performed the literature search; AY and SQ extracted the data and reviewed the manuscript; AY and SQ wrote the manuscript and made revisions to the manuscript.

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