Abstract
Physical activity is important for physical and mental health; however, people with a stoma commonly experience a reduction in physical activity following stoma formation. Further research into physical activity levels in people living with a stoma is necessary to determine which factors are associated with engagement in regular physical activity, and with inactivity.

Aim The primary aim of this study was to assess physical activity levels in adults living with a stoma in the community. The secondary aim was to investigate the relationship between activity levels, self-efficacy for exercise, perceived benefits and barriers to exercise, depression, body image and stoma-related quality of life.

Method A cross-sectional questionnaire survey was sent to healthy individuals living with a urostomy, ileostomy or colostomy, recruited from six stoma support groups in the East Midlands. The primary measure was physical activity levels; secondary measures were self-efficacy for exercise, perceived barriers and benefits to physical activity, depression, body image and stoma-related quality of life. Descriptive analysis of the data was undertaken using a computer analysis package.

Results The questionnaire was sent to 116 adults and completed by 94 adults, giving a response rate of 81%. Of the participants who answered the questions on levels of physical activity, 83% (n=78/90) did not achieve government-recommended levels of physical activity. Less active participants perceived greater barriers to physical activity and had lower self-efficacy for exercise than participants who were more active. Reported physical activity was not associated with body image, depression or stoma-related quality of life.

Conclusion Most participants were physically inactive. Interventions that reduce barriers to exercise and support self-efficacy in people with a stoma can assist them to increase their physical activity levels, as well as reducing the risk of chronic disease associated with sedentary lifestyles.

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Keywords
body image, colostomy, continence, exercise, gastrointestinal, health promotion, ileostomy, lifestyles, patient outcomes, patients, quality of life, research, stoma care, urostomy

It is estimated that around one in 500 people in the UK has a stoma (Boyles and Hunt 2016). Several conditions may require stoma formation, including colorectal cancer, diverticular disease, ulcerative colitis and Crohn’s disease (Taylor 2005). There are three types of eliminating stomas – colostomy, ileostomy and urostomy – and each can be temporary or permanent (Hubbard et al 2017). A stoma can have significant negative effects on a patient’s quality of life (Hubbard et al 2017, Russell 2017). For example, Vonk-Klassenn et al’s (2016) systematic review identified several issues associated with having a stoma, including depression,
A national survey identified a trend towards physical inactivity after stoma surgery and a fear of exercise among these patients (Russell 2017).

The primary aim of this study was to assess activity levels in adults living with a stoma in the community.

Most of the participants in this study were inactive and did not achieve government-recommended levels of physical activity.

The results of this study suggest that positive attitudes towards the benefits of physical activity and greater self-efficacy are evident even in those who are minimally active; therefore, nurses could focus on encouraging people with a stoma who are sedentary to undertake even minimal physical activity.

values of ten or more minutes were included because this is the duration known to be beneficial to health (IPAQ 2004). Each activity is weighted against the energy requirements of the activity to produce a score in MET-minutes. The MET-minute is calculated by multiplying the MET score by the number of minutes undertaken and by the number of events per week (IPAQ 2004). The following values are used for the analysis of data: walking is 3.3 METs, moderate physical activity is 4.0 METs and vigorous physical activity is 8.0 METs. Scores determine whether the individual is ‘inactive’, ‘minimally’ active or ‘health-enhancing physical activity (HEPA)’ active as follows (IPAQ 2004):

- HEPA active – the person will have undertaken vigorous-intensity activity on at least three days and accumulated at least 1,500 MET-minutes per week or seven days of any combination of walking, moderate or vigorous-intensity activities accumulating at least 3,000 MET-minutes per week.
- Minimally active – the person will have completed three or more days of vigorous activity of at
least 20 minutes per day, or five or more days of moderate-intensity activity and/or walking of at least 30 minutes per day, or five or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes per week.

Inactive – the person will have no reported activity or will have not undertaken enough activity to be categorised as minimally active or HEPA active.

Self-efficacy for exercise
The Self-Efficacy for Exercise (SEE) scale was used to assess participants’ confidence to take part in exercise (Resnick and Jenkins 2000). This scale outlines nine elements that can affect participation in physical activity – weather, boredom, pain, exercising alone, whether or not the exercise is pleasurable, busyness, tiredness, stress and depression – and focuses on an individual’s confidence in their ability to engage in exercise despite these elements. Participants are asked to rate their confidence to ‘exercise three times per week for 20 minutes’ on a scale of 0-10, where 0 is ‘not confident’ and 10 is ‘very confident’. An overall score is calculated for each participant. Possible scores range from 0 to 90. Higher scores indicate a greater level of self-efficacy for exercise.

Depression
The Patient Health Questionnaire (PHQ-9) (Kroenke et al 2001) is a self-report measure that attaches a score to each of the nine criteria for depression according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) (American Psychiatric Association 2013): depressed mood or irritability; decreased interest or pleasure; significant weight loss or loss of appetite; changes in sleep pattern; changes in activity; fatigue or loss of energy; guilt or worthlessness; concentration; and suicidality. Participants are asked how often they have been ‘bothered’ by these symptoms over the last two weeks using a four-point Likert-type scale, where 0 is ‘not at all’, 1 is ‘several days’, 2 is ‘more than half the days’ and 3 is ‘nearly every day’. The total score for each participant is calculated to determine the PHQ-9 severity score. The maximum score is 27. Scores of 5-9, 10-14, 15-19 and 20-27 represent mild, moderate, moderately severe and severe depression, respectively, with scores of 4 or less indicating no signs of depression.

Stoma-related quality of life
Quality of life was measured by the Stoma-QoL questionnaire, which was designed specifically for patients with a colostomy or ileostomy (Prieto et al 2005). The Stoma-QoL questionnaire includes 20 items covering five domains: stoma appliance; sleep; sexual activity; relationships with family and friends; and social relationships. The questionnaire uses a four-point Likert-type scale where 1 is ‘always’, 2 is ‘sometimes’, 3 is ‘rarely’ and 4 is ‘not at all’. The combined score for each participant is calculated, with the highest possible score being 80 (optimal quality of life) and the lowest score being 20.

Body image
The Social Physique Anxiety Scale (SPAS) has been used to measure the anxiety that an individual feels when they perceive others may be evaluating their physique (Hart et al 1989). This 12-item scale asks participants to rank a range of statements concerning body image on a five-point Likert-type scale, where 1 is ‘not at all characteristic of me’, 2 is ‘slightly characteristic of me’, 3 is ‘moderately characteristic of me’, 4 is ‘very characteristic of me’, and 5 is ‘extremely characteristic of me’. Statements include: ‘I wish I wasn’t so uptight about my physique or figure’ and ‘When in a bathing suit, I often feel nervous about how well-proportioned my body is.’ The maximum total score is 60. Lower scores indicate reduced physique anxiety.

Benefits and barriers to exercise
Participants’ perceptions of the benefits and barriers to physical activity were assessed using the Exercise Benefits and Barriers Scale (EBBS) (Sechrist et al 1987). The benefits measure includes 29 items categorised into: life enhancement; physical performance; psychological outlook; social interaction; and preventative health. The barriers measure includes 14 items categorised into: exercise milieu; time expenditure; physical exertion; and family discouragement. Participants are asked to what extent they agree or disagree with the statements using a four-point Likert-type scale, where 1 is ‘strongly disagree’, 2 is ‘disagree’, 3 is ‘agree’ and 4 is ‘strongly agree’, and the barriers measure was reversed scored. Possible total scores range from 43 to 172. Higher total scores indicate increased perceived benefits of physical activity.

Eligibility
Permission was granted from the leads of six regional support groups. Individual group members were eligible to take part in the study if they had a stoma, attended a stoma support group and were over 18 years old. Participant information sheets were distributed by group leaders to 116 individuals attending one of the six groups and who met the eligibility criteria. The researcher attended one meeting for each group within the region and gave a brief presentation on the nature and purpose of the research. Potential participants were informed that participation was voluntary, that all responses would be treated in confidence and would be accessible only to the research team, and that no personal identifying information would be requested.

Ethics
Ethical approval for the study was obtained from the local institutional review board for healthy volunteers. Ethical issues relating to confidentiality, withdrawal and data protection were discussed with the group attendees. Consent was assumed by receipt of the completed questionnaire. Participants could choose to return the completed questionnaire in the post or leave it with the group leader for collection by the researcher.

Data analysis
Data were analysed using SPSS, a computer analysis package. Descriptive analysis was undertaken...
Results of the 116 individuals registered at the stoma support groups, 94 participants completed the questionnaire, giving a response rate of 81%. The participants were 48 women (51%) and 46 men (49%). Their ages ranged from 20–90 years. Ethnic origin included White British/Irish (n=70/94, 74%), Mixed White/Black Caribbean (n=6/94, 6%), Mixed White/Black African (n=3/94, 3%), Mixed White/Asian (n=3/94, 3%), Asian Indian (n=10/94, 11%), Asian Other (n=1/94, 1%), and Black African (n=1/94, 1%).

Stoma type was reported by 74 participants, including colostomy (n=30/94, 32%), ileostomy (n=39/94, 41%) or urostomy (n=5/94, 5%). Twenty participants did not respond or reported that they did not know their stoma type. Two thirds of participants had a permanent stoma (n=63/94, 67%), one third had a temporary stoma (n=29/94, 31%), and two participants did not respond.

Participants reported having had a stoma for between two months and 62.4 years.

Physical activity
MET intensity values were calculated for each participant using the IPAQ (2004) and categorised into three groups: inactive, minimally active and HEPA active. Participant METs are shown in Table 1, broken down by gender and whether people had temporary or permanent stomas. Data from participants who did not answer the stoma type and levels of physical activity questions (n=8) were not included in the subsequent data analysis detailed in Table 1.

Participants were categorised as inactive (n=36/86, 42%), minimally active (n=33/86, 41%) and HEPA active (n=15/86, 17%), respectively. Three quarters of participants were either inactive or minimally active (n=71/86, 83%) and thus did not achieve the government-recommended levels of 150 minutes of moderate-to-vigorous intensity physical activity per week (Department of Health, Physical Activity, Health Improvement and Protection 2011). There was a significant gender difference between categories, with HEPA-active participants marginally more likely to be female than male (p=0.05).

Self-efficacy for exercise
Mean scores for each of the SEE scale questions were calculated to determine the factors that are perceived to be the greatest challenge to confidence about participating in exercise. Scores were ranked from lowest to highest. Participants experienced the lowest levels of self-efficacy when they felt pain when exercising. Participants who did not answer the SEE scale questions in full were excluded from subsequent data analysis (n=2). Results are shown in Table 2.

The participants’ total mean SEE scale score (mean 40.8, SD 20.7) indicated moderate self-efficacy for exercise. SEE scale scores had a significant effect on MET intensity levels (F=3.04, p<0.001). The SEE scale mean score for inactive groups (n=34, mean 30.4) was significantly lower than the SEE scale mean scores for both minimally active groups (n=33, mean 46, p=0.03) and HEPA active groups (n=17, mean 49, p=0.01) (two participants did not answer the SEE scale in full; eight participants did not answer the physical activity questions).

There was no statistically significant difference in SEE scale mean scores between minimally active groups and HEPA active groups (p=0.61). Depression
The severity of depression score for each participant was calculated using the PHQ-9 (Kroenke 2014). Participants who did not fully complete the PHQ-9 were not included in data analysis (n=2). When categorised, 59/92 (64%) participants showed no

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Table 1. Sample characteristics and metabolic equivalent of task (MET) intensity level

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>MET intensity level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inactive n (%)</td>
</tr>
<tr>
<td>Total n=86</td>
<td></td>
<td>36 (42)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male (four participants did not respond) n=42</td>
<td>13 (15)</td>
</tr>
<tr>
<td></td>
<td>Female (four participants did not respond) n=44</td>
<td>23 (27)</td>
</tr>
<tr>
<td>Temporary or permanent stoma</td>
<td>Temporary (one participant did not respond) n=28</td>
<td>8 (9)</td>
</tr>
<tr>
<td></td>
<td>Permanent (seven participants did not respond) n=56</td>
<td>28 (33)</td>
</tr>
</tbody>
</table>
signs of depression, and 33/92 (36%) participants showed signs of depression. There was a trend towards a relationship between higher depression scores and lower levels of physical activity as assessed by the IPAQ (2004), although this did not reach statistical significance. Those participants showing signs of depression were more likely to have a MET intensity level of physically inactive (n=19/33, 58%) than minimally active (n=11/33, 33%) and HEPA active (n=3/33, 9%). Results of the PHQ-9 are shown in Table 3.

Stoma-related quality of life
Quality of life scores using the Stoma-QoL questionnaire ranged from 0 to 41, indicating low quality of life among the participants. Items were ranked by mean to identify the top five factors perceived to have the greatest effect on quality of life. ‘I become anxious when the stoma pouch is full’ was the most commonly identified effect on quality of life for these participants. A one-way ANOVA test was used to compare perceived quality of life to MET intensity levels. Participants who did not answer the Stoma-QoL questionnaire in full were not included in the data analysis (n=1). No significant difference was found in quality of life scores between MET intensity groups. Results of the Stoma-QoL questionnaire are shown in Table 4.

Body image
SPAS scores ranged from 12 to 52, indicating moderate physical anxiety among the participants. There were no significant differences in SPAS scores between participants who were classified as inactive, minimally active or HEPA active, suggesting that within the participants, body confidence was unrelated to physical activity levels. Mean scores for each of the SPAS statements were calculated to determine the factors that were most commonly associated with body confidence in the participants. The statements were ranked in order of lowest to highest scoring. The top five ranked statements were associated with negative perceptions of body image and confidence. Participants who did not answer the SPAS in full were excluded from data analysis (n=1). Results of the SPAS (the top five ranked statements) are shown in Table 5.

Exercise benefits and barriers
Benefits of, and barriers to, exercise were assessed using the EBBS and ranked from lowest to highest. The factors perceived to Table 2. Self-efficacy for Exercise (SEE) scale (n=92) and metabolic equivalent of task (MET) intensity levels

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Mean (SD+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>You felt pain when exercising</td>
<td>2.95 (3.0)</td>
</tr>
<tr>
<td>2</td>
<td>You felt depressed</td>
<td>3.56 (3.1)</td>
</tr>
<tr>
<td>3</td>
<td>You felt tired</td>
<td>3.79 (3.0)</td>
</tr>
<tr>
<td>4</td>
<td>You felt stressed</td>
<td>4.20 (2.9)</td>
</tr>
<tr>
<td>5</td>
<td>You did not enjoy it</td>
<td>4.81 (3.0)</td>
</tr>
<tr>
<td>6</td>
<td>You were bored by the programme or activity</td>
<td>4.85 (4.7)</td>
</tr>
<tr>
<td>7</td>
<td>You were too busy with other activities</td>
<td>5.19 (2.9)</td>
</tr>
<tr>
<td>8</td>
<td>You had to exercise alone</td>
<td>5.62 (3.0)</td>
</tr>
<tr>
<td>9</td>
<td>The weather was bothering you</td>
<td>5.80 (3.3)</td>
</tr>
<tr>
<td></td>
<td>SEE scale total mean</td>
<td>40.8 (20.7)</td>
</tr>
</tbody>
</table>

Table 3. Patient Health Questionnaire (PHQ-9) (n=92) and metabolic equivalent of task (MET) intensity levels

<table>
<thead>
<tr>
<th>Severity of depression</th>
<th>MET intensity level n (%)</th>
<th>Inactive</th>
<th>Minimally inactive</th>
<th>HEPA (health-enhancing physical activity) active</th>
</tr>
</thead>
<tbody>
<tr>
<td>No signs of depression</td>
<td>20 (34)</td>
<td>27 (46)</td>
<td>12 (20)</td>
<td></td>
</tr>
<tr>
<td>Signs of depression</td>
<td>19 (58)</td>
<td>11 (33)</td>
<td>3 (9)</td>
<td></td>
</tr>
</tbody>
</table>

PHQ-9 total mean score (SD): 3.22 (4.8)
PHQ-9 and MET Intensity level: F=3.05, p=0.53

Table 4. Stoma-QoL questionnaire (n=93) and metabolic equivalent of task (MET) intensity levels

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Mean (SD+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I become anxious when the pouch is full</td>
<td>1.76 (0.9)</td>
</tr>
<tr>
<td>2</td>
<td>My stoma makes me feel sexually unattractive</td>
<td>1.49 (1.2)</td>
</tr>
<tr>
<td>3</td>
<td>I feel embarrassed about my body because of my stoma</td>
<td>1.43 (1.1)</td>
</tr>
<tr>
<td>4</td>
<td>My stoma limits the clothes I can wear</td>
<td>1.35 (0.9)</td>
</tr>
<tr>
<td>5</td>
<td>I worry the pouch will loosen</td>
<td>0.95 (0.9)</td>
</tr>
<tr>
<td></td>
<td>Stoma-QoL total scale mean</td>
<td>19.3 (12.9)</td>
</tr>
</tbody>
</table>

Stoma-QoL and MET intensity level: F=0.40, p=0.67

SD=standard deviation; ***p≤ 0.001

SD=standard deviation; **p≤ 0.01

NS=not significant

**p≤ 0.05

**p≤ 0.01
be the greatest barriers to physical activity were physical exertion, time and accessibility. The factors perceived as beneficial to physical activity were primarily focused on the benefits to health. Scores for the total EBBS questionnaire ranged from 43 to 172. A one-way ANOVA test was conducted to compare the total EBBS score to MET intensity levels. EBBS scores were significantly lower in physically inactive participants compared with both minimally active participants and HEPA-active participants. Those with a higher total EBBS score (with greater perceived benefits) were more likely to be HEPA or minimally active than inactive. Conversely, those with a lower EBBS score (with fewer perceived benefits) were more likely to be physically inactive than minimally or HEPA active. No statistical significance was found between minimally active groups and HEPA-active groups (p=0.90). Participants who did not answer the EBBS in full were excluded from data analysis (n=3). Results of the EBBS are shown in Table 6, which can be viewed at rcni.com/exercise-table-6.

Discussion
Physical activity
Physical inactivity was prevalent in the study’s participants, with 83% (n=71/86) failing to achieve government-recommended levels of physical activity (Department of Health, Physical Activity, Health Improvement and Protection 2011). This is consistent with previous research showing reductions in physical activity following stoma formation (Dabirian et al 2010, Russell 2017). Although there is limited evidence around physical activity in people with a stoma, this study suggests that they may be less physically active than the general population. The rates of physical inactivity shown in this study are of concern because the IPAQ (2004) is a self-report scale, and study participants tend to over-report rather than under-report physical activity (Lee et al 2011).

Self-efficacy
Self-efficacy was significantly lower in those who were classified as inactive, compared with those who engaged in either minimal or HEPA activity levels. The fact that there was no difference in self-efficacy between minimal or HEPA activity levels suggests that the significant difference in self-efficacy is between those who are completely sedentary and those who engage in some level of physical activity, however minimal. It may be beneficial for nurses to focus on supporting individuals who are completely inactive towards engagement in some level of physical activity.

The relationship between self-efficacy and participation in physical activity is consistent with previous research (Lachman et al 2018). Additionally, the level of education that patients with a stoma receive can influence their self-efficacy and it may be necessary for nurses to provide more specific guidance for patients with a stoma on how to engage in physical activity (Bazaliński et al 2014). This is particularly important given evidence suggesting that patients with a stoma do not recall being given any advice about exercise or physical activity (Russell 2017). Nurses’ health promotion efforts could focus on the positive benefits of exercise, while addressing barriers to remaining active. Pain when exercising, feelings of depression and tiredness were associated with lower levels of self-efficacy for exercise in the participants. Improving the confidence of people with a stoma to engage in physical activity may also alleviate low mood and reduce tiredness, because active lifestyles can generate greater energy levels (Dabirian et al 2010, Mental Health Foundation 2013).

To develop self-efficacy for exercise in people with a stoma, as well as setting achievable exercise targets, it may be necessary for nurses to manage pain expectations around physical activity. Variations in the severity of the patient’s condition, co-morbidities, self-perceptions and anxieties around the potential worsening of their condition can influence people’s self-efficacy and physical activity levels and should be taken into account when designing physical activity interventions (Ross et al 2007, Simmons et al 2007, Lachman et al 2018).

Depression
While depression is common in adults with a stoma, the participants did not report particularly low mood, although there was a non-significant tendency for those with lower mood to be less active. The female participants were more active than male participants, reversing patterns found in the general population (Azevedo et al 2007).

Quality of life
Quality of life can vary between individuals with a stoma. For some, the creation of a stoma will improve their quality of life, while for others there will be negative effects (Dabirian et al 2010). This was reflected in comments made by participants in this study in the free text section of the questionnaire.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In the presence of others, I feel apprehensive about my physique</td>
<td>2.71 (1.3)</td>
</tr>
<tr>
<td>2</td>
<td>It would make me uncomfortable to know others were evaluating my physique</td>
<td>2.87 (1.3)</td>
</tr>
<tr>
<td>3</td>
<td>Unattractive features of my physique make me nervous in social situations</td>
<td>2.91 (1.3)</td>
</tr>
<tr>
<td>4</td>
<td>When it comes to displaying my physique to others, I am a shy person</td>
<td>3.00 (1.3)</td>
</tr>
<tr>
<td>5</td>
<td>When in a bathing suit, I often feel nervous about how well-proportioned my body is</td>
<td>3.06 (1.5)</td>
</tr>
</tbody>
</table>

Table 5. Social Physique Anxiety Scale (SPAS) (n=93) and metabolic equivalent of task (MET) intensity levels

SPAS and MET intensity level: F=1.97, p=0.15
SD=standard deviation; *p=not significant
One participant referred to the stress of the stoma ‘leaking without warning’, while another participant reported that the stoma was the ‘best thing to happen’ to them with regards to improved quality of life.

Quality of life has been shown to improve as individuals adapt to living with their stoma (Dabirian et al 2010). Although general quality of life has shown to enhance health and participation in physical activity, stoma-related quality of life was not significantly associated with physical activity levels among participants in this study (Gill et al 2013). However, it has been proposed that attending a support group improves quality of life, which may reflect a bias in the participants.

Factors that negatively affected quality of life in this study’s participants included anxiety as the pouch became full and feeling sexually unattractive. These factors concur with previous research and may be important considerations in the design of interventions to support self-efficacy for exercise, reduce anxiety and ultimately increase physical activity in people with a stoma (Ross et al 2007, Wu et al 2007). One approach for nurses is to ensure that they encourage self-care and provide patients with health promotion education preoperatively and post-operatively to promote recovery, and improve self-efficacy and quality of life before discharge.

**Body image**

People with a stoma often experience low self-confidence because of altered body image (Ross et al 2007). Physique anxiety was moderate among the participants in this study. The measure of body image (SPAS) used in this study indicated that any reported physique anxiety was most often related to the participants’ body proportion, apprehension about physique and perceived unattractive features. However, there was no significant relationship between body image and levels of physical activity.

**Exercise benefits and barriers**

Lack of time is the most commonly cited barrier to physical activity in the general population (Bautista et al 2011). While this was identified as a factor for the participants, it was not the most prevalent issue; physical exertion and fatigue were more commonly reported barriers to exercise. Previous studies have similarly identified physical exertion as a barrier to physical activity in individuals with long-term conditions (Lynch et al 2007).

Concerns about damaging the stoma, developing parastomal hernias and pain have been previously identified as barriers to physical activity in adults with a stoma (Wu et al 2007). These condition-specific factors are not assessed by the EBBS. However, participants’ responses to the SEE scale indicated that pain during exercise was one of the factors that would have a negative effect on exercise self-efficacy (Table 2). Further investigation is required into the concerns and expectations of people with a stoma around pain during exercise, which would inform approaches to increasing physical activity in this population.

Participants in this study were most likely to report perceived benefits of exercise that were related to their physical health, for example prevention of heart attacks and increasing fitness. Earlier research on participants without stomas has shown that improvement to health and fitness can be a significant motivation to engage in physical activity (Zunft et al 1999). Improved psychological health, stress management, and self-esteem are known benefits of physical activity (Blake 2012). However, psychological benefits of exercise were not commonly identified in the EBBS by the participants in this study, and there was no statistically significant relationship between depression and physical activity, or body image and physical activity. It should be recognised that most of the participants in this study did not report low mood or low self-efficacy.

**Nursing interventions**

Most of the participants in this study were inactive and did not achieve government-recommended levels of physical activity (Department of Health, Physical Activity, Health Improvement and Protection 2011). Overall, there is a need to increase physical activity levels in people living with a stoma in the community to reduce the risk of comorbidities associated with sedentary lifestyles. Efforts should be made by nurses to address stoma-related barriers to exercise and provide education and support around physical activity for those living with a stoma. Any interventions should promote the health benefits of active lifestyles and foster self-efficacy for exercise, which is important for initiating and sustaining change in health behaviour. Nurses could offer tailored physical activity advice and targets, according to the individual patient’s condition and capability. Advice may include setting gentle-walking targets with gradual increments in distance. Similarly, advice could be offered to people with a stoma who want to engage in specific activities, for example the use of a stoma cap or a mini-pouch for swimming, and the avoidance of physical activities that involve intense physical contact.

People with a stoma should be supported to manage their expectations of physical activity, and to set appropriate targets that consider stoma-related symptoms, including pain, and the fear of pain. In people living with a stoma, strategies that support self-efficacy for exercise, such as setting small achievable targets, will be important for any long-term maintenance of lifestyle changes.

The results of this study suggest that positive attitudes towards the benefits of physical activity and greater self-efficacy are evident even in those who are minimally active; therefore, nurses could focus on encouraging people with a stoma who are sedentary to undertake even minimal physical activity.

**Limitations**

The sample in this study was limited to adults with a stoma attending a support group and may not be representative of the wider stoma population. For example, those accessing support groups may feel a greater need for support and be less well-adjusted to living...
with their stoma than those not accessing such groups (Hu et al 2014). Conversely, as individuals who are actively seeking support, they could be more well-adjusted, with improved psychological well-being, social support and quality of life compared with individuals not accessing support groups (Docherty 2004).

The study used self-report measures of physical activity; objective physical activity data was not collected. In addition, the study was cross-sectional and did not enable assessment of any changes in physical activity behaviour over time. A longitudinal study may demonstrate whether physical activity levels change as individuals adapt to living with a stoma.

No data were collected on participants’ other health conditions, use of healthcare services or extent of professional support received, although there is potential for these factors to influence participants’ health behaviours and well-being.

Conclusion
This study used a cross-sectional questionnaire survey to examine the activity levels of adults living with a stoma in the community, most of whom were physically inactive. The study found that less active participants perceived greater barriers to physical activity, and had lower self-efficacy for exercise than those participants who were more active. Reported physical activity was not associated with body image, depression or stoma-related quality of life. The authors conclude that interventions which reduce barriers to exercise and support self-efficacy in people with a stoma may assist them to increase their physical activity levels, as well as reducing the risk of chronic disease associated with sedentary lifestyles.

IMPLICATIONS FOR PRACTICE
» Efforts should be made to address stoma-related barriers to exercise, and provide education and support around physical activity, in people with a stoma

» Nurses should promote the health benefits of active lifestyles, and foster self-efficacy for exercise, which is important for initiating and sustaining changes in health behaviour.

References
Bandura_SocialLearningTheory.pdf