Original article

Effect of Follow-up Telephone by Enterostomal Nurses on Patients with Permanent Colostomy: A Systematic Review

Herlina Semi[1], Sitti Syahriani Sambari[2], Yuliana Syam[4], Andi Masyitha Irwan[4]

Abstract

Background: Patients with permanent colostomy experience quality of life (QoL) decrease, complications, and colostomy adjustment problems. Technology-based interventions can be provided with telephone follow-up (TFU) to provide health education and advice on managing symptoms, identifying complications, and providing quality care services.

Objective: To systematically describe and assess the effect of TFU on permanent colostomy include population, model and duration, instruments used, and effect of TFU.

Materials and Methods: A systematic review was carried out using the Randomized Controlled Trial (RCT) approach in eight databases, including PubMed, Proquest, ScienceDirect, EBSCOhost, CANCERLIT, Wiley, Gray literature, and Scopus, to identify studies reported in English, published in the last ten years, available full text, and about TFU in permanent colostomy patients.

Results and Discussion: Based on the 11 RCT articles analyzed, it was found that the TFU duration ranged from 27 days to 3 years. The TFU improved self-efficacy, QoL, colostomy adjustment, self-care, self-management, service satisfaction, and complications.

Conclusion: The TFU has more effect on self-efficacy, QoL, and complications in patients with a permanent colostomy, and effective TFU was performed for at least three months. Further research is needed on the frequency or duration of telephone calls.

Keywords: *Telephone follow up; Cancer Colorectal; Permanent Colostomy; Enterostomal therapy*

Bangladesh Journal of Medical Science Vol. 21 No. 01 January'22 Page : 54-66
DOI: https://doi.org/10.3329/bjms.v21i1.56327

Introduction

Colorectal cancer (CRC) is the fourth most common form of cancer globally and accounts for approximately 700,000 death annually; in the United States, in 2017, 50,260 people died from CRC [1]. Colorectal cancer is more common in men and detected at 50 or more [2]. In Indonesia, in 2012, CRC in men was in third place after lung and prostate cancer, while in women, it was second to breast cancer [3]. If CRC compromises the rectum and the gastrointestinal tract, then a colostomy is the best course of action [2]. Colostomy often makes patients feel abnormal and have difficulties in self-care [4], and can cause a decrease in QoL [5] including physical, psychological, social, and spiritual aspects [4], and several other problems such as sexual satisfaction

1. Herlina Semi, BSN, RN, Hasanuddin University Teaching Hospital Makassar and Faculty of Nursing, Hasanuddin University Makassar, South Sulawesi, Indonesia, 90245. Email: lynaqc@gmail.com
2. Sitti Syahriani Sambari, BSN, RN, Community Health Center Poasia Kendari and Faculty of Nursing, Hasanuddin University Makassar, South Sulawesi, Indonesia, 90245. Email: st.syahriani@gmail.com
3. Yuliana Syam, DR, BSN, RN, MH, Lecturer, Faculty of Nursing, Hasanuddin University, Jl. Perintis Kemerdekaan KM 10, Tamalanrea, Makassar-Indonesia, 90245. Email: yulianasyamuh@gmail.com
4. Andi Masyitha Irwan, PhD, RN, MAN, Lecturer, Faculty of Nursing, Hasanuddin University, Jl. Perintis Kemerdekaan KM 10, Tamalanrea, Makassar-Indonesia, 90245. Email: citha_ners@med.unhas.ac.id

Correspondence: Andi Masyitha Irwan, PhD, RN, MAN, Lecturer, Faculty of Nursing, Hasanuddin University, Jl. Perintis Kemerdekaan KM 10, Tamalanrea, Makassar-Indonesia, 90245. Email address: citha_ners@med.unhas.ac.id

and skin problems [6]. Besides, the majority of patients (63%) had peristomal skin complications [7] for 21 to 40 days after colostomy [8]. Other complications of the stoma include prolapse, retraction, varicose veins, and peristomal hernias. A peristomal hernia is an unavoidable complication that dramatically affects QoL and patient comfort [9]. About 70% of patients with a stoma have complications, and the risk of complications remains for life [10]. The majority of stoma complications occur within one year after colostomy surgery, so the monitoring by the Wound, Ostomy and Continence (WOC) nurse and regular follow-up should be considered as a strategy to prevent peristomal complications [11]. Nurses play an important role to maintain patients' ability in performing self-care[12], including adjusting with their colostomy. The transition from hospital to home after colostomy surgery can be difficult for the patient [13] as it takes time to adjust to the colostomy.

After a colostomy, most of the complications can be reduced by providing nurse education and follow-up programs by Enterostomal Therapy (ET) nurses to improve patient QoL [14]. The need for follow-up should refer to the knowledge and skills of the ET nurses [15]. Various educational intervention models that can be provided by ET nurses include education to improve psychosocial skills and self-management [16], group discussion on colostomy self-care curriculum using a chronic care model to improve Health Related Quality of Life (HRQOL) and self-management [17], experience-sharing group education programs including stoma care and social activities to improve QoL [18], and structured education to improve QoL and reduce costs [19]. Thus, the vital role of the interaction between the ET nurses and structured follow-up in the first year after a colostomy is to improve QoL and reduce the severity of peristomal skin conditions (PSCs) and the cost of care [13].

Follow-up can be conducted using technology, including by telephone. By using technology, such as mobile phones, patients can manage their chronic disease [20]. Service, combined with the telephone's use, is an efficient way of providing verbal support after treatment as nurse-led calls are acceptable, appropriate, and effective [21]. Telephone calls by nurses are highly recommended in returning patients' follow-up, as they are a confident, convincing, fast communication method [13] that can encourage open discussion about patient problems and allow nurses to offer the necessary solutions [22]. However, in communicating with patients to improve their self-care quality, nurses need good communication skills [23]. Telephone follow-up is an excellent way to exchange information, provide health education and advice on symptom management, assurance, and high-quality services, and recognize complications [24]. Nurse-led TFU in post-discharge patients provides satisfactory service [25]. The follow-up by nurses on cancer patients can provide psychological support [21], satisfaction, safety, improved QoL [26], and information on treatment protocols [27]. Telephone follow-up is a substitute for routine follow-up in the hospital by monitoring the side effects of treatment and providing education for cancer patients [28]. Telephone follow-up becomes a method of providing satisfactory service lasting 10-15 minutes and reducing hospital visits [22]. The optimal follow-up method is unknown, but regular telephone follow-ups, home visits, and hospital-based consultations by ET nurses can address various patient problems such as diet and patient confidence [29]. Colostomy patients receiving intensive TFU had fewer complications, improved QoL, and better service satisfaction after three months [14], and showed to be cost-effective and accepted by most patients [30].

Several studies have revealed the benefits of TFU in patients with a permanent colostomy. However, those studies were only in small-scale qualitative research and not randomized [31], and had not revealed the duration of the intervention [16], the type of intervention, the scale of outcome measures, and the evaluation of the effect of TFU furtherly [18,19]. Therefore, a further systematic review of the effects of TFU on permanent colostomy patients is needed. This review aimed to systematically describe and assess the effect of TFU on people with permanent colostomy includes the population, model and duration, instruments used, and effect of TFU. The RCT review article is the best type of study to determine the causal between intervention and effect [32].

Methods

This systematic literature review uses a systematic method to analyze various research articles using the PRISMA checklist guideline 2009 [33]. Literature searching was conducted in eight databases: PubMed, Proquest, Sciencedirect, EBSCO host, CANCERLIT, Wiley, Gray literature, and Scopus. The clinically relevant questions were based on PICO (patient, intervention, comparison, and outcome) [34], [35] (P: permanent colostomy patient, I: Telephone follow-up, C: Usual care, O: -). Keywords were based on the combination of the MeSH terms and free terms

(Table 1). The research question was, "what is the effect of providing telephone follow-up in patients with a permanent colostomy?".

Table 1. Description of keywords used in the literature searching with the PICO method (patient, intervention, comparison, and results)

Component PICO	
P	Cancer Colorectal OR colostomy permanent OR Colostomies OR ostomy OR stoma OR Enterostomal After surgery OR After hospital discharge
I	Telephone follow up OR telephone intervention OR telephone cancer support OR Nurse telephone
C	Usual care OR standard follow up.
O	-

From the eight databases' searching results, 1566 abstracts were identified, published from 2010 to 2020, RCTs, and all subjects were human. We excluded 437 duplicates, 53 unavailable full texts, 1059 irrelevant, 3 non-English, and 3 non-RCT. The inclusion criteria were (1) Types of intervention that focused on telephone follow-up (2) Full text, English, and RCT articles (3) published in the last ten years. Thus, only eleven RCT articles met the inclusion criteria (Figure 1) described the study inclusion process.

The information extraction included authors, year, method, objective, participants, intervention, outcome, and result. A description of the data handling method and study results is shown in Table 2.

Table 2. Description of the study on the effect of TFU interventions in permanent colostomy patients after treatment

Author (year) Country and Quality Score	Research Design	Objective	Participants	Interventions	Outcome measure	Results
Wen *et. al* (2019), China **1** [45]	RCT	To determine the effect of a transtheoretical model (TTM) based intervention	Ninety-two permanent colostomy patients had received surgical treatment, with 47 per group.	Treatment was conventional and received four follow-up TTM-based intervention sessions by trained nurses. Consisting of face-to-face interviews at baseline, two days, 1 and 3 months after discharge. Evaluation at six months of follow-up by telephone contact.	Significant improvement (p <0.05) in self-management ability and self-efficacy.	Significant (p <0.05) improvement in self-management ability and self-efficacy for up to 6 months.
Wang *et. al* (2018), China **1** [48]	RCT	To explore the effect of the mobile care application out of the hospital.	203 patients with permanent colostomy after surgery, control group (n = 103) and intervention group (n = 100).	The ET nurse's mobile application, routine care, and home care measured psychosocial adjustment, self-efficacy, and stoma complications before the intervention, at 1, 3, and 6 months.	Patient demographics and clinical characteristics, psychosocial adjustment, stoma self-efficacy, and associated stoma complications.	The rates of psychosocial adjustment (p = 0.001) and self-efficacy were significantly higher at 1, 3 and 6 months (p <0.05) and stoma complications tended to decrease (p = 0.40) at 1, 3 and 6 months.
Zhang *et. al* (2020), China **1** [42]	RCT	For socio-demographic and clinical characteristics Ostomy self-management and self-efficacy) explored the effects of a family-hospital holistic care model based on Timing It Right (TiR).	119 patients with permanent colostomy, intervention group (n = 60) and control group (n = 59).	Routine care, follow-up, and TiT-based interventions. Before the intervention, the assessment was carried out at home, 3 and 6 months after going home, and did not continue the call.	Resilience, self-care abilities, complications, and QoL.	At 3 and 6 months after discharge, endurance, and QoL, self-care abilities were better, and complications were significantly lower (p <0.05). Especially QoL (p <0.01).

Author (year) Country and Quality Score	Research Design	Objective	Participants	Interventions	Outcome measure	Results
Harrison-Hos (2011), Australia **1**[47]	RCT	To determine the effectiveness of supportive telephone interventions (CONNECT).	75 patients had undergone CRC surgery (any stage), the intervention group (n = 39) and the control group (n = 36).	Received five phone calls (CONNECT) from a specialist colorectal nurse within six months of treatment.	Unmet needs for supportive care, utilization of health services, and QoL at 1, 3, and 6 months after discharge.	The difference was not significant in need for supportive care. At six months, total QoL was higher (5.7) clinically relevant difference, hospital admission 47% was clinically significant after six months.
Xia (2020), China **1**[49]	RCT	To examine the effect of the information-based integrated hospital-family integration model.	155 colostomy patients, intervention group (n = 81) and control group (n = 74).	Ongoing care integration of information-based families (WeChat, blog, QQ, telephone) model. Follow up month to 1.3.	Data and instruments regarding necessary information, State-Trait Anxiety Inventory (STAI), self-efficacy, colostomy complications, QoL, and satisfaction.	Significantly had less anxiety and had better self-efficacy (p = 0.001) and QoL all dimensions (p = 0.05), and fewer complications (p <0.0001). And satisfaction with the treatment model (p <0.0015) after three months.
Hawkes *et. al* (2013) Australia **1** [43],	RCT	To find out the impact of telephone intervention (CanChange).	Four hundred ten sufferers of CRC with 205 per group.	The health coaching intervention (11 health coaching delivered by theory-based telephone) focused on physical activity, weight management, diet, alcohol, and smoking for six months.	Primary assessments: physical activity, HRQoL, and cancer-related fatigue. Secondary outcomes: body mass index, diet, and alcohol intake at baseline, 6, and 12 months.	Significant effect of the intervention on physical activity (p = 0.003) at 6 months and physical HRQoL (p = 0.07) at 6 or 12 months.
Young *et. al* (2013), Australia **1** [44]	RCT	To investigate the effectiveness of centralized telephone-based services by nurses.	775 CRC patients, intervention group (n = 398) and control group (n = 377).	Received standard calls from a centralized nurse 3 and 10 days and 1, 3, and 6 months after discharge from hospital.	Supportive care needs, the experience of care coordination, unplanned readmissions, emergency department presentations, distress, and QoL at 1, 3, and 6 months.	There was no significant difference in the need for supportive care, 27.9% unplanned readmission (p = 0.5) and QoL (p] p = 1.0).
Zhang *et. al* (2013), China **1**[50]	RCT	To evaluate the effect of follow-up, call the ET nurse after discharge.	103 patients who had colostomy surgery, the intervention group (n = 52) and the control group (n = 51).	Receive routine discharge care and 2-3 nurse phone calls within the follow-up period.	Ostomy Adjustment, Stoma Self-efficacy Scale, Satisfaction with stoma care, and complications.	Much better ostomy adjustment (p = 0.049), self-efficacy (p = 0.002), higher satisfaction with services (p = 0.0001), and 56.6% fewer stoma complications (p = 0.044) after 3 months.

Author (year) Country and Quality Score	Research Design	Objective	Participants	Interventions	Outcome measure	Results
Prachami-Ahmadi (2016), Iran **2** [40]	RCT	This figure is to determine the effect of telenursing by nurses.	70 patients with permanent colostomy, (n = 35) per group	Attends a training session as usual and is consulted by telephone for three months	QoL was measured at the intervention's baseline and 16 weeks with the QoL-Ostomy City of Hope questionnaire.	There was a significant difference in QoL of physical (p = 0.007), mental (p = 0.001), and social (p = 0.01), there was no significant difference in spiritual aspects (p = 0.111). Overall significantly effective at QoL (p = 0.001).
Beaver *et. al* (2012), England **1** [46]	RCT	To explore the potential benefits of follow-up calls by nurses.	65 patients with CRC completed treatment (surgery, radiotherapy, chemotherapy), the intervention group (n = 32) and the control group (n = 35).	Patients receive follow-up calls by nurses regarding changes in condition, symptoms, disease spread, medication, side effects, genetic risk, sexual attractiveness, sexual function, self-care, support groups, and financial and family problems: four intervention and feedback sessions.	Primary outcomes: psychological morbidity, meeting information needs, and satisfaction with information and services. Secondary outcomes: clinical investigation, time to recurrent disease detection, and cost.	There was no significant difference between groups on STAI (p = 0.297) or GHQ-12 (p = 0.626). satisfaction was higher (p = 0.029). Consultation time in hospital was shorter (median 14.0 minutes, (p = 0.001), and costs decreased (range £ 5-11, € 5.70-12.53).
Jefford *et. al* (2016), USA and Australia 2 [41]	RCT	To see the effects of Survivor care (SC) Interventions.	221 CRC patients after surgical treatment intervention group (n = 110) and control group (n = 111).	Usual care (UC) or UC plus SC and follow-up calls after 1, 3, and 7 weeks.	Psychological distress, supportive care needs (SCNs), and QoL.	QoL was the same in both groups, but the SC group was more satisfied with the treatment (p = 0.05).

Note : score quality: 1 =strong rating, 2 =moderate rating, 3 =weak rating

Furthermore, to assess the feasibility of the articles to be included in the study, the Critical Appraisal Skill Program (CASP) was conducted [36], (Table 3),

Table 3. Critical Appraisal

No	Critical Appraisal Intervention [36]	45	48	42	47	49	43	44	50	40	46	41
1	Does the research focus on the problem?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Was the selection of patients for the study divided randomly?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Were all patients involved in the study accounted for to the end?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Is the patient, staff, or researcher blind?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	No
5	Were the patient characteristics the same from the start of the study?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

No	Critical Appraisal Intervention [36]	45	48	42	47	49	43	44	50	40	46	41
6	Apart from the intervention provided, were both groups taken into account?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	Are the effects of the intervention quantified?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	Is it possible to quantify estimates of the effect of the intervention?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Are all clinical results applicable to the population?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	Are all clinical outcomes important to consider?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	Are the benefits of this research worth the costs and losses?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell
	Level of evidence; grade of recommendation [37]	1b; A	1b; A	1b; A	1b; A	1b; A	1b; A	1b; A	1b; A	1b; A	1b; A	1b; A

and the Center for Evidence-Based Medicine (CEBM) [37] (Table 4).

Table 4. Synthesis of Evidence Regarding TFU

Articles	Citations in Study	Level of Evidence [37]	Grade of Recommendation
[45], China	1	1b	A
[48], China	9	1b	A
[42], China	0	1b	A
[47], Australia	31	1b	A
[49], China	1	1b	A
[43], Australia	141	1b	A
[44], Australia	53	1b	A
[50],China	36	1b	A
[40], Iran	1	1b	A
[46], England	43	1b	A
[41], USA and Australia	25	1b	A

The assessment of the quality of the study to identify the risk of bias of included studies was based on the Cochrane Risk of Bias Tool: + (Low risk of bias), - (High risk of bias), ± (Unclear risk of bias) (Table 5) [38]

Table 5. Cochrane Risk of Bias Tool

	Cochrane risk-of-bias domain	45	48	42	47	49	43	44	50	40	46	41
1	Random process and allocation	+	+	+	+	+	+	+	+	+	+	+
2	Blind participants and researchers	Single blind	Single blind	Double blind	Single blind	Single blind	Single blind	Single blind	Single blind	Can't tell	Single blind	No blind

	Cochrane risk-of-bias domain	45	48	42	47	49	43	44	50	40	46	41
3	Blind the results of the assessment	+	-	±	+	-	+	+	+	±	±	±
4	Incomplete result data	+	±	+	+	±	+	+	±	±	+	+
5	Selective reporting	+	±	+	+	±	±	+	±	+	+	±
6	Other bias	+	+	+	+	+	+	+	+	+	+	±

Note: + = Low risk of bias, - = High risk of bias, ± Unclear risk of bias

and Effective Public Health Practice Project (EPHPP): Strong (rating 4 strong without weak), Moderate (4 strong one weak), Weak (2 or weaker) (Table 6). [39].

Table 6. Assessment of study quality EPHPP

No	Komponen EPHPP [39]	45	48	42	47	49	43	44	50	40	46	41
1	Selection Bias	1	1	1	1	2	1	1	1	2	1	1
2	Design	1	1	1	1	1	1	1	1	1	1	1
3	Confounder	1	1	1	1	2	1	1	2	2	1	1
4	Blinding	2	2	2	2	2	2	2	2	3	2	3
5	Method of collecting data	1	1	1	1	1	1	2	1	1	2	2
6	Withdrawals and Dropouts	1	1	1	1	1	1	1	1	2	1	1

Note: strong = 1 , Moderate = 2, Weak = 3

Results

Research design

In this systematic review, we reviewed eleven RCT articles that described the effects of TFU in permanent colostomy patients. Data for the whole participants (n = 2,424): five studies from China, four studies from Australia, one study from the England, and one study from Iran.

Risk of bias

This study's risk of bias assessment shows that the eleven articles have evidence level 1b and grade A recommendation (Table 5 and Table 6). All articles went through a randomized process; eight studies used single-blind, one study did not explain blindness [40], and one non-blind study [41]; however, there is one double-blind study [42]. This figure indicates a concern about the risk of bias. For study quality, nine studies have strong quality, and two studies have moderate quality.

Participants

The majority of studies reported patients with any stage of CRC who have undergone permanent colostomy surgery for the first time. The largest participants in a single study are 410 [43] and 775 participants [44]. The participant age ranged from 46 to 73 years [45]. Based on gender, most participants underwent permanent colostomy surgery and received treatment, including surgery, radiotherapy, and chemotherapy, were male (62 of 65 participants were male) (95.3%) [46]. Only one study that shows more female patients underwent colostomy surgery (46 of 70 participants were female) (65.7%) [40].

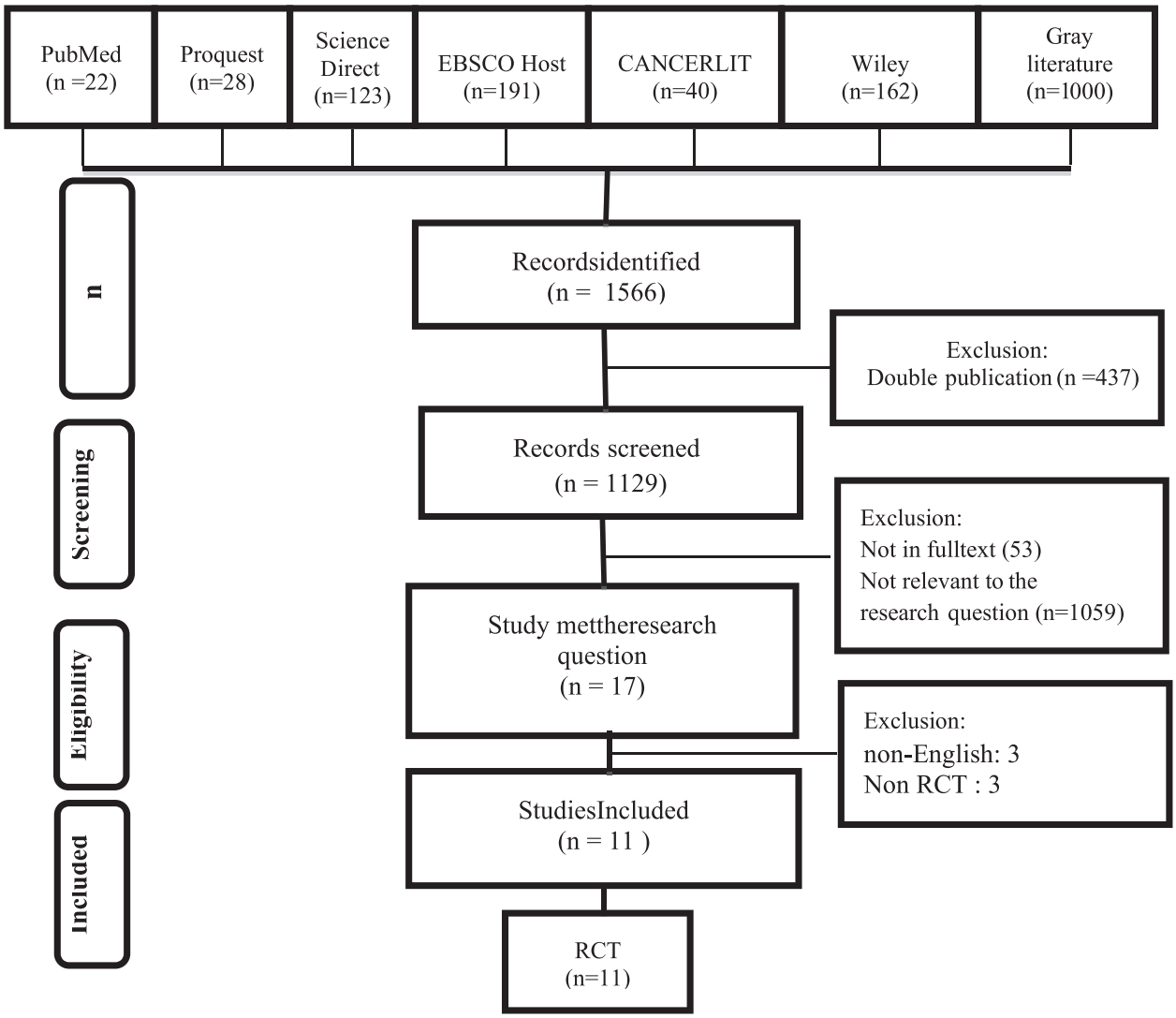

Fig. 1 *Flow charts for study selection and inclusion*

TFU Model and Duration

Two studies used a follow-up telephone in the CONNECT model in which participants received phone calls from ET nurses. Each standard call consisted of an unmet needs assessment and provision of information and emotional support [47],[44]. One study used a consultation model, in which participants received telephone consultations from an ET nurse, focused on providing information using a structured intervention [46]. In a study with telephone counseling, the main focus of counseling was on the client's knowledge and skills to change and install a colostomy [40]. One study by telephone intervention used the CanChange health coaching model in motivational interviews, problem-solving, action planning, goal setting, reviewing, and monitoring health behavior [43]. One study used a mobile app where participants received colostomy care from an ET nurse via a mobile app that shows photos and diagnoses, and consultation focused on colostomy problem solving and open communication [48]. One study used an information-based follow-up study: web, blog, QQ, and telephone [49]. One study used the Survivor Care (SC) model, consisted of educational material, needs assessment, survivorship care plan, final care session, and three TFU calls [41]. One study used TFU intervention by ET nurses to see if patients have any problems and provide protocol-compliant advice on assessment, management options, and evaluation [50]. One TTM-based intervention study provided continuing, and dynamic education consisted of face-to-face interviews at baseline, two days, 1 and 3 months after discharge [45]. Moreover, one study used the TiR Model, which was carried out in

three phases: WeChat, WeChat App, and TFU, which explained the focus of care, provided psychological support, and helped patients [42].

The duration of TFU varied across studies. Four studies used followed up at 1,3,6 months after hospital discharge; however, the length of time on-call was not specified. Other studies used following up at six months [45], 1, 3, and 6 months [48], two weeks for the next five months in the month 3,6,12 [43], then when I got home, three months and six months [42], in 6 months [47], week 1,3,7 then at month 2,6 [41], 1 and 3 months [49], 1, 3, and 6 months [44], 3 and 6 months [50], twice a week in the first month, and once a week in the second and third months, in which the time for each call was 15-30 minutes [40]. The shortest follow up was to 3-7 days, 14-20 days, 23-27 days [50]. The most extended follow-up started in the sixth week after discharge from the hospital, once every six months for two years and once a year in the third year. The call duration was 30 minutes consisted of 10 minutes for administration and 20 minutes for consultation [46].

Instrument

The instrument used in the included studies were the Likert scale self-efficacy [45], Stoma Self Efficacy Scale (SSES) [48], [49] for self-efficacy [50] Stoma-Quality of Life(Stoma-QO) [42], [49], [40], Functional Assessment of Cancer Therapy–Colorectal (FACT-C) [47] ; [44], HRQOL Short Form–36 [43], EORTC QLQ C-30 and EORTC QLQ CR-29 [41], and State-Trait Anxiety Inventory (STAI) [46] for QoL. For colostomy adjustments, the Ostomy Adjustment Inventory -23 (OIA-23) was used [50], [48], and for self-care, the Exercise of Self-care Agency Scale(ESCA) was used [42].

Effects of TFU on permanent colostomy patients

Self-Efficacy

Four studies investigated the effect of telephone follow-up on self-efficacy. In one study, participants received conventional care and transtheoretical model (TTM) interventions from trained ET nurses (*p = 0.05).* [45]. In the two studies, participants received routine care, and home cares mobile app intervention, increasing self-efficacy over time from 1 month ($p = 0.05$) [48] and higher self-efficacy at three months (*p = 0.001)* [49]. In another study, participants received routine care and telephone intervention by nurses achieved at three months ($p = 0.002$) [50]. These four studies reported that self-efficacy scores within the TFU group significantly increased over time from 1 month of the intervention compared to the control group.

Quality of Life

The effects of TFU on QoL assessed in the included studies were the physical, social, psychological, environmental, and health aspects of HRQOL. Seven studies show the effect of TFU on QoL: the provision of Timing It Right (TIR) intervention increases after 3 and 6 months ($p = 0.01$) [42], Administration of CONNECT QoL intervention increased at six months (5,7) as clinically relevant [47], increased all QoL dimensions after three months ($p = 0.05$) [49], giving telephone-delivered was significant on physical HRQOL at 6 and 12 months ($p = 0.072$) [43], receiving telephone counseling (telenursing) had a significant impact on physical, mental, social and general QoL ($p = 0.001$) [40], giving survivor care intervention had the same QoL in both groups [41]. Almost all of these studies measured a significant QoL effect in the intervention group. Only one study in the TFU CONNECT intervention that the QoL value was not significant ($p = 1.0$) [44].

Complications

After TFU administration, complications assessed include stoma narrowing, stoma prolapse, peristomal hernia, retraction, separation of the skin from the mucous membrane, or separation of the mutants. Four studies stated that the effect of TFU on complications was significant after three months (*p = 0.0001)* [49]. Low complications in the intervention group were necrosis and stenosis, a common complication was peristomal dermatitis from the control group (*p = 0.40)* [48], skin irritation, stoma retraction, and stomal stenosis, granuloma decreased 56, 9% (*p = 0.044)* [50], candida infection, urinary dermatitis ($p = 0.05$) [42]. This complication diagnosed by the ET nurse was measured by answering the questions "yes" and "no." The TFU group has a significantly lower incidence of complications compared to the control group.

Colostomy adjustments

Colostomy adjustment is measured subjectively on psychological and social aspects. Two studies

stated significant colostomy adjustment, i.e., sexual adjustment since three months (p = 0.049) [50], and colostomy adjustment increased over time starting at one month (p <0.001) [48]

Self-care dan self-management

The self-care ability of the intervention group improved significantly at six months ($p = 0.05$) [42], and self-management increased more in the intervention group after one month of follow-up ($p = 0.05$) [45]

Service satisfaction

Three studies found higher satisfaction levels in the intervention with TFU (p = 0.029) [46]. Most patients were satisfied with the follow-up care ($p = 0.0015$) [49]. A higher level of satisfaction was found in patients with post-treatment intervention compared to those receiving regular care (p = 0.05) [41], and satisfaction was much greater after three months of intervention (p = 0.0001) [50].

Discussion

The largest sample size in one study is 410 - 775 participants consisted of adult and elderly patients, aged between 46 - 73 years, and the majority of participants were male (95.3%). These figures are following the previous findings that the risk of CRC is significantly increased at the age of 40 years, where age is the most dramatic factor affecting CRC risk [51], while 90% of all diagnosed CRC is 50 years old and more male than female [2]. Nurses need to educate patients to follow the initial and regular screening at the age of 40 as screening every two years can prevent 1 in 6 deaths from CRC [52].

In this review, the TFU was performed by the ET nurse. The use of TFU varied from 1, 3, to 6 months, in which the shortest was 27 days, and the maximum was up to 3 years after the patient admission to the hospital. The significant result is measured after three months, with a maximum call time is for 30 minutes. This figure is different from previous studies where 68.42% of TFU interventions were mainly given at the beginning and maximum of six months after discharge from the hospital, and 31.5% were performed by nurses from the oncology team [53]. For this reason, nurses need to perform TFU on CRC patients with a permanent colostomy, at least three months, to achieve significant results.

The instrument most used to measure self-efficacy is the Stoma Self Efficacy Scale (SSES), while in measuring QoL, the Stoma-Quality of Life (Stoma-QO) is used frequently. This choice is consistent with Bekkers et al. 1996 in [54] that the SSES instrument is often used to measure colostomy patients' self-efficacy. Stoma-QO is an instrument used to measure QoL in patients with colostomy, while EORTC QLQ C-30 is an instrument to measure QoL in patients with cancer [55], [56]. However, to provide the most detailed information about colostomy patients' QoL problems, the Modified City of Hope Colorectal Cancer Quality of Life Questionnaire Ostomy (MCOHQOLQO) Questionnaire is used [5]. As a nurse, you should use the right instruments to measure the patient's self-efficacy and QoL so that problems related to self-efficacy and QoL can be identified in detail and can be given appropriate interventions.

The effect of TFU on permanent colostomy patients after undergoing treatment is evident in self-efficacy, QoL, and complications. Patient self-efficacy and QoL increased better, while the incidence rate of complications was lower after TFU administration. The common complication is peristomal dermatitis. Besides, TFU also improves self-care, self-management, colostomy adjustments, and satisfaction levels from time to time for one month. Previous studies showed that the overall QoL and complication incidence of patients with a permanent colostomy is affected up to 81.1% [5], [57]. However, this figure can be reduced by education, emotional support, and a TFU program provided by the ET nurse to maintain or even increase the QoL of patients with a permanent colostomy [14], [57]. A similar finding revealed that telephone consultation could affect 42.1% on patient satisfaction, 26.3% on QoL, 21% on self-efficacy [53], and provide a suitable alternative to consultation and reduce an estimated 39% practical workload [58]. So, it is recommended to the ET nurse to provide consultation via TFU to patients with a permanent colostomy after patient treatment in the hospital or post-discharge.

Implications

Patients with permanent colostomy have different nursing care needs at different stages of the disease, and they change dynamically. The TFU intervention reduces consultation time in the hospital and saves costs. It is recommended to provide TFU given by nurses to CRC patients with a permanent colostomy for further care at home.

Conclusion

This systematic review has summarized the best available evidence regarding the effect of administering TFU by ET nurses on permanent colostomy patients to be effective in improving QoL, self-efficacy, and complications. For this reason, an effective TFU is recommended for at least three months to improve self-efficacy, all dimensions of QoL, satisfaction with care, and complications. In this review, eight studies used a single-blind intervention design; patients were aware of the given intervention; studies were involved in the adult population; one study performed TFU under three months, and the TFU required specifically trained nurses. Further research is needed on TFU interventions, including frequency, call duration, and scheduled calls.

Conflict interests

The author states that there is no conflict of interest.

Funding

The author states that they do not have a source of funding.

Ethical clearance

No ethical clearance was required for this systematic review article.

Author's contribution

All authors contributed to the writing of this systematic review article.

References

1. Sommers, Marilyn Sawyer A. Davis's diseases and disorders : a nursing therapeutics manual / Marilyn Sawyer Sommers. Sixth edit. Philadelphia : F. A. Davis Company; 2019. 1233 p.
2. Lewis, S.i, Dirksen.S.R, Heltkemper, M.M, Bucher L. Medical-surgical nursing: Assesment and managemement of clinical problems [Internet]. 2014. 1830 p. Available from: elsevier:Mosby
3. Kemenkes RI. Situasi Penyakit Kanker. *J Chem Inf Model*. 2015;**53**:160.
4. Susanty S, Rangki L. Changes and adaptation patient post colostomy. *Iosr Jnhs*. 2016;**5**(6):123-9.
5. Vonk-Klaassen SM, de Vocht HM, den Ouden MEM, Eddes EH, Schuurmans MJ. Ostomy-related problems and their impact on quality of life of colorectal cancer ostomates: a systematic review. *Qual Life Res.* 2016;**25**(1):125-33. https://doi.org/10.1007/s11136-015-1050-3
6. Anaraki F, Vafaie M, Behboo R, Maghsoodi N, Esmaeilpour S, Safaee A. Clinical profile and post-operative lifestyle changes in cancer and non-cancer patients with ostomy. *Gastroenterol Hepatol from Bed to Bench.* 2012;**5(**SUPPL. 1):26-30.
7. Lim SH, Chan SWC, Chow A, Zhu L, Lai JH, He HG. Pilot trial of a STOMA psychosocial intervention programme for colorectal cancer patients with stomas. *J Adv Nurs.* 2019;**75**(6):1338-46. https://doi.org/10.1111/jan.13973
8. Salvadalena GD. The incidence of stoma and peristomal complications during the first 3 months after ostomy creation. *J Wound, Ostomy Cont Nurs*. 2013;**40**(4):400-6. https://doi.org/10.1097/WON.0b013e318295a12b
9. Krishnamurty DM, Blatnik J, Mutch M. Stoma Complications. *Clin Colon Rectal Surg*. 2017;**30**(3):193-200. https://doi.org/10.1055/s-0037-1598160
10. Murken DR, Bleier JIS. Ostomy-Related Complications. *Clin Colon Rectal Surg*. 2019;**32:**176-82. https://doi.org/10.1055/s-0038-1676995
11. Lindholm E, Persson E, Carlsson E, Hallén AM, Fingren J, Berndtsson I. Ostomy-related complications after emergent abdominal surgery a 2-year follow-up study. *J Wound, Ostomy Cont Nurs.* 2013;**40**(6):603-10. https://doi.org/10.1097/WON.0b013e3182a9a7d9
12. Irwan AM, Balabagno AO. Factors related to self-care among older persons of Makassarese Tribe, Indonesia. *Philipp J Nurs*. 2014;**84**(2):24-30.
13. Davenport R. A proven pathway for stoma care: The value of stoma care services. *Br J Nurs.* 2014;**23(**22):1174-80. https://doi.org/10.12968/bjon.2014.23.22.1174
14. A Prospective, Longitudinal, Multicenter, Cohort Quality-of-Life Evaluation of an Intensive Follow-up Program for Patients with a Stoma. *Ostomy Wound Manag*. 2010;**56**(5):44-52.

15. Beaver K, Latif S, Williamson S, Procter D, Sheridan J, Heath J, et al. An exploratory study of the follow-up care needs of patients treated for colorectal cancer. *J Clin Nurs*. 2010;**19**(23-24):3291-300. https://doi.org/10.1111/j.1365-2702.2010.03407.x

16. Faury S, Koleck M, Foucaud J, M'Bailara K, Quintard B. Patient education interventions for colorectal cancer patients with stoma: A systematic review. *Patient Educ Couns* [Internet]. 2017;**100**(10):1807-19. Available from: http://dx.doi.org/10.1016/j.pec.2017.05.034 https://doi.org/10.1016/j.pec.2017.05.034

17. L. Sheng, M. Christopher AM. A Chronic Care Ostomy Self-Management Program for Cancer Survivors. *Psychooncology.* 2016;**176**(1):100-106.

18. Altuntas YE, Kement M, Gezen C, Eker HH, Aydin H, Sahin F, et al. The role of group education on quality of life in patients with a stoma. *Eur J Cancer Care (Engl).* 2012;**21**(6):776-81. https://doi.org/10.1111/j.1365-2354.2012.01360.x

19. Danielsen AK, Burcharth J, Rosenberg J. Patient education has a positive effect in patients with a stoma: A systematic review. *Color Dis.* 2013;**15**(6):276-84. https://doi.org/10.1111/codi.12197

20. Sharifi H, Zeydi EA. The challenges of technology-based self-care in chronic diseases: An issue deserving further attention. *Bangladesh J Med Sci*. 2018;**17**(01):178-9. https://doi.org/10.3329/bjms.v17i1.35304

21. 21. Cox K, Wilson E. Follow-up for people with cancer: Nurse-led services and telephone interventions. *J Adv Nurs.* 2003;**43**(1):51-61. https://doi.org/10.1046/j.1365-2648.2003.02672.x

22. Burch J, Taylor C. Follow-Up After Enhanced Recovery. *Gastrointest Nurs.* 2012;**10**(4):51-8. https://doi.org/10.12968/gasn.2012.10.4.51

23. Badiyepeymaiejahromi , Z Ramezanli, S Farzaneh, M Torabizadeh C. Quality of Communication skills of nurses worked at the Hospitals Affiliated to Jahrom University of Medical Sciences, Iran. *Bangladesh J Med Sci.* 2018;**17**(02):275-81. https://doi.org/10.3329/bjms.v17i2.35884

24. Mistiaen P, Poot E. Telephone follow-up, initiated by a hospital-based health professional, for postdischarge problems in patients discharged from hospital to home. *Cochrane Database Syst Rev*. 2010;(1):124.

25. Woods CE, Jones R, O'Shea E, Grist E, Wiggers J, Usher K. Nurse-led postdischarge telephone follow-up calls: A mixed study systematic review. *J Clin Nurs*. 2019;**28**(19-20):3386-99. https://doi.org/10.1111/jocn.14951

26. Dickinson R, Hall S, Sinclair JE, Bond C, Murchie P. Using technology to deliver cancer follow-up: A systematic review. *BMC Cancer*. 2014;**14**(1). https://doi.org/10.1186/1471-2407-14-311

27. Zhou M, Holden L, Bedard G, Zeng L, Lam H, Chu D, et al. The utilization of telephone follow-up in the advanced cancer population: A review of the literature. *J Comp Eff Res*. 2012;**1**(6):509-17. https://doi.org/10.2217/cer.12.63

28. Liptrott S, Bee P, Lovell K. Acceptability of telephone support as perceived by patients with cancer: A systematic review. *Eur J Cancer Care (Engl).* 2018;**27**(1):1-28. https://doi.org/10.1111/ecc.12643

29. Burch J. Post-discharge care for patients following stoma formation: what the nurse needs to know. *Nurs Stand.* 2017;**31**(51):41-5. https://doi.org/10.7748/ns.2017.e10198

30. Cusack M, Taylor C. A literature review of the potential of telephone follow-up in colorectal cancer. *J Clin Nurs.* 2010;**19(**17-18):2394-405. https://doi.org/10.1111/j.1365-2702.2010.03253.x

31. Williamson S, Chalmers K, Beaver K. Patient experiences of nurse-led telephone follow-up following treatment for colorectal cancer. *Eur J Oncol Nurs [*Internet]. 2015;**19**(3):237-43. Available from: http://dx.doi.org/10.1016/j.ejon.2014.11.006 https://doi.org/10.1016/j.ejon.2014.11.006

32. Kabisch M, Ruckes C, Seibert-Grafe M, Blettner M. Randomized Controlled Trials. *Dtsch Arztebl.* 2011;**108**(39):663-8. https://doi.org/10.3238/arztebl.2011.0663

33. Moher D, Liberati A, Tetzlaff J, Altman DG, Antes G, Atkins D, et al. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. Rev Esp Nutr Humana y Diet. 2014;18(3):172-81. https://doi.org/10.14306/renhyd.18.3.114

34. Brandt Eriksen M, Faber Frandsen T. The impact of patient, intervention, comparison, outcome (PICO) as a search strategy tool on literature search quality: a systematic review. *J Med Libr Assoc* [Internet]. 2018;**106(**4):420-31. Available from: https://jmla.pitt.edu/ojs/jmla/article/view/345/726 https://doi.org/10.5195/JMLA.2018.345

35. Polit, Denise F., Beck CT. Essentials of nursing research : appraising evidence for nursing practice / Denise F. Polit, Cheryl Tatano Beck. 2018. 1-625 p.

36. Critical Appraisal Skills Programme. Critical Appraisal Skill Program CASP Randomized Controled Trial Cheklist. CASP. 2018;

37. Centre for Evidence-Based Medicine (CEBM). Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence. Vol. 3. 2011. p. 1-3.

38. Higgins JPT, Altman DG, Gotzsche PC, Juni P, Moher D, Oxman AD, et al. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *Bmj.* 2011**;(343):**1-9. https://doi.org/10.1136/bmj.d5928

39. Thomas BH, Ciliska D, Dobbins M, Micucci S. A process for systematically reviewing the literature: Providing the research evidence for public health nursing interventions. *Worldviews Evidence-Based Nurs.* 2004;**1**(3):176-84. https://doi.org/10.1111/j.1524-475X.2004.04006.x

40. Parchami Iraqi M, Ahmadi Z. Effect of Telephone Counseling (Telenursing) on the Quality of Life of Patients with Colostomy. *J Client-centered Nurs Care*. 2016;**2**(2):123-30. https://doi.org/10.32598/jccnc.2.2.123

41. Jefford M, Gough K, Drosdowsky A, Russell L, Aranda S, Butow P, et al. A Randomized Controlled Trial of a Nurse-Led Supportive Care Package (SurvivorCare) for Survivors of Colorectal Cancer. *Oncologist.* 2016;**21**(8):1014-23. https://doi.org/10.1634/theoncologist.2015-0533

42. Zhang X, Gao R, Lin JL, Chen N, Lin Q, Huang GF, et al. Effects of hospital-family holistic care model on the health outcome of patients with permanent enterostomy based on the theory of 'Timing It Right.' J Clin *Nurs*. 2020; https://doi.org/10.1111/jocn.15199

43. Hawkes AL, Chambers SK, Pakenham KI, Patrao TA, Baade PD, Lynch BM, et al. Effects of a telephone-delivered multiple health behavior change intervention (CanChange) on health and behavioral outcomes in survivors of colorectal cancer: A randomized controlled trial. *J Clin Oncol*. 2013;**31**(18):2313-21. https://doi.org/10.1200/JCO.2012.45.5873

44. Young JM, Butow PN, Walsh J, Durcinoska I, Dobbins TA, Rodwell L, et al. Multicenter randomized trial of centralized nurse-led telephone-based care coordination to improve outcomes after surgical resection for colorectal cancer: The CONNECT intervention. *J Clin Oncol*. 2013;**31**(28):3585-91. https://doi.org/10.1200/JCO.2012.48.1036

45. Wen SL, Li J, Wang AN, Lv MM, Li HY, Lu YF, et al. Effects of transtheoretical model-based intervention on the self-management of patients with an ostomy: A randomised controlled trial. *Journal of Clinical Nursing* 2019;Vol. **28:** 1936-1951 p. https://doi.org/10.1111/jocn.14731

46. Beaver K, Campbell M, Williamson S, Procter D, Sheridan J, Heath J, et al. An exploratory randomized controlled trial comparing telephone and hospital follow-up after treatment for colorectal cancer. *Color Dis.* 2012;**14(**10):1201-9. https://doi.org/10.1111/j.1463-1318.2012.02936.x

47. Harrison JD, Hons BS, Ph D. Randomized Pilot Evaluation of the Supportive Care Intervention " CONNECT " for People Following Surgery for Colorectal Cancer. *Dis Colon Rectum*. 2011**;54**(5):622-31. https://doi.org/10.1007/DCR.0b013e31820bc152

48. Wang QQ, Zhao J, Huo XR, Wu L, Yang LF, Li JY, et al. Effects of a home care mobile app on the outcomes of discharged patients with a stoma: A randomised controlled trial. *Journal of Clinical Nursing.* 2018; Vol. **27**: 3592-3602 p. https://doi.org/10.1111/jocn.14515

49. Xia L. The Effects of Continuous Care Model of Information-Based Hospital-Family Integration on Colostomy Patients: a Randomized Controlled Trial. *J Cancer Educ*. 2020;**35**(2):301-11. https://doi.org/10.1007/s13187-018-1465-y

50. Zhang JE, Wong FKY, You LM, Zheng MC, Li Q, Zhang BY, et al. Effects of enterostomal nurse telephone follow-up on postoperative adjustment of discharged colostomy patients. *Cancer Nurs.* 2013**;36**(6):419-28. https://doi.org/10.1097/NCC.0b013e31826fc8eb

51. Wong MC, Ding H, Wang J, Chan PS, Huang J. Prevalence and risk factors of colorectal cancer in Asia. *Intest Res*. 2019;**17(**3):317-29. https://doi.org/10.5217/ir.2019.00021

52. Drennan V, Goodman C. Oxford Handbook of Primary care and community nursing. Second. United Kingdom: Oxford University Press; 2014. 1-847 p. https://doi.org/10.1093/med/9780199653720.003.0001

53. Moretto IG, Contim CLV, Santo FH do E. Telephone follow up as a nursing intervention for patients receiving outpatient chemotherapy: integrative review. *Rev Gauch Enferm*. 2019;**40**:e20190039. https://doi.org/10.1590/1983-1447.2019.20190039

54. Wu HKM, Chau JPC, Twinn S. Self-efficacy and quality of life among stoma patients in Hong Kong. *Cancer Nurs.* 2007;**30**(3):186-93. https://doi.org/10.1097/01.NCC.0000270704.34296.86

55. Li J, Xiao X, Wei Y, Li Y, Zou M, Yu S, et al. Investigation of quality of life in patients with lung cancer by the EORTC QLQ-C30 (V3 . 0) Chinese version *. *Oncol Transl Med*. 2015;**1**(3):125-9.

56. Zhang Z, Wang A. Effect of Self-efficacy Intervention on Quality of Life of Patients With Intestinal Stoma. *Gastroenterol Nurs*. 2018;**41**(4):341-6.

57. White L, Duncan G, Baumle W. Medical-Surgical Nursing : An Integrated Approach. Vol. 53, Journal of Chemical Information and Modeling. 2013. 1689-1699 p. https://doi.org/10.1021/ci400128m

58. Downes MJ, Mervin MC, Byrnes JM, Scuffham PA. Telephone consultations for general practice: A systematic review. *Syst Rev.* 2017;**6**(1):1-6. https://doi.org/10.1186/s13643-017-0529-0