



ADJUSTMENT TO COLOSTOMY: STOMA ACCEPTANCE, STOMA CARE SELF-EFFICACY AND INTER-PERSONAL RELATIONSHIPS

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3 **ADJUSTMENT TO COLOSTOMY: STOMA ACCEPTANCE,**
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5 **STOMA CARE SELF-EFFICACY AND INTER-PERSONAL**
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7 **RELATIONSHIPS**
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12 **Short title**

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15 Adjustment in Patients with a Colostomy
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20 **Authors**

21
22 Kingsley L. Simmons, PhD, MSc, BSc (Hons), RGN, RMN, PGCE
23

24
25 Principal Lecturer, University of Hertfordshire, UK
26

27
28 Tel: 01707285925; email: k.simmons@herts.ac.uk
29
30

31
32 Jane A. Smith, MA, RGN, Cert. Ed
33

34
35 Senior Lecturer, University of Hertfordshire, UK
36

37
38 Tel: 01707284060; email: j.6.smith@herts.ac.uk
39
40

41
42 Karen-Ann Bobb, RGN
43

44
45 Stoma Care Clinical Nurse Specialist, East and North Herts NHS Trust, UK
46

47
48 Tel: 01438 781133; email: karen.bobb@nhs.net
49
50

51
52 Laura L. M. Liles, RGN
53

54
55 Stoma Care Clinical Nurse Specialist, West Herts. NHS Trust, UK
56

57
58 Tel: 01727 897152; email: laura.liles@whht.nhs.co.uk
59

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ABSTRACT max 250 words**Aim:**

This paper is a report of a study examining adjustment and its relationship with stoma acceptance and social interaction and the link between stoma care self-efficacy and adjustment in the presence of acceptance and social interactions.

Background: There have been significant advances in stoma appliances and an increase in nurses specialising in stoma care. Despite this, a large proportion of patients continue to experience adjustment problems, which suggests that improvements in the management of the stoma are by themselves not enough to enhance psychosocial functioning. Illness acceptance and interpersonal relationships are widely reported as correlates of adjustment to chronic illness, but these have not been specifically examined in patients with a colostomy. Evidence of their association could offer stoma therapists alternative ways of aiding adjustment.

Method: Between 2000 and 2002, 51 patients with colostomies provided demographic and clinical data and completed validated questionnaires to measure acceptance of the stoma, relationship with others and stoma care self-efficacy six months after surgery.

Findings: Multiple regression analysis showed that stoma care self-efficacy, stoma acceptance, interpersonal relationship and location of the stoma were strongly associated with adjustment. The model explained 77% of the variance. Stoma-care self-efficacy accounted for 57.5%, the psychosocial

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3 variables 13% and location of the stoma 4.6%. The addition of gender,
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5 which was not statistically significant ($p>.05$), explained a further 1.9% of
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7 the variance.
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10 **Conclusion:** Addressing psychosocial concerns should become part of the
11
12 care routinely given to stoma patients. We recommend more emphasis on
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14 dispelling negative thoughts and encouraging social interactions.
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18 19 20 **KEY WORDS**

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22 Stoma care, adjustment, acceptance, nursing, self-efficacy, questionnaire,
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24 interpersonal relationships
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58 **SUMMARY STATEMENT**

59 **What is already known on this topic**
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- Technical advances in stoma appliances and increasing numbers of stoma therapists have resulted in improvements in colostomy management
- Psychosocial problems are prevalent and have not decreased in line with improvements in stoma management
- Patients having a colostomy undergo profound changes in life-style habits and negative beliefs about body image

What this study adds

- The competence of people to manage their colostomies is not sufficient to foster psychosocial adjustment and aid return to a full and active life.
- People who fail to accept their colostomy and who experience poor interpersonal relationships are less likely to report improvements in adjustment to stoma surgery.
- Colostomy care should involve strategies that encourage people to accept their stoma and engage in social activities.

INTRODUCTION

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3 The latest published worldwide estimate of colorectal cancers (IARC
4 GLOBOCAN, 2005), the diagnoses most likely to end with a colostomy
5 following surgery, suggested that one million new cases occur annually. In
6 Europe, new cases totalled 412,900 in 2006 (Ferlay *et al.*, 2007). However,
7 probably because of a combination of the publicity given to the benefits of
8 screening and improvements in surgical techniques and adjuvant therapy,
9 recent years have seen a gradual but steady decrease in the number of
10 patients dying within 5 years of diagnosis (American Cancer Society, 2007;
11 ISD Online, 2006). This suggests that patients with a colostomy as a result
12 of cancer would be expected to live with the associated consequences for
13 longer, a factor which has stimulated a number of studies examining quality
14 of life in stoma patients (Brown & Jacqueline, 2005; Karadag *et al.*, 2003).

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34 More than 13, 000 patients undergo stoma surgery each year in the United
35 Kingdom (UK) (Baxter & Salter, 2000), a high proportion of which ends
36 with a colostomy. Although in the majority of cases the surgery is a life-
37 saving procedure, it nonetheless represents a threat to both physical and
38 psychological functioning (Bekkers *et al.*, 1995; Brown & Jacqueline, 2005;
39 Sprangers *et al.*, 1995). How people adjust to these challenges has become
40 a focus of much research. Results so far suggest that perceived personal
41 control (Mc Vey *et al.*, 2001; White & Unwin, 1998) and stoma care self-
42 efficacy (Bekkers *et al.*, 1996), which form the theoretical base for the
43 present approach to stoma care, are influencing factors. However, despite
44 the best efforts of an increasing number of stoma therapists and
45 corresponding advances in stoma appliance technology, levels of
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maladjustment has changed little over the years (Brown & Jacqueline, 2005). This suggests that competence in self-care management is, by itself, insufficient to promote adjustment.

Studies of patients with chronic diseases suggest that adaptation is better in those who accept their diagnosis (Abraido-Lanza *et al.*, 2004) and have access to good supportive relationships (Giesse-Davis *et al.*, 2000), and worse in those with limited social activity (Bloom & Spiegel, 1984). The effects of these on adjustment to a colostomy have not been explicitly examined before, but we suspect their effects could be similar. Therefore, we evaluated their associations with adjustment in a survey of patients with colostomies six months after surgery. If associations are confirmed it would be necessary to review the care now provided by stoma therapists.

BACKGROUND

There are consistent reports of psychological and social dysfunction in patients whose surgery end with a colostomy. According to a review of studies published between 1969 and 1992 (Sprangers *et al.*, 1995), depression, loneliness, suicidal thoughts, and low self-esteem are prevalent, and significantly more so than in non-stoma patients. Sexual impairment, as shown in a follow-up evaluation of Finnish men who underwent rectal surgery a year earlier (Vironen *et al.*, 2006) and negative beliefs about body image (Brown & Jacqueline, 2005) are no less common. The major impact, however, is on social functioning, with patients reporting a decrease in

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3 social and leisure activities, an increase in marital problems and less contact
4 with relatives and friends (Sprangers *et al.*, 1995; Vironen *et al.*, 2006).
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10 There have been notable advances in the appliances used by patients with a
11 colostomy. The stoma plug is unobtrusive and effective in controlling
12 faecal leakage, gas emission and odour (Cazador *et al.*, 1993; Soliani *et al.*,
13 1992); the two-piece pouch or plug reduces the risk of skin excoriation; and
14 the flushable pouch assists with easy hygienic disposal of faecal contents
15 (McKenzie *et al.*, 2006) . In theory at least, these advances should help
16 patients regain the confidence to resume social and leisure pursuits.
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20 However, the continually high proportion who adjust poorly to the stoma
21 (Vironen *et al.*, 2006) suggests that technological improvements in the
22 appliances are not enough. Indeed, reports that patients who are competent
23 (Bekkers *et al.*, 1996; Piwonka & Merino, 1999) and those who believe in
24 taking personal control over the management of their stoma (Mc Vey *et al.*,
25 2001; White & Unwin, 1998) show better adjustment, reinforces the
26 argument that advances in technology *per se* have a limited impact on
27 adjustment.
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48 The current approach to colostomy care, which has changed little over the
49 years, takes account of patients' need to be self-sufficient and their desire
50 for personal control. Central to that care is training by specialist nurses in
51 the appropriate use of stoma appliances and the offer of advice on dietary
52 behaviours related to bowel control. So far there has been only limited
53 evaluation of the impact of that care on psychological outcomes and
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3 important improvements have been reported in the few studies that have
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5 evaluated this. Wade (1990) found lower levels of affective disorders in
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7 Welsh patients who had access to a stoma therapist. Karadag et al (2003),
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9 in an investigation with Turkish patients, found that those who received care
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11 from a stoma therapy nurse had substantially better quality of life than those
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13 who did not receive such care.
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19 However, flaws in the methodology of those studies leave their results open
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21 to question. For instance, there were no baseline assessments of emotional
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23 disorder in Wade's study. Therefore it would have been difficult to estimate
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25 how much patients had improved after receiving care from the stoma
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27 therapist. Quality of life is a concept which is variably defined, and it can
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29 be influenced by many factors, some of which could be inter-related. Yet
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31 Karadag and her colleagues used only univariate tests to unravel such
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33 complex relationships, without regard for *Type I* statistical error. Therefore
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35 the strength of the relationship between stoma therapy and quality of life,
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37 independent of other variables, is not clear. Furthermore, neither study can
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39 explain why in countries such as the UK, where there is almost universal
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41 access to a stoma therapist (Diversey Lever, 2006), psychological distress
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43 and social interaction remain problems for many patients.
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52 Many people with a disability use disengagement as a way of coping by, for
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54 example, avoiding situations that could arouse fear and distress (Livneh *et*
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56 *al.*, 2004), or because of concerns that they may not be accepted socially.
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58 Regarding the latter, the literature on chronic illness suggests that such
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3 concerns could be misplaced. Li & Moore (1998) have argued that if
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5 patients accept their own disabilities, they are more likely to be accepted by
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7 society at large. Studies have confirmed that such people receive more
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9 emotional support, perceive less discrimination, are higher in self-esteem
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11 (Li & Moore, 1998) and more satisfied with life (Livneh *et al.*, 2004). The
12
13 growing body of evidence from acceptance-based intervention studies
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15 showing statistically significant improvements in patients with pain (Dahl *et*
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17 *al.*, 2004; Gutterrez *et al.*, 2004) epilepsy (Lundgren *et al.*, 2006) and
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19 newly-fitted dentures (McGuire *et al.*, In press) offers further confirmation
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21 of the role of acceptance in the adaptation process. Yet no study seems to
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23 have explicitly examined links between acceptance and psychosocial
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25 adjustment in patients with colostomies, although these patients hold fears
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27 of public embarrassment and rejection, among other negative thoughts
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29 (Brown & Jacqueline, 2005),
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39 Talking about stressful life events in a supportive context is a key
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41 component of successful coping (Lepore *et al.*, 2000) and a positive
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43 adjustment behaviour (Pennebaker, 1993). Talking helps individuals to
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45 make sense of their experience (Lepore *et al.*, 1996) and achieve emotional
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47 resolution (Smyth, 1998). It is associated with psychological well-being
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49 (Arora *et al.*, In press; Mallinger *et al.*, 2006) and role and social
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51 functioning, as Kerr (2003) found in her prospective investigation of
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53 patients with rectal cancer. As the primary sources of support, patients are
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55 most likely to talk about health-related concerns with family and friends and
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57 healthcare professionals, and there can be little doubt of the benefits of
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3 doing so (Arora *et al.*, In press; Mallinger *et al.*, 2006; Piwonka & Merino,
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6 1999). However, it is doubtful whether all patients have the capacity to seek
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8 or mobilize the support available to them. People characterised by
9
10 dispositional pessimism (Friedman *et al.*, 2006) might feel that they would
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12 derive little benefit from social engagement, and those burdened with
13
14 intrusive thoughts about the adverse effects of the event (Lepore *et al.*,
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16 1996) could be inhibited. For example, patients who cognitively suppress
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18 thoughts about the adverse consequences of their illness might avoid
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20 interactions which could act as a reminder, thus restricting access to sources
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22 of both informational and emotional support. Given the volume of evidence
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24 confirming the predictive effect of social support on adaptation to chronic
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26 illness (Friedman *et al.*, 2006; Han *et al.*, 2005; Kerr *et al.*, 2003; Piwonka
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28 & Merino, 1999), we suggest that people with a colostomy who find it
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30 difficult to engage with family and friends are more likely to be poorly
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32 adjusted.
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41 In summary, like other patients with a chronic illness, adjustment in those
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43 with a colostomy could be much improved if they access the support which
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45 is available to them. This is more likely in patients who accept the
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47 limitations of their surgery and perceive less discomfort in their interactions
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49 with other people. It seems plausible that patients who are more accepting
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51 of their colostomy would be more likely to take control of their care,
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53 become better at managing it and less reluctant to interact socially. This
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55 suggests a complex relationship between acceptance, social interaction and
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3 stoma care self-efficacy which needs to be unravelled if we are to find other
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5 ways of delivering effective care to patients with colostomies.
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10 **THE STUDY**

11 **Aim**

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13 The aim of the study was to examine adjustment and its relationship with
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15 stoma acceptance and social interaction and the link between stoma care
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17 self-efficacy and adjustment in the presence of acceptance and social
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19 interactions.
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27 We predicted that:

- 28 - the more patients accept and come to terms with the limitations of
- 29 their colostomy, the higher will be their level of adjustment.
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- 31 - the more patients avoid social encounters the least likely they are to
- 32 be adjusted.
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40 **Participants**

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42 People who underwent colostomy surgery in one of two district hospitals in
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44 the UK were invited to take part in the study if they could read and write
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46 English. We excluded those who were clinically diagnosed with mental
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48 illness. Those conditions are characterised by feelings of loneliness, social
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50 isolation and cognitive impairment (Murray *et al.*, 2006; Smith *et al.*, 2006).
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52 Therefore the responses of such patients afflicted may not truly reflect
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54 stoma-related concerns. We used an upper limit of 80 years as a criterion
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56 for inclusion because discussions with stoma therapists suggested that
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3 beyond that age patients with colostomies are less socially active, and the
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5 creation of the stoma makes little difference in that regard.
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10 During the study period (2000-2002), 70 patients were approached. Seven
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12 refused to take part. Eleven did not complete the investigation due to death
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14 (3), reversal surgery (2) migration (2) or drop-out (4). One respondent was
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16 excluded on grounds of age. Therefore, 51 patients provided assessable data.
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18 All had access to a stoma therapist before surgery and after discharge from
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20 hospital.
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27 **Measures**

28 *Adjustment to a stoma*

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33 Adjustment to a stoma is defined here as the overall impact of the stoma on
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35 psychological, social and sexual functioning, as perceived by patients. The
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37 Ostomy Adjustment Scale (Olbrisch, 1983), which takes account of these
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39 variables, was designed specifically to assess the responses of patients with
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41 a stoma. It has 34 items, some in the negative direction, and each measured
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43 on a 6-point Likert scale. Higher scores indicate better adjustment. The
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45 reported reliability (Cronbach's alpha = 0.85; test-retest $r = .72$) was later
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47 confirmed in a study of Swedish patients with stomas (Brydolf *et al.*, 1994).
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50 Based on a factor analysis, Olbrisch produced two shortened 17-item
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52 versions (Short Form 1 and Short Form 2) and indicated that each could be
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54 used independently without impairing the reliability or validity of the
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56 original questionnaire. In this study we used Short Form 2.
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Acceptance of the stoma

Based on previous work by Felton (1984), we conceptualize stoma acceptance as the extent to which patients with colostomies accept the limitations of their surgery without experiencing negative feelings. We used the Acceptance of Illness Scale (AIS) (Felton, 1984) as the measure of acceptance. That scale has a high internal consistency (Cronbach's alpha =.081). However, because it measures acceptance of illness in general and we wanted respondents to focus on their stoma rather than on other pathologies, the word "illness" on the questionnaire items was substituted by the word "stoma". Using the responses from our sample, tests showed that the internal consistency of the scale had improved (Cronbach's alpha = 0.90). The AIS consists of 8 items, each measured on a 5-point Likert scale ranging from "Strongly agree" to "Strongly disagree". All but one of the items measure a negative attribute of the illness and are therefore scored in the negative direction (Strongly disagree = 5; strongly agree = 1.) Thus, higher scores indicate high acceptance.

Stoma Care Self-Efficacy

Stoma care self-efficacy refers to the conviction by patients that they can successfully manage their stoma to minimise adverse outcomes. Bekkers (1996) developed the Stoma Self-Efficacy Scale, which has two components, each assessing different concepts. One component, Stoma

Care Self-Efficacy (Cronbach's alpha = 0.94, 13 items), assesses expected self-efficacy regarding capability to care for one's stoma. The other, Social Self-Efficacy (Cronbach's alpha = 0.95), assesses self-efficacy regarding social functioning with the stoma. The two scales are highly correlated ($r = .73$). Therefore, if used in the same analysis, they can lead to unstable regression coefficients (Gordon, 1968). Bekkers (1996) has suggested that they be used separately. Because our focus was on patients' ability to care for their stoma, we used the Stoma Care Self-Efficacy subscale; respondents choose one of five categories, ranging from "not at all confident" to "extremely confident". Higher scores correspond to higher levels of confidence.

Interpersonal Relationships

Interpersonal relationships are defined as the ease with which one relates and interacts with other people. We measured this using the Sociable subscale of the Horowitz et al (1988) Inventory of Interpersonal Problems (test-retest = .82). This has 13 items, each prefixed by "It is hard for me to" and measured on a 5-point Likert scale ranging from "Not at all" (0) to "Extremely" (4). Therefore, higher scores indicate more problems with social relationships.

Data collection

On admission, consecutive patients fitting the study criteria were invited to participate, having had the study explained (orally and in writing) by the resident stoma therapist. They were told that we were investigating the

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3 impact of stoma surgery on people's lives. If they consented, they were
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5 asked to provide standard demographic data. Their medical records were
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7 the source of clinical data, including type of admission (planned or
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9 unplanned), type of stoma (colon or rectal), status of the disease (malignant
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11 or non-malignant) and post-surgical oncology treatment (chemotherapy and
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13 radiotherapy). Patients were given a choice between the conventional stoma
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15 pouch and the stoma plug, which is used interchangeably with the pouch.
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17 None of the patients in the study irrigated their stoma as this was not
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19 routinely offered in the source hospitals. Six months after surgery, when
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21 improvements in adjustment would have reached a plateau (Bekkers *et al.*,
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23 1996; Wade, 1990), participants received the battery of questionnaires,
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25 together with a stamped, self-addressed envelope for their return.
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31 32 **Ethical considerations**

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34 The Local Research Ethics Committees approved the study. In responding
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36 to our questionnaires, participants would be expected to recall experiences
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38 which could be stressful. Those receiving post-surgical treatment such as
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40 chemotherapy and radiotherapy could find participation an extra burden.
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42 These issues were discussed with people before they were asked to
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44 participate in the study. Those who had concerns after giving consent were
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46 encouraged to use the telephone service which, as part of normal practice at
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48 the source hospital, gives all patients with colostomies access to the resident
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50 stoma therapist.
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53 54 **Data analysis**

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56 The data were analysed using the Statistical Package for the Social Sciences
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58 (*SPSS, 12*). Multiple regression analysis was the main statistical approach.
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As suggested by Hosmer and Lemeshow (2000), all variables were first screened for their association with adjustment. Those with a statistically significant relationship ($p \leq .05$) were entered in a multiple regression analysis.

RESULTS

Demographics

Of the 51 participants (male = 27, female = 24) ranging in age from 30 to 78 years (mean = 57.2, sd = 10.96), 92% were married or co-habiting, 70% had planned surgery, 62.7% a rectal stoma, 68.6% a malignant tumour and 47.1% had chemotherapy or radiotherapy or a combination of these. Thirty patients (58.8%) chose to use the stoma plug. Table 1 shows the means and standard deviation of these variables on the adjustment scale. Participants who refused, or whose data were not analysed for other reasons, were older than the others (mean = 62yrs, sd = 11.02) and fewer had planned surgery (55.6%) and rectal stoma (50%). In all other respects the two groups were similar. Scores on the questionnaire measuring adjustment were skewed, indicating that most participants had adjusted to their stoma.

Adjustment

The results of the screening analysis (Table 2) showed that of the socio-demographic and clinical variables, only type of stoma ($t = -2.56, p = .005$) and gender ($t = -1.98, p = .04$) correlated significantly with adjustment. Stoma care self-efficacy ($t = 3.36, p = .002$), stoma acceptance ($t = 4.16, p$

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3 = $<.001$) and interpersonal problems ($t = -2.25, p = .03$) correlated with
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5 adjustment.
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9 The variables with statistically significant relationships in the screening
10 analysis were entered in a multiple regression. The model resulting from
11 that explained 77% of the variance in adjustment (Table 3). Of that, stoma
12 care self-efficacy accounted for 57.5%, psychosocial variables (acceptance
13 and interpersonal relationships) for 13 % and type of stoma for 4.6%.
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17 Although gender was not statistically significant ($p > .05$), its contribution to
18 the model added a further 1.9% to the explained variance.
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22 Stoma acceptance and interpersonal relationships were strongly correlated (r
23 = $-.55, p < .01$), and each correlated with stoma care self-efficacy ($r = .69$
24 and $-.43$ respectively, $p < .01$). However, according to the tolerance
25 statistics (range: $.54 - .82$) problems with collinearity are unlikely.
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29 Therefore, independent of each other, stoma care self-efficacy, stoma
30 acceptance and interpersonal relationships are statistically significantly
31 associated with adjustment. Thus, patients who accepted their stoma, were
32 able to manage it effectively and who experienced little or no distress in
33 social interactions were more likely to be adjusted six months after having
34 surgery. Adjustment was better in patients with a colon stoma.
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53 DISCUSSION

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55 People with a colostomy have to contend with substantial changes in bowel
56 functions, dietary habits and body image. Adjusting to these changes could
57 be challenging, but our results suggest that effective management of the
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stoma aids the process. Therefore, ensuring that people have the skills to manage their colostomy, as is currently the case, is important. However, as the results also show, psychosocial and to a lesser extent, disease factors also aid adjustment, which suggest that addressing these should also form part of the patient's care.

One of our main interests in this study was the role of acceptance of the stoma. Consistent with our prediction, those who accepted their colostomy were better adjusted. They expressed fewer fears of public embarrassment and inadequacy, lower levels of functional limitations and feelings of more control over their colostomy. This suggests that people who are more accepting of their colostomy would be less fearful of social rejection and more inclined to be proactive in seeking support. The public at large are sympathetic to the plight of people with long-term functional disabilities and readily offer the support requested of them (Li & Moore, 1998). Therefore, people who seek support outside the home are likely to receive it, not only from healthcare professionals but also from their wider social network. We suggest that patients with colostomies who accept their surgery are better able to use these sources of support. Given the benefits of social support on psychological functioning in people experiencing traumatic life events (Abraido-Lanza *et al.*, 2004; Pennebaker, 1993; Piwonka & Merino, 1999), it is not surprising that patients who accepted their stoma recorded higher levels of adjustment.

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3 Our other interest was the role of social interaction. As we predicted, scores
4 on the adjustment scale declined with increasing distress in social
5 interaction, as measured on the Inventory of Interpersonal Problems. Those
6 who adjusted poorly found it difficult to disclose their feelings and to
7 socialize, suggesting reluctance to engage in activities that could arouse
8 suppressed emotions associated with the colostomy. Alternatively, they
9 could have limited their contact with other people because they were
10 burdened with intrusive thoughts. Intrusive thoughts are common in
11 patients with distressing diagnoses (Lutgendork *et al.*, 1997) and hinder
12 social interaction (Lepore *et al.*, 1996). Therefore, the patients in our
13 sample who experienced problems with interpersonal relationships, whether
14 due to intrusive thoughts or fears of arousing suppressed emotions, would
15 have limited their opportunities for emotional disclosure and, as Lepore *et al*
16 (2000) suggested, this could have had a negative impact on their adjustment.
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39 Although there was a tendency for men to report higher levels of
40 adjustment, the anatomical site of the stoma was the only statistically
41 significant predictor among the demographic and clinical variables.
42 Participants with a rectal stoma reported more adjustment problems. They
43 were no more likely than the others to have post-surgical oncology
44 treatment ($\chi^2 = 3.3$, $df = 1$, $p = .09$), were younger ($p < .05$) and more had
45 planned surgery ($\chi^2 = 16.6$, $df =$, $p < .001$). However, none of this explains
46 why they should experience more problems, because neither age nor type of
47 admission predicted adjustment. Discussions with stoma specialists also
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3 offered no obvious explanation for the observation. Therefore, more work
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5 is needed to clarify this relationship.
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10 A diagnosis of cancer generates considerable psychological distress (Couper
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12 *et al.*, 2006). Therefore a difference might have been expected between
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14 patients with malignant and non-malignant disease. However, of our 36
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16 with a cancerous tumour, 25 attended for chemotherapy and/or radiotherapy
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18 post-surgery, and therefore they could have benefited from the regular
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20 contact with health care professionals. The lack of a stoma appliance effect
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22 is also surprising because the plug has been shown to be better at controlling
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24 faecal leakage and gas emission (Cazador *et al.*, 1993; Soliani *et al.*, 1992),
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26 and in our sample most participants favoured it ($\chi^2 = 4.2$, $df=1$, $p < .05$).
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28 However, for ethical reasons, participants chose between the pouch and the
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30 plug and so were not randomly selected for the appliance they used.
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33 Therefore failure to show an effect in favour of the plug could be the result
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35 of selection bias.
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43 **Study limitations**

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45 We are unable to confirm a causal relationship between adjustment and the
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47 psychosocial variables because they were all assessed at the same time.
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50 There was also overlap between the measure of adjustment and those of the
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52 psychosocial variables. Each, for example, assesses reaction to social
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54 gatherings. The very close association between these scales could explain
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56 the high level of variance explained by the model. These results cannot be
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58 extrapolated to people with a mental illness or those over 80 years of age
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3 because these people were excluded from the study. Finally, as a result of
4 the screening analysis, 5 variables were entered in the final model and rule
5 of thumb, often quoted by statisticians (Field, 2005), suggest the results
6 would be repeated in other samples. However, because the rule of thumb
7 approach is not the most scientific method for conducting sample size
8 calculations (Rashidian *et al.*, 2006), the power of the study could be open
9 to question.
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22 CONCLUSION

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24 Enhancing adjustment in people with a colostomy surgery is a prime focus
25 of care. However, the present approach to care is insufficient to do that
26 because it does not take account of cognitive and behavioural responses to
27 the colostomy. Our study suggests a better outcome for people if they can
28 be encouraged to accept their stoma and engage in social activities. The
29 challenge for stoma clinicians is to find ways of achieving this.
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41 The finding that people with a rectal stoma experience more adjustment
42 problems need to be confirmed in future studies. However, in the meantime
43 stoma therapists could consider offering them extra support.
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50 These findings challenge current practice in colostomy care, which fails to
51 address psychological responses to the surgery. This failure may be due, in
52 part, to present educational curricula which do not equip students with the
53 appropriate skills. A shift is therefore needed to a programme specifically
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3 designed to enable them to address patients' social and psychological
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5 concerns.
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8 **Author Contributions**

9
10 KS, JS and KB were responsible for the study conception and design and
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12 KS was responsible for the drafting of the manuscript.
13

14
15 KB, LL and JS performed the data collection and KS performed the data
16
17 analysis.
18

19
20 KS, JS, KB and LL made critical revisions to the paper.
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22 KS provided statistical expertise.
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25 KS supervised the study
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Table 1: Scores (mean and standard deviation) on adjustment scale according to socio-demographic and clinical variables

Variable	No	%	mean	Std. deviation
<u>Gender</u>				
Male	27	52.9	59.37	13.37
Female	24	47.1	54.83	16.11
<u>Co-habiting</u>				
Yes	47	92.2	56.43	15.02
No	4	7.8	66.75	5.74
<u>Admission</u>				
Planned	36	70.6	56.64	16.19
Emergency	15	29.4	58.67	10.85
<u>Stoma site</u>				
Colon	19	37.3	60.16	11.34
Rectum	32	62.7	55.5	16.36
<u>Disease</u>				
Malignant	35	68.6	58.95	14.19
Benign	16	31.4	53.44	15.68
<u>Appliance</u>				
Pouch	21	41.2	59.52	15.63
Plug	30	58.8	55.63	14.15
<u>Oncology treatment</u>				
Yes	24	47.1	61	12.17
No	27	52.9	53.89	16.20

Table 2: Results of screening analysis

<i>Variable</i>	<i>B</i>	<i>t</i>	<i>p</i>
Gender	-5.39	-2.04	.04
Age	.003	.02	.98
Co-habiting	3.56	.77	.45
Disease	5.79	1.61	.12
Stoma site	10.04	2.96	.005
Admission	.41	.11	.91
Appliance	-2.08	.11	.37
Oncology			
treatment	-1.99	-.60	.55
Acceptance	.89	4.11	.001
Interpersonal relationship	-.24	2.25	.03
Self-efficacy	.39	3.29	.002

Table 3: Model resulting from the multiple regression analysis

<i>Model</i>	<i>B</i>	<i>SEB</i>	<i>Beta (β)</i>	<i>P</i>
Stoma care self-efficacy	.44	.11	.38	.0001
Stoma acceptance	.81	.19	.42	.0001
Interpersonal problems	-.26	.09	-.23	.008
Type of stoma	-8.56	2.43	-.22	.001
Gender	-4.56	2.32	-.16	.055

Note: $\Delta R^2 = .575$ for Self-efficacy; $\Delta R^2 = .13$ for psychosocial variables; $\Delta R^2 = .046$ for stoma site