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Riba Haobam
Tata Medical Center, New Town Kolkata, West Bengal, India

A study to assess the effect of using one-piece versus two-piece ostomy appliances on self-maintenance of stoma care among cancer patients with ostomy in selected hospital of Kolkata, West Bengal

Riba Haobam

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Abstract
Ostomy is a surgical procedure performed when normal bladder or bowel function is lost. The types of ostomy procedures include colostomy, ileostomy, and urostomy. Patient needs to be attatched with an ostomy bag for receiving the waste collected. There are two main types of ostomy bags which are one-piece ostomy appliances and two-piece ostomy appliances. Proper handling, care and maintenance of these appliances are important for every person with ostomy.

A study was conducted to assess the effect of using one-piece versus two-piece ostomy appliances on self-maintenance of stoma care among cancer patients with ostomy in selected hospital of Kolkata. The aim of the study was to find out and compare self-maintenance abilities of stoma care among cancer patients with stoma using one-piece and two-piece stoma appliances. Study was done by Descriptive survey design. Eighty samples were selected with 40 in each group through non probability purposive sampling technique from Tata Medical Center, Kolkata and Ostomy Association of West Bengal, Kolkata. Data were collected by interview method. Findings of the study showed that one-piece stoma appliance users, majority 32 (80%) of had moderate self-maintenance ability. 37 (93%) two-piece stoma appliance users had moderate self-maintenance ability. There was significant association between self-maintenance of stoma care with demographic variables of the teaching on stoma care and sources of information of stoma care for one-piece ostomy appliance users. There was significant association between self-maintenance of stoma care with duration of using stoma appliances among two-piece ostomy appliance users.

Keywords: Ostomy patients, self-maintenance of stoma care

Introduction
An ostomy (or stoma) is a surgical opening made in the skin as a way for the waste products to leave the body. A colostomy is a surgically-created opening of the large intestine through the abdomen. Colostomy is of four types according to their location. Proper handling, care and maintenance of these appliances are important for every person with ostomy. Self-maintenance of ostomy appliances are crucial for patient with ostomy. Patients are taught and educated by specially trained stoma nurse regarding the ostomy and its maintenance on their own. Stoma nurse also should care, evaluate the patients ability for performing to do a proper self-care of the stoma as it is a big challenge to live with a stoma for all ostomates.

The main fear of patients with ostomy is the leaking of the stoma.In turn this may also lead to peristomal skin irritation, which is not only uncomfortable but, in time, may also impact on the fit and security of the ostomy appliance. A study was conducted by Radha Acharya Pandey *et al*. ''A study to assess the practice of stoma care among ostomates at B.P. Koirala Memorial Cancer Hospital, Nepal in September 2015. A total of 94 ostomates who met eligible criteria were purposively sampled. A Majority 92.6 percentage respondents had good daily care practice. A Majority 89.4 percentage of the ostomates suffered from physical problems. Of which 72.3 percentage had peristomal skin irritation, 64.9 percentage had leakage and odour [1].

Colorectal cancer is the third most commonly diagnosed cancer in males and the second in females, with more than 1.4 million new cancer cases every year. In India, the annual incidence rates for colon cancer and rectal cancer in men are 4.4 and 4.1 per 100000, respectively. The annual incidence rate for colon cancer in women is 3.9 per 100000.

Corresponding Author:
Riba Haobam
Tata Medical Center, New Town Kolkata, West Bengal, India

In India, according to the recent reports of the National Cancer Registry Programme, the overall incidence rate of the urinary bladder cancer is 2.25% (per 100, 000 annually): 3.67% among males and 0.83% for females [27].

The adverse impacts of any stoma on patients are physical, psychological and social. The most common physical problems with stoma are leaking, peristomal skin problems, the need for adaptation of stoma appliances and the need for adaptation of clothing to the presence and site of the stoma which has a significant impact on patients daily life. It is generally understood that a negative impact of stoma can affect self-care practices and may result in inappropriate and costly use of supplies [20].

The application of one-piece and two-piece bags among the patients has a variety of convenience and effectiveness on the basis of advantages. In one-piece bag the wafer (the part which sticks on the skin) is fused to pouch right of the box. It gives a lower profile and costs less. In case of two-piece bag, the wafer and pouch are separate. There is better option of sticking the wafer to the skin before applying a pouch, which means that it can have a better look of stoma and that usually results in achieving a better fit and is convenient in handling and managing.

At Tata Medical Centre, Kolkata 10 -15 cases of ostomy surgery are done every month, out of which 70 - 80 percentage are colostomy and illeostomy surgery and remaining are urostomy surgery. Around 150-180 patients attend OPD and stoma clinic every month for bag changing and bag related problem. Immediately after operation, patients are given the one-piece bag and at the time of discharge they are given two-piece bag. The one-piece bag need to be change after every 3 - 4 days and two-piece bags require changing after 7 days. As Kolkata is a humid place there is high chances that the plaster attached with the skin might get peeled off and cause leakage of the bag, which is usually seen in one-piece bag. In two-piece bag the belt helps in securing the bag and prevent leakage. In stoma clinic most common problems expressed by ostomates are leakage of bag, odour, skin irritation, problems while wearing outfits like saree etc.

The researcher felt the need to see the effectiveness of the one-piece and two-piece bags among the ostomy patients to know their convenience and self-maintenance of the stoma care. So, the researcher has planned to conduct a comparative study to assess the effectiveness of one-piece versus two-piece ostomy appliances on self-maintenance of stoma care among cancer patients with with ostomy.

Materials and Methods
This study was conducted in view of accomplishing the objectives of assessing the effect of self-maintenance on stoma care of patient with one-piece and two-piece ostomy appliances among cancer patients with ostomy in selected hospital of Kolkata, West Bengal''.

Quantitative non experimental approach was used in this study.

Descriptive survey design is the research design of the present study. It is a research design in which researcher investigates a group of people.

Tata medical center and Ostomy association of West Bengal, Kolkata was chosen for conducting the research study. Tata Medical Center is an oncology super speciality hospital. The Hospital has a capacity of 437 beds and serves all sections of the society.

The population selected for this study were all stoma patients.

In this study, the samples were patients who had colostomy, ileostomy, and urostomy.

Eighty patients were selected for final study from those attending out patient department of Tata Medical Center, Kolkata and Ostomy association of West Bengal, Kolkata. According to the type of appliances used, the 80 patients were are divided into two groups

1. **Group 1:** Patient with one-piece ostomy bag-40 patients.
2. **Group 2:** Patient with two-piece ostomy bag-40 patients.

Non probability,purposive sampling technique was used to select the sample for this study since the selection of samples largely depend upon their availability. Patients were selected as per the inclusion criteria.

Data collection tool used for the present research study is structured questionnaires and interview techniques were used to collect the information from the patient.

The tools were developed after extensive review of literature of relevant topics.

Tool I: Demographic Proforma
The purpose of demographic data was to collect the background information of the patient included in the study, the items were selected on some of the important basic parameters of the patient. Structured Interview Schedule was used for demographic data to collect the background of the patients which included 9 items. In this tool closed ended items were Gender, age, education level, occupation,types of stoma, duration of using stoma appliances, teaching on stoma care, sources of information for stoma care of Ostomy Patients to obtain Demogrpahic Variables.

Tool II: Structured self-report questionnaire is developed to assess the effect of self-maintenance of stoma care of patient with one-piece and two-piece ostomy appliances. The tool consist of 18 questions measured by 4 points likert scale with a lowest score of 0 and highest score of 3. This tool was used to elicit the responses from the respondents ranging from never,rarely,sometimes and often in ascending order of 0, 1, 2, 3. Total score ranging from 0 to 54. Highest score -54, Lowest score: 0

Scoring key was prepared as follows
Self-maintenance ability of Ostomates
1. High self-maintenance ability: 0 -18
2. Moderate self-maintenance ability: 19 -36
3. Low/Less self-maintenance ability: 37 - 54

The tool was given to five experts who are specialists in the fields of medical surgical nursing, pediatric nursing, Gastroenterology oncologist, Urologist for validity of tool.

The proposal was approved by member of Board of studies, West Bengal University of Health Sciences, Kolkata on 11/03/2019.

The proposal was ethically accepted by the Institutional Review Board (IRB) on 27/06/2019.

Informed consent was obtained from the patients who met the inclusion criteria.

Formal permission was taken from institutional Review Board (IRB) committee, the concerned consultants, Gastro-intestinal Department, Urologist department, Nursing Superintendent, Tata Medical Center, Kolkata.

Data collection was done from 30-12-2019 to 01-02-2020.
- Patients are taken from Tata Medical Center OPD and from ostomy association Kolkata if less patients are available in the OPD.
- Approximatey 2-3 patients were taken per day.
- Data were collected from each patient by interview method.

Results and Discussions
Organization and Presentation of Study Findings
The data collected was tabulated, categorized, analysed and interpreted using descriptive and inferential statistics. The data have been presented under the following sections -
- **Section I:** Demographic data for determining sample characteristics.
- **Section II:** This section describes the findings related to the self-maintenance of one-piece and two-piece ostomy appliance users.
- **Section III:** Findings related to the comparison of the

self-maintenance of one-piece and two-piece ostomy appliance users.
- **Section IV:** Findings related to association of self-maintenance of one-piece and two-piece ostomy appliance users with the selected demographic variables.
- Section V: Findings related to association of self-maintenance of one-piece ostomy appliance users with the selected demographic variables

Section I: Demographic data for determining sample characteristics
This section deals with the findings related to the demographic variables of patients with one-piece and two-piece ostomy appliance and interpreted through graphical representation. The sample consist of 40 one-piece ostomy appliance users and 40 two-piece ostomy appliance users.
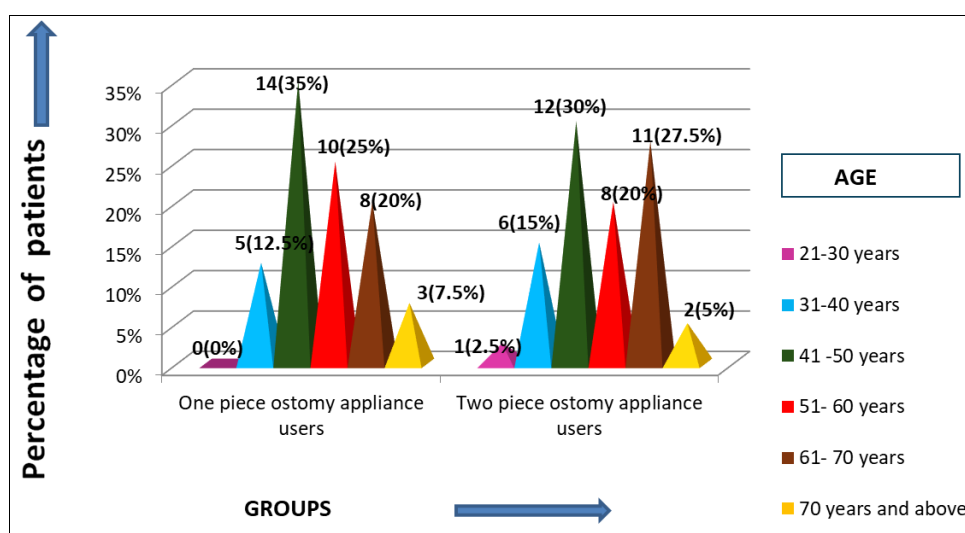

Fig 1: Cone diagram representing the distribution of patients with one-piece and two-piece ostomy appliance users according to their age. n=40+40

Data depicted in cone diagram of figure 3 represent that 35% (14) patients using one-piece ostomy appliances was within 41-50 years of age and 30% (12) of two-piece ostomy appliance users belong the same group.
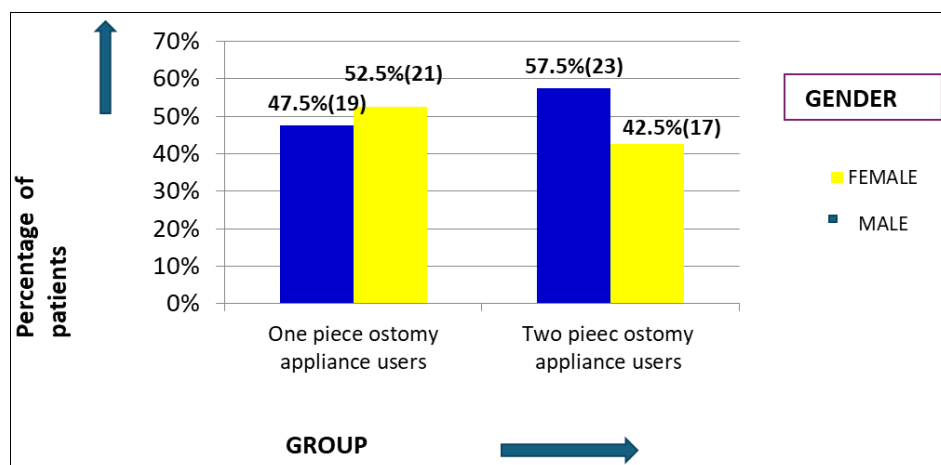

Fig 4: Bar diagram representing the distribution of one-piece and two-piece ostomy appliance users according to their gender. n=40+40

Data depicted in bar diagram of figure 4 represent that 47.5% (19) were male and 52.5% (21) patients were female and among the one-piece ostomy appliance users. In the two-piece ostomy appliance users 57.5% (23) were male and 42.5% (17) were female.
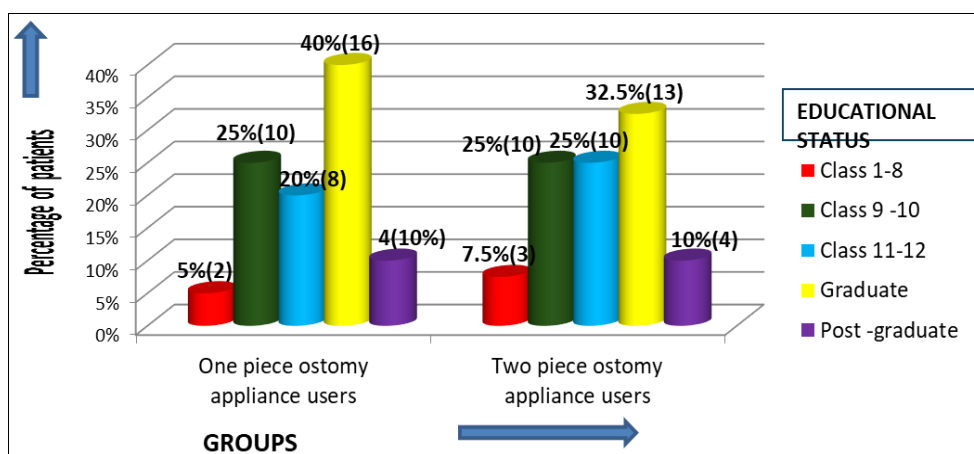
Fig 5: Cylindrical diagram representing the distribution of one-piece and two-piece ostomy appliance users according to their education level. n=40+40

Data depicted in cylindrical diagram of figure 5 represented 40% (16) was graduate among the one-piece ostomy appliance users and 32.5% (13) were graduates among the two-piece ostomy appliance users. This indicates that most of sample of both groups are graduate.
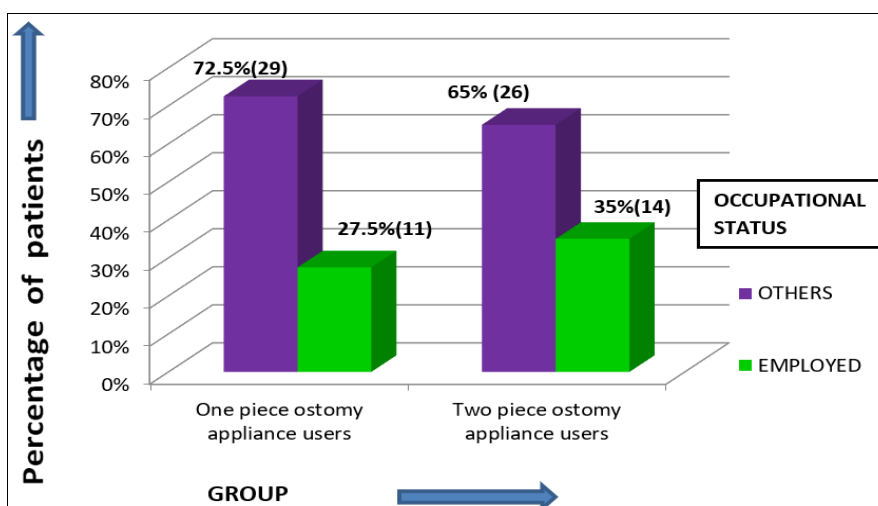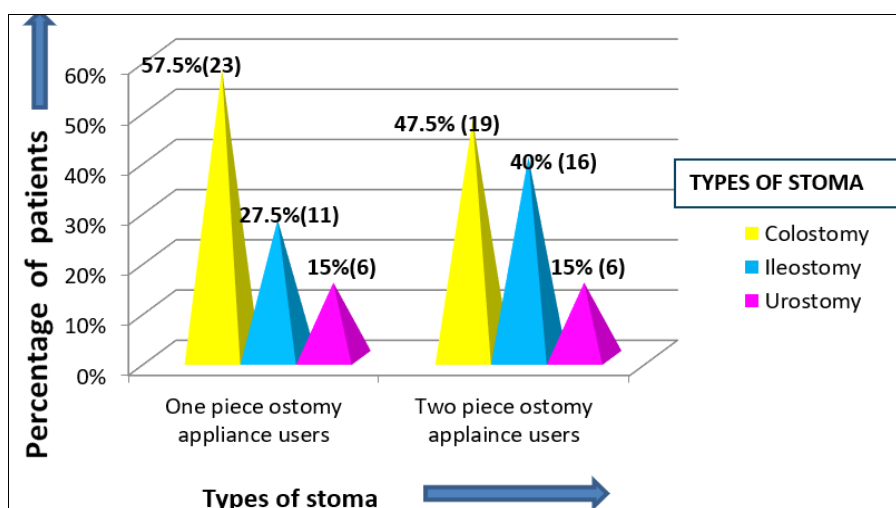

Fig 6: Bar diagram representing the distribution of one-piece and two-piece ostomy appliance users according to their occupation status. n=40+40

Data depicted in bar diagram of figure 6 represented that 72.5% (29) patients belong to the others category among the one-piece ostomy appliance users and 27.5% (11) are employed.Whereas among the two-piece ostomy appliance users and 65% (26) belong to the others group and 35% (14) were employed.

Fig 7: Cone diagram representing the distribution of one-piece and two-piece ostomy appliance users according to types of stoma. n=40+40

Data depicted in cone diagram of figure 7 represented that 57.5% (23) one-piece ostomy appliance users and 47.5% (19) two-piece ostomy appliance users had colostomy. 27.5% (11) one-piece ostomy appliance users and 40% (16) two-piece ostomy appliance users had ileostomy. 15% (6) had urostomy in both the one-piece and two-piece ostomy appliance users.
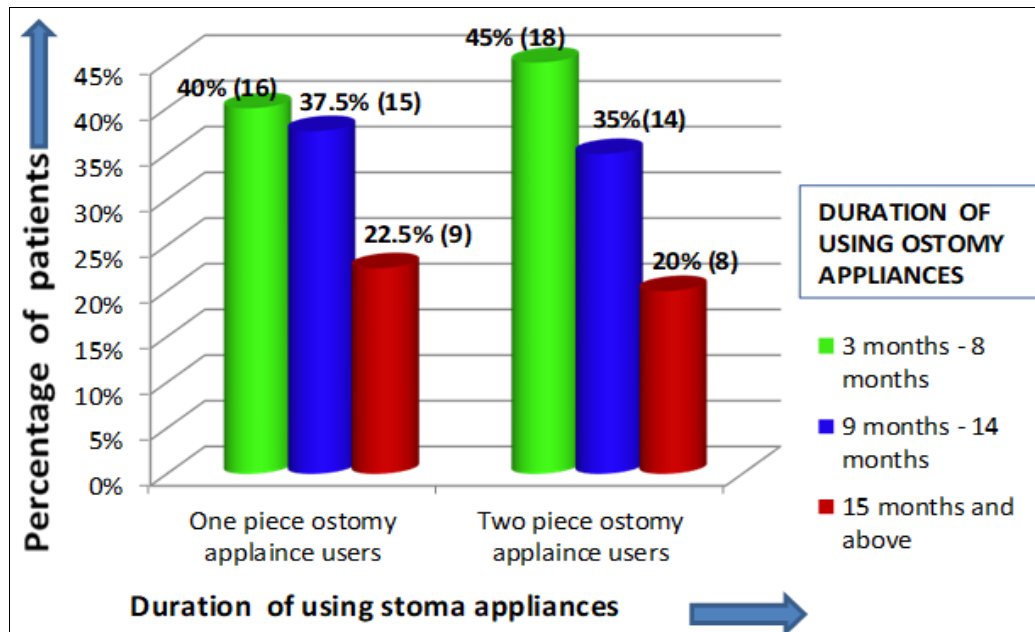

Fig 8: Cylindrical diagram representing the distribution of one-piece and two-piece ostomy appliance users according to the duration of using ostomy appliances. n=40+40

Data depicted in cone diagram of figure 8 represented duration of using stoma appliances by 40% (16) one-piece ostomy appliance users and 45% (18) two-piece ostomy appliance users is 3-8 months. Duration of using stoma appliances by 37.5% (15) one-piece ostomy appliance users and 35% (14) two-piece ostomy appliance users is 9 months - 14 months. And duration of using stoma appliances by 22.5% (9) one-piece ostomy appliance users and 20% (8) two-piece ostomy appliance users is 15 months and above.
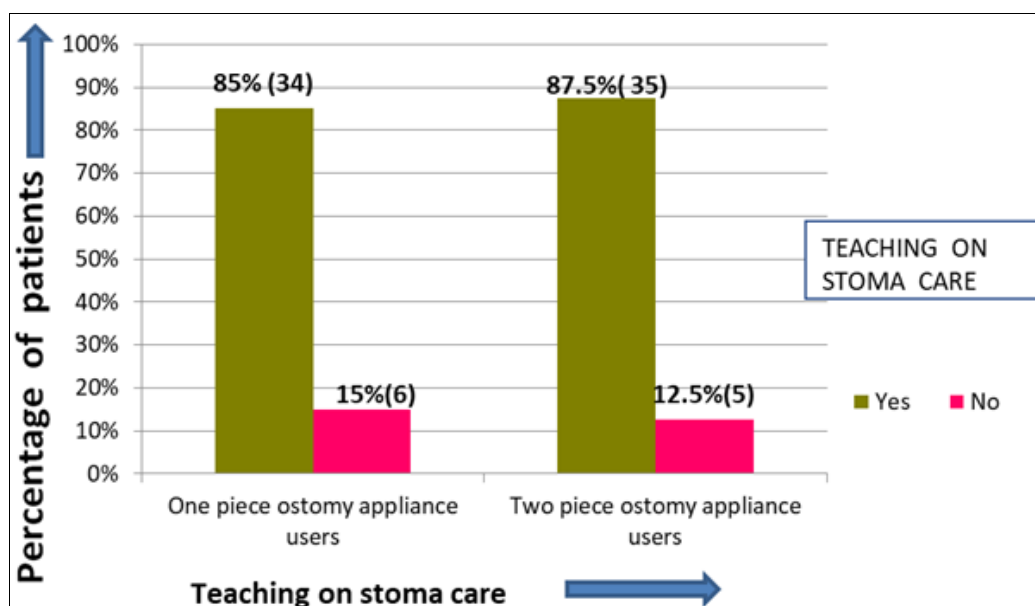

Fig 9: Bar diagram representing the distribution of one-piece and two-piece ostomy appliance users according to teaching on stoma care. n=40+40

Data depicted in bar diagram of figure 9 represented that 85% (34) one-piece ostomy appliance patients received teaching on stoma care whereas it is 87.5% (35) in case of two-piece ostomy appliance users who received teaching on stoma care.
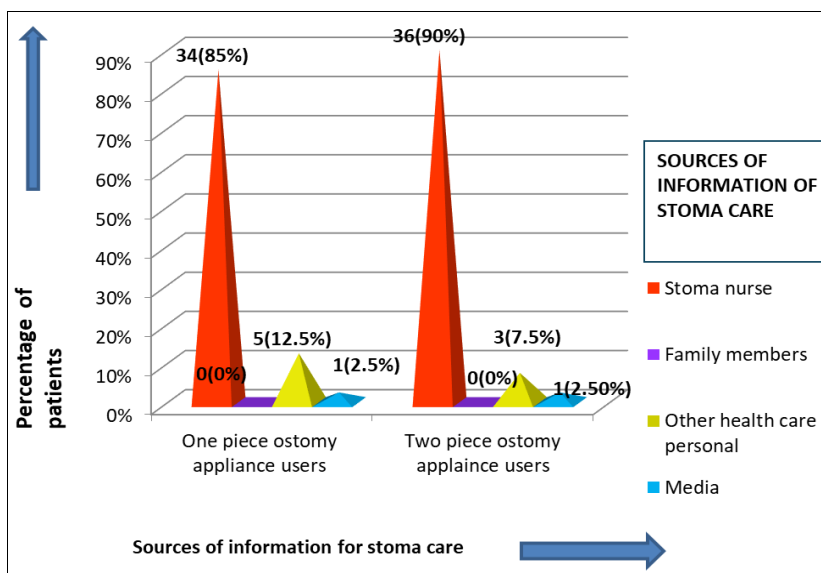
Fig 10: Cone diagram representing the distribution of one-piece and two-piece ostomy appliance users according to teaching on sources of information for stoma care. n=40+40

Data depicted in bar diagram of figure 10 represented 34 (85%) of one-piece ostomy appliance users received information from stoma nurse whereas 90%(36) in two-piece ostomy appliance users received information for stoma care from stoma nurse. 5 (12.5%) of one-piece ostomy appliance users patients received teaching on stoma care from other health care personal whereas for two-piece ostomy appliance users it was 3 (7.5%) received teaching on stoma care from other health care personal. Only 1(2.5%) of one-piece and two-piece ostomy appliance users received teaching on stoma care from media.

Section II: Graphical representation of the self-maintenance score of one-piece and two-piece ostomy appliance users.
This section deals with the findings related to the self-maintenance of patients with one-piece and two-piece ostomy appliance users through structured self report questionnaire. The tool consist of 18 questions measured by 4 points likert scale with a lowest score of 0 and highest score of 3.
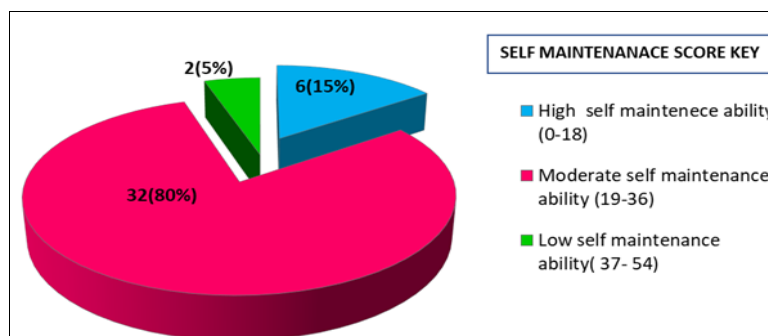

Fig 11: Pie diagram showing the frequency and percentage of the self-maintenance ability of one-piece stoma appliance users. n = 40

Data depicted in the above pie diagram 11 represents that majority 80% (32) cancer patients with stoma using one-piece ostomy appliance are moderately able to perform self - maintenance, 6(15%) had high self-maintenance ability, and 5% (2) had low self-maintenance ability among one-piece stoma appliances.
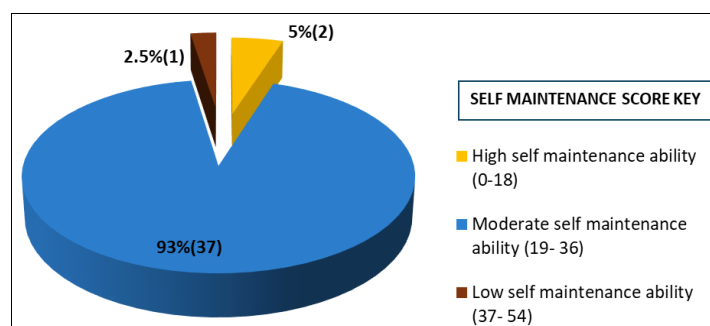

Fig 12: Pie diagram showing the frequency and percentage of self-maintenance ability of two-piece stoma appliances users. n=40

Data depicted in the above pie diagram 12 represents that majority 93% (37) cancer patients with stoma using two-piece ostomy appliance are moderately able to perform self - maintenance, 5% (2) had high self-maintenance ability, and 2.5% (1) had low self-maintenance ability among two-piece ostomy appliance users.

Section III: Findings related to the comparison of self-maintenance between one-piece and two-piece ostomy appliance users.

This section deals with the findings related to the comparison of one-piece and two-piece ostomy appliance users on self-maintenance by structured self report questionnaire by using the unpaired 't' test formula to find out the significance of the data.

Table 1: Mean,median, standard deviation, standard error and 't' test on self-maintenance between one-piece and two-piece ostomy appliance. (n= 40 + 40)

Sl. no	Type of appliance	Mean	Median	Standard Deviation	Standard Error	Unpaired 't' test
1.	One-piece ostomy appliance users	30.45	30	5.50	1.21	2.64
2.	Two-piece ostomy appliance users	27.25	27			

Unpaired t (78) = 2.306; p=0.05, df = 78

Table 1 represented the mean value of one-piece ostomy appliance users is 30.45, and the mean value of two-piece ostomy appliance users is 27.25, standard deviation is 5.50 and standard error is 1.21.

Calculated unpaired 't' test value at t_{78} was 2.64 which was greater than the table value t_{78}= 2.306, at p=0.05 level of significance.

The result indicates that the significant difference is not by chance a true difference present in the self-maintenance on stoma care between one-piece and two-piece ostomy appliances users among the ostomy patient at 0.05 level of significance.

Therefore the null hypothesis is rejected and research hypothesis is accepted.

Section IV: Findings related to association of self-maintenance of one-piece and two-piece ostomy appliance users with the selected demographic variables.

This section presents the findings on the associations between self-maintenance of one-piece and two-piece ostomy appliance users and selected demographic variables. Chi - square is used to find out the association of self-maintenance of one-piece ostomy appliance users with selected demographic variables

Table 2: Association between demographic variables and self-maintenance on stoma care among one-piece ostomy appliance users. n = 40

Demographic variables	Below median	Above median	Chi square	Df	Remarks
1. Age >50 Years	6	15	0.8	1	Not
≤50 years	8	11			Significant
2. Gender Male	7	12	0.285		Not
Female	6	15		1	Significant
3. Education <Higher secondary	9	11	0.39	1	Not
Level ≥Higher secondary	7	13			Significant
4. Occupation Employed	3	8	5.96	1	Not
Others	12	17			Significant
5. Types of stoma Colostomy and Ileostomy	9	25	3.75	1	Not
Urostomy	4	2			Significant
6. Duration of using <15 months	10	21	0.0053	1	Not
appliances ≥15 months	3	6			Significant
7. Teaching on stoma Yes	9	25	7.23	1	Significant
Care No	5	1			
8. Sources of information Stoma nurse	10	24	6.05	1	Significant
of stoma care Others	5	1			

Chi square value (x^2) at df (1) = 3.84 ; p=0.05 level of significance

The data depicted in the table 2 represents that, the chi square was computed at 0.05 level of significance for the association between the self-maintenance of one-piece ostomy appliance users with the demographc variables.

Computed chi square value between the occupation, teaching on stoma care and sources of information of stoma care respectively are 5.96, 7.23 and 6.05, which were higher than the tabulated value chi square value i.e, 3.84 (df = 1, p=0.05) and statistically found significant at 0.05 level of

significance. There exist significant association between self-maintenance on stoma care and demographic variables of occupation, teaching on stoma care and sources of information of stoma care among the cancer patients with stoma using the one-piece ostomy appliance users at 0.05 level of significance. There exist no association between self-maintenance on stoma care and demographic variables of age, gender, education level, types of stoma and duration of using appliances.

Table 3: Association between demographic variables and self-maintenance on stoma care among two-piece ostomy appliance users. n= 40

Demographic variables	Below median	Above median	Chi square	Df	Remarks
1. Age >50 Years	8	15	1.27	1	Not Significant
≤50 years	9	8			
2. Gender Male	10	11	0.485	1	Not Significant
Female	7	12			
3. Education <Higher secondary	4	9	1.51	1	Not Significant
Level ≥Higher secondary	14	13			
4. Occupation Employed	10	4	13.7	1	Not Significant
Others	12	14			
5. Types of Colostomy and Ileostomy	14	20	0.118	1	Not Significant
stoma Urostomy	2	4			
6. Duration of using <15 months	13	19	3.9	1	Significant
appliances ≥15 months	4	4			
7. Teaching on stoma Yes	16	19	1.12	1	Not Significant
Care No	1	4			
8. Sources of information Stoma nurse	16	19	1.12	1	Not Significant
of stoma care Others	1	4			

Chi square value (x^2) at df (1) = 3.84 ; p=0.05 level of significance.

The data depicted in the table represents that, the chi square was computed at 0.05 level of significance for the association between the self-maintenance of two-piece ostomy appliance users and the demographc variables.

Computed chi square value between occupation and duration of using stoma appliances are 13.7 and 3.9, which were higher than the tabulated value chi square i.e, 3.84 (df =1, p=0.05) and statically found significant at 0.05 level of significance. There exist significant association between self-maintenance on stoma care and demographic variables of occupation and duration of using appliance among the cancer patients with stoma using the two-piece ostomy appliance users at 0.05 level of significance. There exist no association between self-maintenance on stoma care and demographic variables of age, gender, education level, types of stoma, teaching on stoma care and sources of information of stoma care.

Conclusion
- The study concluded that there was significant difference exist on self-maintenance of stoma care between one-piece and two-piece ostomy appliance users.
- There was significant association between self-maintenance of stoma care with occupation, the teaching on stoma care and sources of information on stoma care among one-piece ostomy appliance users.
- There was significant association between self-maintenance of stoma care with occupation and duration of using stoma appliances among two-piece ostomy appliance users.

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