

Effect of Information-Motivation-Behavioral Skills Model-Based Intervention on Quality of Life of Ostomy Patients

Stomalı Bireylere Uygulanan Bilgi, Motivasyon, Davranış Becerileri Modeli (IMB Modeli) Rehberliğindeki Müdahalenin Yaşam Kalitesi Üzerine Etkisi

¹Tuba YILMAZER^a, ²Hilal TUZER^a, ³Simay AKYÜZ^b

^aAnkara Yıldırım Beyazıt University Faculty of Health Sciences, Department of Nursing, Ankara, TURKEY

^bAnkara Gülhane Training and Research Hospital, Ankara, TURKEY

ABSTRACT Objective: The aim of this study was to assess the effect of the Information-Motivation-Behavioral Skills model on the quality of life of ostomy patients. **Material and Methods:** This was a prospective randomized controlled clinical trial. This study was conducted between May 2018 and August 2019 in the general surgery clinic of a training and research hospital. The study sample consisted of 60 patients 18 years of age or older who had a temporary/permanent colostomy and ileostomy to be closed in more than 6 months. Patients were randomized into two groups; intervention (n=30) and control (n=30). In this study, data were obtained by using a Demographic Characteristics Questionnaire, Information Assessment Test (pretest- posttest) (Information), the Behavior Assessment Form (Behavior Skills) and the 36-Item Short Form Survey Quality of Life Scale (SF-36QoLS). The intervention group participants were trained by a general surgery nurse about the information stages of the model and received either telephone or face-to-face counseling during the first and third months as part of the motivation stage. Their ostomy care behavior was evaluated as part of the behavioral skills stage at the end of the sixth month. The control group received no intervention. The quality of life in both groups was assessed at the end of the sixth month. **Results:** The intervention group had a higher mean SF-36 behavior evaluation score than the control group before and after the intervention (p <0.001). Although there was an increase in the median information assessment test scores of both intervention and control groups, that in the former was statistically significantly higher than that in the latter (p <0.001). **Conclusion:** The Information Motivation-Behavioral Skills model had an effect on the quality of life of ostomy patients.

ÖZET Amaç: Araştırma Bilgi, Motivasyon, Davranış Becerileri Modeli'nin stomalı hastalarda yaşam kalitesi üzerindeki etkisini incelemek amacıyla yapılmıştır. **Gereç ve Yöntemler:** Araştırma prospektif, randomize kontrollü klinik bir çalışmadır. Araştırma Mayıs 2018-Agustos 2019 tarihleri arasında bir eğitim ve araştırma hastanesinin genel cerrahi kliniğine başvuran toplam 60 hasta ile gerçekleştirildi. 18 yaş üstü, 6 aydan daha uzun sürede kapatılacak geçici/kalıcı kolostomi ve ileostomi olan hastalar araştırmaya dahil edildi. Hastalar müdahale grubu (n=30) ve kontrol grubu (n=30) olarak iki eşit gruba randomize edildi. Bu çalışmada Demografik Özellikler Formu, Bilgi Değerlendirme Testi (ön test-son test) (Bilgi), Davranış Değerlendirme Formu (Davranış Becerileri) ve Kısa-Form 36 Yaşam Kalitesi Ölçeği (SF36YKO) kullanılarak veriler elde edildi. Müdahale grubuna genel cerrahi hemşiresi tarafından modelin bilgi basamağı kapsamında eğitim verildi; motivasyon basamağı kapsamında 1. ve 3. aylarda telefonla veya yüzyüze görüşülerek danışmanlık hizmeti verildi; davranış becerileri basamağı kapsamında 6. ayın sonunda stoma bakımına yönelik davranışları değerlendirildi. Kontrol grubuna ise bu model uygulanmadı. Altıncı ayın sonunda her iki grubun da yaşam kalitesi değerlendirildi. **Bulgular:** Uygulama öncesi ve sonrası müdahale grubunda kontrol grubuna göre SF-36, davranış değerlendirme puan ortalamalarının anlamlı düzeyde arttığı saptandı (p<0,001). Her iki grubun bilgi puanlarında artış olmakla beraber, müdahale grubundaki artış anlamlıydı ve kontrol grubuna göre daha fazlaydı (p<0,001). **Sonuç:** Bilgi, Motivasyon, Davranış Becerileri Modeli'nin stomalı hastalarda yaşam kalitesi üzerinde etkili olduğu bulundu.

Keywords: Ostomy; models; nursing; quality of life

Anahtar Kelimeler: Stoma; modeller; hemşirelik; yaşam kalitesi

Correspondence: Tuba YILMAZER

Ankara Yıldırım Beyazıt University Faculty of Health Sciences, Department of Nursing, Ankara, TURKEY/TÜRKİYE

E-mail: tyilmazer@ybu.edu.tr



Peer review under responsibility of Türkiye Klinikleri Journal of Nursing Sciences.

Received: 30 Oct 2019

Received in revised form: 16 Jan 2020

Accepted: 03 Feb 2020

Available online: 05 Feb 2020

2146-8893 / Copyright © 2020 by Türkiye Klinikleri. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Nowadays, people are faced with numerous health problems due to increased life expectancy and an increase in cancer cases and trauma and chronic degenerative disorders. As a consequence, patients undergo ostomy surgery, which causes significant changes in their anatomy and bodily functions.¹ However, inadequate preoperative patient preparation causes patients to have difficulty adapting to their newly formed ostomys and caring for them, which adversely affects their quality of life.²⁻⁴

The World Health Organization (WHO) defines quality of life in five dimensions; physical health, mental health, independence, social and environmental issues.^{5,6} Ostomy-related complications (skin and adaptive problems, leakage etc.) cause patients to experience negative emotions such as isolation from family and society, which affects their physical, cognitive, emotional and social functions and reduces their quality of life.^{2,3,5,7} Improving the quality of life of ostomy patients is of paramount importance, and therefore, they should be perceived by healthcare professionals as a priority target group.^{5,8}

As important members of the healthcare team, nurses care for and train ostomy patients, identify potential complications, improve their quality of life and help them to adjust to living with an ostomy.^{5,9-11} Patients need training on many aspects (changing a colostomy bag, skin care around the ostomy, diet and activity restrictions, etc.) to adapt to living with an ostomy. Training should focus on motivating patients to get used to living with an ostomy and on helping them to develop ostomy care behavioral skills.^{5,12}

The training is designed to promote changes in health behavior in ostomy patients. The Information-Motivation-Behavioral Skills (IMB) model is used to identify positive changes in health behavior in various patient populations.¹³⁻¹⁷ The IMB model employs the basic concepts of knowledge, motivation, and behavioral skills to help to account for and assess the development, implementation and sustainability of changes in health behavior. Information refers to information on changes in health behavior. Motivation refers to beliefs or attitudes that change or sustain health behavior. Behavioral skills refer to objective health behavior skills and the sense of self-efficacy

needed to develop those skills.^{13,18} We, therefore, believe that a comprehensive IBM-based training program will help ostomy patients develop the components of the model, and thereby improve their quality of life. However, to our knowledge, no studies have been conducted so far to assess the effect of the IMB model on the quality of life of ostomy patients.

MATERIAL AND METHODS

RESEARCH DESIGN

This was a prospective randomized controlled clinical trial assessing the effect of the IMB model on the quality of life of ostomy patients.

SETTING AND PARTICIPANTS

This study was conducted between May 2018 and August 2019 in the general surgery clinic of a training and research hospital in Ankara/Turkey. The initial study sample consisted of 62 patients 18 years of age or older who were to undergo ostomy surgery. However, two patients (one patient in control group, one patient in intervention group) could not complete the study and were therefore excluded from the analysis. The hospital had a wound care and ostomy nursing unit, which however focused more on wound care than ostomy care. The intervention of interest was delivered by the researcher nurse (general surgery) of the clinic.

INCLUSION/EXCLUSION CRITERIA

The study inclusion criteria were being (1) 18 years of age or older, (2) literate and (3) volunteer, and (4) having a temporary/permanent colostomy and ileostomy to be closed in more than 6 months

The exclusion criteria were having (1) a temporary/permanent colostomy and ileostomy to be closed in less than 6 months and (2) a mental or psychological disorder.

SAMPLE SIZE AND RANDOMIZATION

Participants were randomized into two groups using a computer-based block randomization method. Randomization continued until the target sample size was achieved ($n = 30$ for each intervention and control group).¹⁹ In the sample calculation of this study, the

study of Sabin et al. (2010) was used and 30 people in each group were found to be sufficient.¹⁹ Patients and researchers were not blinded to intervention assignment by the design of the study.

In the sample calculation of this study, the study of Sabin et al. (2010) was used and 30 people in each group were found to be sufficient.¹⁹

DATA COLLECTION TOOLS

Data were collected using a Demographic Characteristics Questionnaire developed by the researchers based on literature review, and the Information Assessment Test (pretest-posttest) (Information), the Behavior Assessment Form (Behavior Skills) and the 36-Item Short Form Survey Quality of Life Scale (SF-36QoLS).

The demographic characteristics questionnaire (Form 1) consists of 7 items on socio-demographic characteristics (age, gender, marital status, education level, staying with, comorbidities, ostomy type).^{9,20}

The Information Assessment Test (IAT) (pretest- posttest) (Form 2) was developed by the researchers based on literature review.^{21,22} This form consists of 35 multiple-choice questions eliciting information on what ostomy is, ostomy characteristics, ostomy care, emptying and changing an ostomy bag, challenges of living with an ostomy, ostomy skin care, feeding, gas and odor problem, traveling, pregnancy and colostomy irrigation etc.^{21,22} The final form was scrutinized by seven specialists (two wound, ostomy, and continence nurses and five surgical nurses). The total scale score ranges from 0 to 100, with higher scores indicating more information about the issue. All participants completed the IAT one day before surgery and three months after discharge.

The Behavior Assessment Form (BAF) (Form 3) was developed to evaluate ostomy care skills by the researchers based on literature review.^{21,22} It consists of 20 items scored on a scale of 0 to 3 (0=Not observed; 1=Missing/Incorrect; 2=Correct/Accurate).^{21,22} The final form was scrutinized by seven specialists (two wound, ostomy, and continence nurses and five surgical nurses). This specialists evaluated this form on a 4-point Likert scale, (1= not relevant/appropriate, 2=unable to assess relevance without revision, 3 = relevant but needed minor

alterations, and 4 = very relevant and appropriate). The content validity index of this form was found to be 1. The total scale score ranges from 0 to 40. Skill score is calculated by converting the total score to a 100-point scale. The researcher completed the scale by observing all participants performing ostomy care six months after they were discharged.

The 36-Item Short Form Survey Quality of Life Scale (SF-36QoLS) (Form 4) is a self-assessment scale developed by Rand Corporation (1992) to assess quality of life.²³ The SF-36 measures eight subscales; physical functioning (10 items), role physical (4 items), bodily pain (2 items), general health (5 items), vitality (4 items), social functioning (2 items), role emotional (3 items) and mental health (5 items). Most items are scored on a Likert-type scale taking the last 4 weeks into account. The total subscale score ranges from 0 (poor health condition) to 100 (good health condition). The validity and reliability of the Turkish version of the SF-36 were established by Koçyiğit et al. (1999). Cronbach's alpha of the tool ranged from 0.7324 to 0.7612.²⁴ In this study, the Cronbach alpha of the tool was 0.71. The scale was administered six months after participants were discharged.

The Handbook of Living with an Ostomy addressed such issues as what ostomy is and how to live with it, its causes and complications and possible challenges, ostomy care, and changing an ostomy bag.^{21,22} It was created by the researchers by examining the current literature.^{21,22} The final handbook was scrutinized by seven specialists (two wound, ostomy, and continence nurses and five surgical nurses).

INTERVENTION

In the study, the participants hospitalized in the same clinic were randomly divided into two groups as control group (n= 30 participants) and intervention group (n: 30 participants).

Information: All participants completed the demographic characteristics questionnaire and the IAT (pretest) one day before surgery. After surgery (post-op, days 1-2), the intervention group participants were trained, at their convenience, for 40 minutes by the researcher using lecture, demonstration, Q&A session and discussion methods. Training was pro-

vided by a single clinical nurse. The handbook was distributed to them during training. All participants completed the IAT (posttest) again when they visited the hospital for routine examination 3 months after discharge.

The control group participants received routine ostomy care (including changing the colostomy bag) from their family members and nurses and were trained by the company staff after surgery. They consulted the company staff about their post-discharge problems. The handbook was distributed to them at the end of the study as well.

Motivation: The intervention group participants were given positive behavioral feedback to motivate them to get used to living with in ostomy and to encourage them to perform ostomy care. The researcher provided them with postoperative ostomy care. They were also given discharge training to explain the issues they did not understand before discharge. They were provided with either telephone or face-to-face counseling by the researcher during the first and third months. Their general health condition was asked, and counseling services continued for those in need. In this way, they were motivated to live with a ostomy. No evaluation form was used at this stage.

Behavioral Skills: The researcher used the BAF and SF-36QoLS to assess participants' ostomy care performance and quality of life, respectively, six months after discharge. When the literature is examined, it is seen that the change in behavior is evaluated after 3 and 6 months.^{16,17} In this study, the evaluation was made 6 months later.

STATISTICAL ANALYSIS

The distributions of continuous variables were examined by Shapiro-Wilk test and normality plots. All continuous and discrete variables were reported as median (min-max), while categorical variables were shown by frequency (%).

The study and control groups were compared by Mann-Whitney U test and Chi-square tests with respect to the demographical characteristics. Yates' chi-square test was applied for 2x2 tables. Pearson chi-square test and likelihood ratio test were performed for rxc tables if the proportion of the cells

having an expected frequency less than 5 is <%25 and between %25 and %50, respectively. Knowledge scores were compared by F1-LD-F1 design to reveal the effect of group and time interaction, and education, itself. SF-36 scale scores of the groups were compared by Mann-Whitney U test. A p-value<0.05 was considered statistically significant.

F1-LD-F1 design was performed by "nparLD" package via R language. All other statistical analyses were performed via IBM SPSS Statistics 22.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.)

ETHICAL CONSIDERATIONS

The study was approved by the Ethics Committee of the University of Health Sciences (18/09). Written permission was obtained from the head physician of Gulhane Training and Research Hospital as well as from participants. The study was carried out in accordance with the Helsinki Declaration Principles.

RESULTS

The mean age of the intervention group was 54.87±9.89 years and that of the control group was 59.10±10.36. Forty-six point seven percent (n=14) of both groups were male. Both groups were similar in terms of demographic characteristics (p>0.05, [Table 1](#)).

The intervention group had a median pre- and post-intervention IAT score of 41.43 (min: 22.86; max: 65.71) and 54.29 (min: 18.57; max: 94.29), respectively, while the control group had a median pre- and post-test IAT score of 41.43 (min: 20.00; max: 68.57) and 45.71 (min: 17.14; max: 82.86), respectively ([Table 2](#)). Although there was an increase in the IAT scores of both intervention and control groups, that in the former was statistically significantly higher than that in the latter (p<0.001). Besides, the increase of the score in the intervention group was significantly higher than the one in the control group (group* time interaction p-value <0.001). When the BAF score was examined, it was found that there was a significant increase in the intervention group compared to the control group (p<0.001).

TABLE 1: Demographic characteristics (n=60).

Characteristics	Intervention (n=30) Mean±SD n (%)	Control (n=30) Mean±SD n (%)	p
Age (years)	54.87±9.89	59.10±10.36	0.111
Gender (male)	14 (46.7)	14 (46.7)	1.000
Marital status (married)	22 (73.3)	21 (70.0)	1.000
Education level			0.422
Primary education	17 (56.7)	21 (70.0)	
High school and above	13 (43.3)	9 (30.0)	
Staying with			–
Spouse	13 (43.3)	11 (36.7)	
Children	0 (0.0)	8 (26.7)	
Others*	17 (56.7)	11 (36.6)	
Comorbidities	20 (66.7)	17 (56.7)	0.453
Hypertension	10 (50.0)	7 (41.2)	
Insulin-dependent diabetes	9 (45.0)	7 (41.2)	
Others**	1 (5.0)	3 (17.6)	
Type of ostomy			–
Temporary Colostomy	20 (66.7)	13 (43.3)	
Permanent Colostomy	6 (20.0)	11 (36.7)	
Temporary Ileostomy	3 (10.0)	5 (16.7)	
Permanent Ileostomy	1 (3.3)	1 (3.3)	

Student t test was used for age. Chi-square tests were used for categorical variables.

- Since the proportion of the cells which have an expected frequency less than 5 is >50%, the statistical test results cannot be given.

*Including mother, siblings, and alone/own self.

**Including kidney failure, heart disease

The intervention group had significantly higher scores on the “physical functioning,” “role emotional” “vitality,” “mental health,” “social functioning” and “general health” subscales of the SF-36 than the control group ($p < 0.001$) (Table 2, Figure 1).

DISCUSSION

Ostomy patients need training for self-care, management of complications and high quality of life.^{5,9,10} The objective of the training is to help ostomy patients to develop health behaviors and to improve their quality of life. The IMB model results in positive changes in health behaviors and improves quality of life.¹³⁻¹⁷

There was an increase in the median IAT scores of both intervention and control groups. However, the increase in the median IAT score of the former was statistically significantly higher than that in the latter. There are no studies on the effect of the IMB model on ostomy patients. However, studies on dif-

ferent patient groups have reported that the IMB model is effective.^{13,15,16} The integration of knowledge and motivation (the first two components of the IMB model) is expected to result in changes in health behaviors (the third component).

There was a statistically significant increase in the BAF scores of the intervention group compared to the control group. Some studies found that the IBM model resulted in changes in health behaviors while some others reported that it affected only the information and motivation components but did not result in behavior change.²⁵⁻³⁰ Our results suggest that informing ostomy patients and motivating them in the first and third months might result in changes in health behaviors.

The intervention group had significantly higher scores on the “physical functioning,” “role emotional” “vitality,” “mental health,” “social functioning” and “general health” subscales of the SF-36 than the control group.

TABLE 2: Comparison of IAT, BAF and SF-36 Scores (n=60).			
	Intervention (n=30)	Control (n=30)	p ²
	Median (min-max) n (%)	Median (min-max) n (%)	
Knowledge scores			
Pretest	41.43 (22.86-65.71)	41.43 (20.00-68.57)	0.756
Posttest	54.29 (18.57-94.29)	45.71 (17.14-82.86)	0.005
P ¹	<0.001	0.083	
Behavioural skills scores	79.0 (68-95)	70.0 (60-90)	<0.001
Short form SF-36 scala scores			
Physical function	80 (0-100)	50 (35-90)	<0.001
Physical role	100 (0-100)	25 (0-100)	0.003
Emotional role	100 (0-100)	33.3 (0-100)	<0.001
Vitality	52.5 (35-80)	35 (20-70)	<0.001
Mental health	64 (44-80)	40 (24-68)	<0.001
Social function	50 (37.5-87.5)	12.5 (0-75)	<0.001
Pain	77.5 (10-100)	48.8 (10-90)	0.007
General health perception	57.5 (30-75)	30 (15-70)	<0.001

¹Results for the time effect within each group obtained from F1-LD-F1 results. ² Results of Mann-Whitney U test and Chi-square tests for metric and qualitative variables, respectively.

IAT: The Information Assessment Test, BAF: Behavior Assessment Form, SF-36: The 36-Item Short Form Survey Quality of Life Scale.

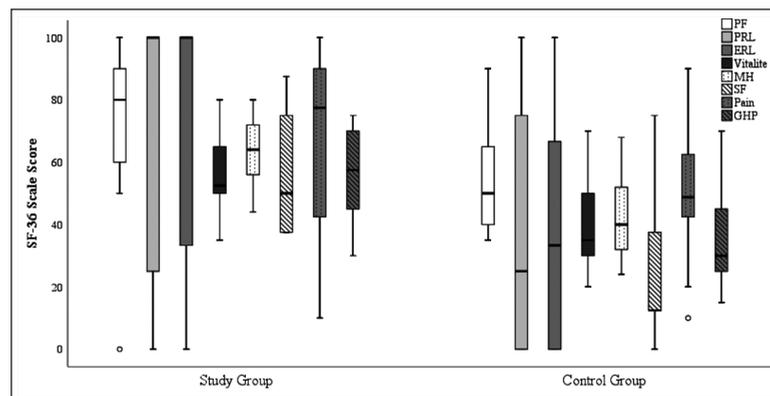


FIGURE 1: Distribution of SF-36 quality of life scale scores.

According to the IMB model, knowledge and motivation are important for skill development. Even informed and optimistic patients have difficulty developing behavioral skills.¹³ Our intervention group participants were more informed and motivated than the control group participants, and therefore, they had better ostomy care skills. The improvement in their knowledge, motivation and behavioral skills also improved their quality of life. There are no studies investigating the effect of the IMB model-based ostomy care training on quality of life. However, some studies on conventional os-

tomy care training reported that it improved the quality of life of the patients.^{9,30} Coca et al. reported that a patient group cared for and trained by an ostomy nurse had higher quality of life scores at the end of the third month than another patient group cared for and trained by a nurse who was not specialized in ostomy.⁹ Lim et al. trained their intervention group on the day of discharge and followed them up over the phone and evaluated the data in the first and third months. They concluded that the quality of life of the intervention group increased compared to the control group.³⁰

LIMITATIONS

The study has three limitations. First, it was conducted in only one center. Second, the sample size is too small to represent the whole population of ostomy patients. Third, the IMB-model-based intervention was performed by a clinical nurse, not by an ostomy and wound care nurse. We believe that if an ostomy and wound care nurse had performed that intervention, we would have had better results.

CONCLUSION

The IMB-model-based intervention improved the ostomy patients' information level, behavioral skills and quality of life. It is recommended that further multicenter studies with larger sample sizes be conducted to analyze the effect of different aspects of the IMB model on ostomy patients.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct con-

nection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Tuba Yilmazer, Hilal Tuzer; **Design:** Tuba Yilmazer, Hilal Tuzer; **Control/Supervision:** Tuba Yilmazer, Hilal Tuzer; **Data Collection and/or Processing:** Simay Akyüz, Tuba Yilmazer, Hilal Tuzer; **Analysis and/or Interpretation:** Tuba Yilmazer, Hilal Tuzer; **Literature Review:** Tuba Yilmazer; **Writing the Article:** Tuba Yilmazer, Hilal Tuzer; **Critical Review:** Tuba Yilmazer, Hilal Tuzer; **References and Fundings:** Tuba Yilmazer, Hilal Tuzer; **Materials:** Tuba Yilmazer, Hilal Tuzer, Simay Akyüz.

REFERENCES

- Salome GM, De Almeida SA, Mendes B, De Carvalho MRF, Junior MRM. Assessment of subjective well-being and quality of life in patients with intestinal ostomy. *J Coloproctol (Rio J)*. 2015;35(3):168-74. [[Crossref](#)]
- Lim SH, Chan SWC, Lai JH, He HG. A qualitative evaluation of the OSTOMY psychosocial intervention programme for colorectal cancer patients with ostomy. *J Adv Nurs*. 2019;75(1):108-18. [[Crossref](#)] [[PubMed](#)]
- Xu S, Zhang Z, Wang A, Zhu J, Tang H, Zhu X. Effect of self-efficacy intervention on quality of life of patients with intestinal ostomy. *Gastroenterol Nurs*. 2018;41(4):341-6. [[PubMed](#)]
- Notter J, Chalmers F. Living with a colostomy: a pilot study. *Gastrointestinal Nursing* 2012;10:16-24. [[Crossref](#)]
- Ziba FN, Kanani S. To investigate the impact of family-centered education on the quality of life of patient with ostomy. *J Evolution Med Dent Sci*. 2018;7(41):5215-9. [[Crossref](#)]
- Taylor C. Reach for recovery: evaluating a pilot study of a colorectal cancer survivorship programme. *Eur J Oncol Nurs*. 2013;17(2):131-7. [[Crossref](#)] [[PubMed](#)]
- Dalmolin A, Girardon-Perlini NMO, Coppetti LC, Rossato GC, Gomes JS, Nunes da Silva ME. Educational video as a healthcare education resource for people with colostomy and their families. *Rev Gaucha Enferm*. 2016;37(Spe):e68373. [[Crossref](#)] [[PubMed](#)]
- Golicki M, Styczen P, Szczepkowski M. Quality of life in patients with Ostomy in Poland: multicentre cross-sectional study using WHOQOL-BREF questionnaire. *Value Health Reg Issues* 2013;16(7):A421. [[Crossref](#)]
- Coca C, Larrinoa IF, Serrano R, García-Llana H. The impact of specialty practicenursing care on health-related quality of life in persons with ostomies. *J Wound Ostomy Continence Nurs*. 2015;42(3):257-63. [[Crossref](#)] [[PubMed](#)]
- Dabirian A, Yaghmaee F, Rasouli M. Ostomy patient's quality of life: a qualitative study. *Iran J Nurs Res*. 2011;6(20):75-82.
- Sarabi N, Nasiri-Ziba F, Safarabadi-Farahani T, Hosseini AF. A survey of ostomy patient satisfaction with nursing care. *IJN*. 2011;24(69):43-52.
- Zand S, Asgari P, Bahramnezhad F, Rafiei F. The effect of two educational methods (family-centered and patient-centered) multimedia software on dysrhythmia of patients after acute myocardial infarction. *J Health*. 2016;7(1):7-17.
- Chang TY, Zhang YL, Shan Y, Liu SS, Song XY, Li ZY, et al. A study on the information-motivation-behavioural skills model among Chinese adults with peritoneal dialysis. *J Clin Nurs*. 2018;27(9-10):1884-90. [[Crossref](#)] [[PubMed](#)]
- Lee G, Yang, SY, Chee YK. Assessment of healthy behaviors for metabolic syndrome among Korean adults: a modified information-motivation-behavioral skills with psychological distress. *BMC Public Health*. 2016;16:518. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Osborn CY, Egede LE. Validation of an information-motivation-behavioral skills model of diabetes self-care (IMB-DSC). *Patient Educ Couns*. 2010;79(1):49-54. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
- Zarani F, Besharat MA, Sarami G, Sadeghian S. An information-motivation-behavioral skills (IMB) model-based intervention for CABG patients. *Int J Behav Med*. 2012;19(4):543-9. [[Crossref](#)] [[PubMed](#)]
- Ybarra ML, Korchmaros JD, Prescott TL, Birungi R. A randomized controlled trial to increase HIV preventive information, motivation, and behavioral skills in Ugandan adolescents. *Ann Behav Med*. 2015;49(3):473-85. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]

18. Fisher JD, Fisher WA. Changing AIDS-risk behavior. *Psychol Bull.* 1992;111(3):455-74. [[Crossref](#)] [[PubMed](#)]
19. Sabin LL, DeSilva MB, Hamer DH, Xu K, Zhang J, Li T, et al. Using electronic drug monitor feedback to improve adherence to antiretroviral therapy among HIV-positive patients in China. *AIDS Behav.* 2010;14(3):580-9. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
20. Colwell JC, Pittman J, Raizman R, Salvadarena G. A randomized controlled trial determining variances in ostomy skin conditions and the economic impact (ADVOCATE Trial). *J Wound Ostomy Continence Nurs.* 2018;45(1):37-42. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
21. ASCN Ostomy Care Clinical Guidelines 2016. p.55. [cited 2017 Jan 8]. Available from: <http://ascnuk.com/wp-content/uploads/2016/03/ASCN-Clinical-Guidelines-Final-25-April-compressed-11-10-38.pdf>.
22. Tuzer H, Elbas N. Determining the information level devoted to ostomy care of patients with abdominal ostomy. *Robotics, Lap and Endo Surg.* 2016;2:1-5.
23. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care.* 1992;30(6):473-83. [[Crossref](#)] [[PubMed](#)]
24. Koçyiğit H, Aydemir Ö, Ölmez N, Fişek G, Memiş A. [Reliability and validity of the Turkish version of short form-36 (SF-36)]. *Ege Fizik Tedavi ve Rehabilitasyon Dergisi.* 1999;12:102-6.
25. Kiene SM, Fisher WA, Shuper PA, Cornman DH, Christie S, MacDonald S, et al. Understanding HIV transmission risk behavior among HIV infected south Africans receiving antiretroviral therapy: an information--motivation--behavioral skills model analysis. *Health Psychol.* 2013;32(8):860-8. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
26. Ndebele M, Kasese-Hara M, Greyling M. Application of the information, motivation and behavioural skills model for targeting HIV risk behaviour amongst adolescent learners in South Africa. *SAHARA J.* 2012;9 Supp 1:S37-47. [[Crossref](#)] [[PubMed](#)]
27. Malow RM, Dévieux JG, Stein JA, Rosenberg R, Lerner BG, Attonito J, et al. Neurological function, information-motivation-behavioral skills factors, and risk behaviors among HIV-positive alcohol users. *AIDS Behav.* 2012;16(8):2297-308. [[Crossref](#)] [[PubMed](#)]
28. Kudo Y. Effectiveness of a condom use educational program developed on the basis of the information-motivation-behavioral skills model. *Jpn J Nurs Sci.* 2013;10(1):24-40. [[Crossref](#)] [[PubMed](#)]
29. Konkle-Parker DJ, Amico KR, McKinney VE. Effects of an intervention addressing information, motivation, and behavioral skills on HIV care adherence in a southern clinic cohort. *AIDS Care.* 2014;26(6):674-83. [[Crossref](#)] [[PubMed](#)] [[PMC](#)]
30. Lim SH, Chan SWC, Lai JH. A randomized controlled trial examining the effectiveness of aostomy psychosocial intervention programme on the outcomes of colorectal patients with a ostomy: study protocol. *J Adv Nurs.* 2015;71(6):1310-23. [[Crossref](#)] [[PubMed](#)]