

SOCIAL SUPPORT AND PHYSICAL ACTIVITY IN THE PERIOPERATIVE PERIOD AND SIX MONTHS AFTER COLORECTAL CANCER SURGERY

Jarosław Ocalewski, Patrycja Michalska, and Paweł Izdebski

Department of Health Psychology
Kazimierz Wielki University in Bydgoszcz

According to the recommendations of the ERAS protocol, physical activity is a key behaviour for pre-surgical preparation of patients. Our research aimed at determining the relationship between social support and physical activity in preparation for colon cancer resection and half a year after the surgery. The research was carried out among patients with colon cancer. The measurement used a longitudinal scheme, before the surgery (T1) ($N = 151$) and six months after (T2) ($N = 105$). We measured such variables as: physical activity, social support (OSS-3), the feeling of self-efficacy (GSES), and the experienced disease symptoms (Brief IPQ). A decrease in the intensity of physical activity before the surgery was reported comparing to the period before cancer had been diagnosed. Before the surgery, social support facilitated an increase in the intensity of physical activity, whereas half a year after the surgery social support had a negative impact on the intensity of physical activity. Social support does not contribute to patients' physical activity after the surgery. This conclusion ought to be considered when directing families and caregivers not to relieve the patients of carrying out the majority of their duties after the surgery.

Keywords: social support; physical activity; colorectal cancer; perioperative period.

JAROSŁAW OCALEWSKI, <https://orcid.org/0000-0002-5863-4124>; PATRYCJA MICHALSKA, <https://orcid.org/0000-0003-0896-5037>; PAWEŁ IZDEBSKI, <https://orcid.org/0000-0002-3204-4898>. Correspondence concerning this article can be addressed to JAROSŁAW OCALEWSKI, Uniwersytet Kazimierza Wielkiego w Bydgoszczy, Katedra Psychologii Zdrowia, ul. Leopolda Staffa 1, 85-167 Bydgoszcz, Poland; e-mail: jareko@ukw.edu.pl.

The research was conducted as part of a grant funded by the National Science Centre, Poland, no. 2017/25/N/HS6/01365, "The role of cognitive and emotional factors in adaptation to cancer".

Handling editor: PRZEMYSŁAW BĄBEL, Jagiellonian University in Kraków.

Received 17 Feb. 2021. Received in revised form 11 July 2021. Accepted 28 Sept. 2021. Published online 26 Nov. 2021.

Health-related social support is defined as a sum of all efforts made by the members of a support network centered on providing help and positive feedback in order to promote behaviors which are beneficial for health (Gallant, 2016). In healthcare, social support has long been regarded as a factor that protects against life stress and negative health conditions. Social support is important for changing health-related behaviors among cancer patients (Law et al., 2018). Nevertheless, the results of previous studies have not verified the role of social support in shaping health-related behaviors among colorectal cancer patients at individual stages of treatment—before the surgery and half a year later. The treatment of colorectal cancer mainly requires a surgical excision of a part or the whole of the rectum along with the tumor and mesorectum which contains adipose tissue and the regional lymph basin with a margin of healthy tissues (Krouse, 2010).

Patients awaiting surgery are expected to reduce smoking tobacco and alcohol intake, as well as introduce regular physical activity (PA) adjusted to their abilities in order to improve their physical efficiency (Lindström et al., 2008). Studies prove that such behavior lowers the amount of postsurgical complications and accelerates the regain of returning to full activity after the surgery (Carli et al., 2010). According to the recommendations of the Enhanced Recovery After Surgery (ERAS) protocol the key factor for pre- and postsurgical care is motivating patients to self-activity in order to facilitate convalescence. Introducing systematic PA in the form of 30-minute walks or cycling every day over a 4-week period prior to the surgery increases the preoperative physiological reserves of the patient and decreases the risk of developing postsurgical complications (Barberan-Garcia et al., 2018). The studies showed a relationship between the symptoms of cancer and physical activity. For instance, Beckman et al. showed that physical activity reduces the symptoms of cancer (Backman et al., 2014).

Studies on the relationship between PA and received social support among oncological patients provide unambiguous conclusions. In 2009, Stephenson et al., demonstrated that there is no relationship between PA and perceived social support among colorectal cancer patients (Stephenson et al., 2009). On the other hand, Lee et al. (2018) pointed out that family support is significant for undertaking PA (Lee et al., 2018). The ambiguity of the previous reports and contemporary recommendations concerning the introduction of pre-surgery PA prompts carrying out further scientific studies in this area. Seeking the predictors of health behaviors, scientists should also consider the sense of self-efficacy. This factor is regarded as the best predictor of behavioral change and its influence on making health-related decisions has been widely documented (Schwarzer et al., 2008). Cognitive psychology sees the sense of self-efficacy as the strength of conviction that a person is able to fulfill particular activities or achieve their intended aims.

The present study aimed to determine the relationship between PA and social support, self-efficacy, disease symptoms in the course of disease with two different time intervals: preparation for colorectal cancer resection and six months after the surgery. The main hypothesis is the following: **Social support increases PA in the preoperative period and six months after surgery.** Self-efficacy and cancer symptoms are predictors of this relationship.

METHOD

Participants

The participants of the study were qualified from patients sent to the Clinical Department of Surgical Oncology at the Oncology Centre for colorectal cancer resection. They all met the following entry criteria for the study: a diagnosis of one of the following types of colorectal cancer:

- colon (C18), rectosigmoid junction (C19), rectum (C20), anal canal (C21);
- request of colorectal cancer removal (by means of laparoscopic hemicolectomy, lower anterior resection of the rectum, abdominoperineal resection of the rectum, other type of surgical procedure);
- age of over 18 years; the criteria for exclusion included a history of cancer cases and being at risk of undernourishment ($\text{BMI} < 18.5 \text{ kg/m}^2$) in the period preceding the CRC surgery.

Procedure

The study used a longitudinal design, a week before the surgery (T1) and six months after the surgery (T2). One month before the first measure during a visit to the anesthesiologist, patients were given a leaflet designed using the recommendations of the ERAS protocol, which suggested undertaking moderate, at least 30-minute PA (a walk, Nordic walking, cycling). The six-month interval between the measurements was based on clinical observations that in the time when supplementary chemotherapy is completed the patients' physical functioning relatively improves. Each patient was handed an information leaflet based on the ERAS protocol one month before the first measurement. At T1, patients were asked to determine their health-related behaviors during the last month before the surgery. At T2, patients were asked about any increase in health-related behaviors in the last month before

the study. The obtained results were analyzed through descriptive statistics and statistical inference (Statistica 13).

The project received a positive opinion from the Independent Ethics Committee (the name of the institute, decision and number are concealed to ensure the authors' anonymity). The project was carried out as part of a grant financed by the National Science Centre, Poland (no. 2017/25/N/HS6/01365).

The first measurement before the surgery involved 151 participants ($M_{\text{age}} = 64.89$, $SD_{\text{age}} = 10.14$), while the second was carried out six months after the surgery and covered 105 participants ($M_{\text{age}} = 64.39$, $SD_{\text{age}} = 10.51$). Most were men (about 65%), and the most frequent type of surgery was lower anterior resection of the rectum (44%). The other surgeries included sigmoid tumor resection or Transanal Endoscopic Microsurgery. Preoperative (neoadjuvant) treatment in the form of chemotherapy, radiotherapy or chemo-radiotherapy was applied in 40% of the patients. Adjuvant therapy was applied in 45% of the patients (T2). The sociodemographic variables and the percentage of the people in particular sample groups before the surgery ($N = 151$) and six months later ($N = 105$) are shown in Table 1.

Table 1

Population and Percentage of People in Particular Sample Groups Before Surgery ($N = 151$) and 6 Months After ($N = 105$)

	T1 ($N = 151$)		T2 ($N = 105$)	
	Before surgery		6 months after	
	Number	%	Number	%
Gender				
men	100	66.23	71	67.62
women	51	33.77	34	32.38
Place of residence				
city	101	66.89	65	61.90
country	50	33.11	40	38.10
Marital status				
single	7	4.64	5	4.76
married	115	76.16	82	78.10
widowed	24	15.89	16	15.24
divorced	5	3.31	2	1.90

Education				
primary	22	14.57	12	11.44
vocational	52	34.44	37	35.24
secondary	54	35.76	37	35.24
higher	23	15.23	19	18.10
Type of cancer				
colorectal (C18)	51	33.77	37	35.24
rectosigmoid junction (C19)	17	11.26	13	12.38
rectum (C20) and anal canal C21)	73	48.34	48	45.71
colon or Rectum of uncertain or unknown behavior	10	6.62	7	6.67
Neoadjuvant therapy				
not applied	90	59.60	66	62.86
chemotherapy	2	1.32	2	1.90
radiotherapy	21	13.91	15	14.29
chemo-radiotherapy	38	25.17	22	20.95
Adjuvant therapy				
not applied	86	56.95	55	56.19
chemotherapy	56	37.09	42	40.95
radiotherapy	1	0.01	0	0.00
chemo-radiotherapy	8	5.30	3	2.86
Type of surgery				
laparoscopic hemicolectomy	32	21.19	23	21.90
lower anterior resection of rectum	67	44.37	48	45.71
abdominoperineal resection of rectum	26	17.22	17	16.19
another surgery or postponed	26	17.22	17	16.19
The extent of spread of cancer				
0	9	5.96	5	4.76
I	30	19.87	21	20.00
II	42	27.81	33	31.43
III	67	44.37	44	41.90
IV	3	1.99	2	1.90
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Physical activity	388.61	308.28	319.43	206.71
Social support	10.62	2.63	10.71	2.81
Self-efficacy	31.50	5.49	32.19	4.78

Note. T1 = value before colorectal cancer resection, T2 = value half a year after surgery.

In the T1 and T2 similar percentage shares were obtained for the variables of gender, place of residence, marital status, education, type of cancer, therapy and surgery and the extent of spread of cancer. Dropout analyses were performed for social support and PA. For example social support in T1 ($M = 10.21$, $SD = 2.77$) among people who did not participate in T2 was not significantly different ($p = .362$) from all the participants of T1 ($M = 10.79$, $SD = 2.56$). Self-efficacy in T1 ($M = 30.91$, $SD = 6.63$) among people who did not participate in T2 was not significantly different ($p = .183$) from the rest of the participants of T1 ($M = 32.19$, $SD = 4.78$). Physical activity in T1 ($M = 379.23$, $SD = 383.13$) among people who did not participate in T2 was not significantly different ($p = .806$). It allowed us to compare the results in T1 and T2. There was a statistically significant difference ($p = .046$) between PA in T1 ($M = 388.61$, $SD = 308.28$) and PA in T2 ($M = 319.43$, $SD = 206.71$). It means that patients show lower PA six months after tumor resection than before the surgery.

Measures

Physical Activity

The patients' PA was operationalized based on the time of everyday activities (walking, cycling, housework requiring PA, gardening, and other physical activities). A respondent determined the weekly amount of time devoted to particular types of activity assuming that a single event lasts 30 minutes. This way a PA marker was obtained. The reliability of the PA scale was Cronbach's $\alpha = .66$.

Social Support

Social support is understood as a perceived resource which can be resorted to when a subject encounters personal problems or seeks particular instrumental help (advice, money). We applied The Oslo Social Support Scale-3-items (OSS-3), by Dalgard (Dalgard, 1996), recommended by the WHO (Melzer, 2003). OSS-3 has been used in numerous studies which confirmed its predictiveness with regards to psychical and physical functioning of healthy and ill people. The reliability of the tool obtained in our own study was satisfactory (Cronbach's $\alpha = .60$).

Self-Efficacy

The Generalized Self-Efficacy Scale (GSES) (Schwarzer & Jerusalem, 1992) measures the strength of the general conviction of an individual about their effectiveness in coping with difficult situations and obstacles. It is designed for measuring healthy and ill adults. The sense of self-efficacy determines the intentions and activities in various areas of health-related behavior. The reliability of the tool obtained in our own study was satisfactory (Cronbach's $\alpha = .89$).

Experienced Symptoms of Cancer

Symptoms constitute a cognitive component which indicates the degree of the experienced symptoms (ranging from "lack of symptoms" to "numerous severe symptoms"). This position was operationalized on the basis of the Illness Perception Questionnaire, developed by Broadbent, Petrie, Main, and Weinmann (2006) (Brief IPQ) (Broadbent et al., 2006). The tool is designed to appraise the representations and factors which may cause an illness. The reliability measured by test-retest = .75 after six weeks. The questionnaire was constructed from a semantic scale which consists of bipolar descriptions, e.g., "does not influence at all"–"influences completely".

RESULTS

The analyses of significant differences regarding socio-demographic variables were carried out with respect to gender, place of residence, marital status in the T1 and T2 measurements due to SS, PA, and self-efficacy. The only statistically significant difference was in the severity of PA with regard to the place of residence before the operation (1st measurement: $t(149) = 3.06$; $p = 0.003$). People living in the countryside showed higher PA ($M = 495.00$) than city residents ($M = 335.94$). However, six months after the operation, no significant differences were found in this respect (2nd measurement: $t(103) = 0.42$; $p = 0.676$).

The analysis revealed a statistically significant change in the time of PA six months after the surgery ($M = 319.43$; $SD = 206.71$) comparing to a week before the surgery ($M = 388.61$; $SD = 308.28$; $p = .046$). While building the models of multivariate regression, we singled out the following variables which are significant for explaining the PA in T1: age, self-efficacy, symptoms, and social support. The T1 Model explained 13% of the variance changeability of PA ($F(4, 1143) = 6.60$;

$p < .001$), ((social support ($\beta = .18$; $p < .05$), self-efficacy ($\beta = .16$; $p < .05$), and symptoms ($\beta = -.16$; $p < .05$)). The symptoms variable explained only 2% of the PA variance. Similar analyses were carried out for the time of PA in T2, putting the same data into multivariate regression but adequate for T2. The significant predictors were: symptoms ($\beta = -.34$; $p = .002$) and social support. The standardized regression coefficient of social support was negative ($\beta = -.20$; $p < .05$). This model explained 18% of the variance changeability of PA T2 ($F(4, 92) = 6.24$; $p < .001$) (Table 2). Medical variables: the type of surgery, applied stoma, and adjuvant treatment were not significant predictors of the PA.

Table 2

Results of Multivariate Regression Analysis for Time of Physical Activity During T1 and T2

Variables	T1; $R^2 = .16$; adjusted $R^2 = .33$ $F(4, 14) = 6.61$; $p < .001$					T2; $R^2 = .21$; adjusted $R^2 = .18$ $F(4, 92) = 6.24$; $p < .001$				
	β	$SE \beta$	t	p	R^2	β	$SE \beta$	t	p	R^2
Absolute term			1.99	.049				3.89	<.001	
Age	-.24	.08	-3.13	.002	.05	-.19	.09	-1.98	.048	.05
Self-efficacy	.16	.08	2.10	.037	.05	.03	.11	.31	.757	n.s.
Symptoms	-.16	.08	-2.02	.046	.03	-.34	.11	-3.15	.002	.13
Social support	.18	.08	2.32	.021	.02	-.20	.10	-2.05	.042	.03

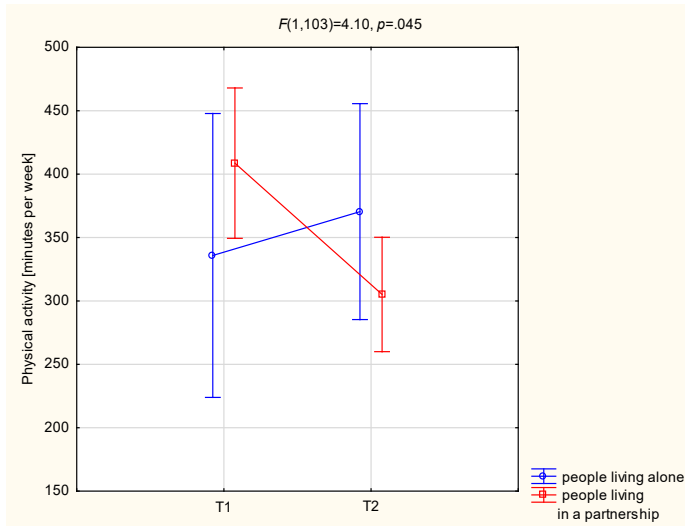
Note. T1 = value a week before colorectal cancer resection; T2 = value 6 months after surgery; R^2 = coefficient of determination; adjusted R^2 = the corrected coefficient of determination; β = standardized regression coefficient for T1 or T2; $SE \beta$ = standard error for standardized beta.

The identity variable explained the highest amount of PA variance ($R^2 = 13\%$). We also indicated an interaction between the time of measurement and the groups: people living alone/people living in partnership with regards to PA ($F(1, 103) = 4.10$; $p = .045$; $\eta^2 = .04$) (Figure 1).

Before the surgery (T1) single patients who lived alone reported a lower amount of time of PA ($M = 379.17$; $SD = 336.30$) than people living in partnership ($M = 391.57$; $SD = 300.48$). A reverse relationship was observed half a year after the surgery. The PA of people who lived alone ($M = 370.43$; $SD = 234.20$) was higher than among respondents living in partnership ($M = 305.12$; $SD = 197.53$) (Figure 1). Additionally, it was shown that there was no statistical difference in social support between people living alone and people living in partnership (T1, T2).

Figure 1

Interaction of Marital Status Variable (T1, T2) and Time of Physical Activity



Physical activity, understood as sports and recreational activity, PA-SR (walking, cycling, gymnastics), and home physical activity, PA-H (home assignments), were operationalized. The correlation between social support and PA-SR ($r = .18$; $p < .001$) was observed in the preoperative period (T1), while there were no correlations with PA-H ($r = .07$; $p = .373$). In the postoperative period (T2), the correlation of social support was not statistically significant with PA-SR ($r = .07$; $p = .471$), while it was statistically significant with PA-H ($r = -.19$; $p = .048$).

We carried out a mediation analysis procedure (as per Baron and Kenny (1986)) of self-efficacy between tumor symptoms and PA. In the preoperative period, the greater the symptoms of neoplasm ($\beta = -.16$; $p = .049$), the lower the PA; with the increase in self-efficacy ($\beta = .18$; $p = .030$), the PA increases. A mediating role of self-efficacy ($\beta = .16$; $p = .045$) was observed between symptoms ($\beta = -.10$; $p = .200$) and PA. However, in the postoperative period, it occurred that the tumor symptoms ($\beta = -.30$; $p = .007$) play a mediating role between self-efficacy ($\beta = .08$; $p = .468$) and PA. In the preoperative period, the greater the symptoms of neoplasm ($\beta = -.16$; $p = .049$), the lower the PA, while with increasing SS ($\beta = .18$; $p = .027$) the PA increases. The mediating role of SS ($\beta = .16$; $p = .045$) between symptoms ($\beta = -.14$; $p = .008$) and PA was proved. In the postoperative period, SS did not play a mediating role ($\beta = -.06$; $p = .488$) between tumor symptoms and PA ($\beta = .34$; $p < .001$).

DISCUSSION

The recommendations in the ERAS protocol advise to undertake deliberate activities such as walking or cycling for at least 30 minutes a day before the surgery. Before the surgery it was reported that 58.28% of patients followed these recommendations, while six months after the surgery this statistic was 47.62%. A small percentage of active patients, limitations of PA after diagnosis and during the course of treatment are a common problem confirmed by other researchers (Possmark et al., 2019; Hawkins et al., 2010).

It is generally assumed that social support has a positive impact on shaping health behaviors (Lee et al., 2018; Fujisawa et al., 2014; McDonough et al., 2019) and psychical health (Faleschini et al., 2019; Wong et al., 2006). In this study, social support is regarded as perceived support, a subjective feeling but not actually received help. The perceived social support describes whether patient can count on others when he or she has general serious personal problems. It did not include the physical activity needed for the recovery process. Similarly, this study has shown that social support facilitates the PA before the surgery. Nevertheless, six months after the surgery, an important role of social support for this type of health behavior was observed: the higher the perceived social support, the lower PA. This can be explained by the phenomenon which may be called “the role of a patient” (Parsons, 1978). Basically, after a cancer surgery, people who receive more social support can more often be relieved of most of their daily duties by close relatives, which may result in decreased PA. This study has shown that the significance of social support for PA changes depending on the period of measurement. Therefore, a systemic approach to health-related behaviors that aims to improve self-managing behavior (Hawkins et al., 2010) is needed. It means that it is necessary in the perioperative period to instruct caregivers about the importance of gradual increase in PA, necessity to expand the range of self-service activities. It is also necessary to involve a rehabilitator in the perioperative process. It may be claimed that social support should include a specified type of health-related behavior (e.g., social support for undertaking PA, social support for reducing alcohol intake) and the period over which the study is carried out (before the surgery, after the surgery). Additionally, support and self-efficacy are mediators between cancer symptoms and physical activity. This is consistent with studies by Morey et al., who has shown that self-efficacy is a predictor in performing endurance exercise (Morey et al., 2015). Lee et al. (2018) have shown that colon cancer patients are more likely to exercise if they receive social support from family and friends. The division of sports activities into sports and recreational activities and those related to household duties showed that patients

who received greater social support before the surgery more often followed medical recommendations to undertake walking, cycling and gymnastics. The results indicate that after the surgery, patients are not mobilized to do their daily home assignments. Therefore, it is likely that the household members worry about the convalescence of the patients and do not want to burden them additionally and relieve them of their daily housework.

Before the surgery, the patients who lived alone showed a lower amount of time devoted to PA than patients who lived in partnership. This tendency corresponds to the findings of Hawkins et al. (2010), who has proved that becoming widowed, divorced or separated contributes to decreasing the amount of time devoted to PA (Hawkins et al., 2010). However, a reversed relationship was seen half a year after the surgery: PA of people who lived alone was higher than people in partnership. It may be explained by the fact that people who live alone are forced to undertake more PA in everyday life than people who are assisted by a partner. This dependence confirms the discussed relationship between social support and the increase in PA (Chen et al., 2018).

The success of cancer treatment depends on external factors (e.g., the selection of an appropriate method of treatment, the selection and care of medical staff) and on the patient (e.g., health behaviors, social support). Although the patient's role in self-determination and self-management in illness is crucial, there are various factors that determine the extent to which patients are aware of this. Entering the "role of a patient" somewhat involves the need to modify one's own identity, internalizing those aspects of life that were previously unknown. Illness is a situation that does not only affect the patient, but often requires a reformulation of the life of the entire family system. The role of social support in illness discussed in this article is complex. Therefore, it is worth looking at theories that can explain the obtained correlations.

According to the Seligman's learned helplessness theory (1974), an organism that has come to terms with its inability to control the situation will react in three ways: motivational deficit, cognitive deficit, and emotional deficit. The motivational deficit appears secondary to the belief that there is no control over the situation, and its effect is to refrain from attempting to change. The cognitive deficit is synonymous with the belief that nothing can be done to prevent unpleasant situations. It means that future efforts will prove futile anyway. This expected lack of self-effectiveness is associated with negative self-assessment and a reinforced sense of one's own worthlessness. Such thinking leads to the patient developing a passive or indifferent attitude. It results in attempts to take over some of the daily duties by the closest relatives to help relieve the patient (Seligman, 1974). As mentioned earlier, people facing the illness on their own tend to be more active. Presumably, people without social support in a crisis situation may want to seek such support. Such an infer-

ence would explain the amount of time devoted to PA. Leaving home, for example, for a walk, a bike ride, or a trip to the store, may give the patient a greater chance of meeting someone with whom they might share their concerns. People who are provided with support in their immediate surroundings would not see the need to acquire new contacts, benefitting from a safe and familiar social environment. On the other hand, the patient's family members and relatives might assume the role of "the protector" to make them feel appreciated, important and responsible for the patient's life and health. A similar situation applies to medical staff, who might feel the need to fulfill their professional duties.

This study has confirmed the positive role of self-efficacy for PA before surgery. It confirms the studies by Morey and associates (Morey et al., 2015) and Dennis and associates (Dennis et al., 2013). It has been shown that self-efficacy did not correlate with PA six months after the surgery. The experienced cancer symptoms proved especially important for changing this behavior six months after the surgery. The patients' appraisal of symptoms as troublesome did not favor undertaking PA (symptoms explain the 13% variability in PA). It is noteworthy that such medical variables as the type of surgery, using stoma, and adjuvant treatment were not significant predictors of PA.

The study results can contribute to the development of education programs for medical staff who work with patients as well as for patients and their families. It seems important to educate them about the necessity of patients' own activity while struggling with an illness. In the light of these studies it is reasonable to monitor health behaviors not only at hospital, but also outside the medical facility.

CONCLUSIONS

1. It has been shown that social support and cancer symptoms are important for shaping PA before colorectal cancer surgery and six months after the surgery.

2. After colorectal cancer surgery, patients living alone had higher levels of PA than patients with colorectal cancer living in a partnership.

3. After colorectal cancer surgery social support may lead patients to believe that they do not need to make any physical effort because caregivers take care of their daily responsibilities. This situation will not be conducive to proper amount of time devoted to PA, necessary for the course of postoperative recovery.

4. Six month after colorectal cancer surgery the variable concerning the patient's somatic state (symptoms) has been shown as the largest part of the variance in PA.

Therefore, postoperative quality of medical care is important to eliminate pain symptoms.

LIMITATIONS AND PRACTICAL IMPLEMENTATION

The present paper relied on the patients' self-reported assessment of PA, and therefore, a subjective representation of health behaviors was obtained. In replicating the study, it would be worthwhile to apply objective methods, for example, the use of an accelerometer (Strath et al., 2005). The study was conducted in only one facility and other variables such as mood, pain and quality of life were not controlled. In this study, social support was understood as instrumental support and interest in the patient's situation. It is advisable that in future studies the support should be operationalized as aid in shaping PA.

Despite these limitations, the results of this study may have practical implications. The most important thing—in our opinion—is to supplement deliberations on the influence of social support on the time devoted to PA by colorectal cancer patients with empirically documented input. The results may contribute to designing educational programs for medical staff members who remain in direct contact with patients and may have direct influence on their health-related behaviors, as well as for the patients themselves and their families.

CRedit Author Statement

JAROSŁAW OCALEWSKI (65%): conceptualization, methodology, formal analysis, investigation, resources, data curation, writing (original draft), project administration, funding acquisition.

PATRYCJA MICHALSKA (20%): investigation, writing (original draft).

PAWEŁ IZDEBSKI (15%): conceptualization, methodology, writing (review).

REFERENCES

- Backman, M., Wengström, Y., Johansson, B., Sköldengen, I., Börjesson, S., Tärnbro, S., & Berglund, Å. (2014). A randomized pilot study with daily walking during adjuvant chemotherapy for patients with breast and colorectal cancer. *Acta Oncologica*, 53(4), 510–520. <https://doi.org/10.3109/0284186X.2013.873820>
- Barberan-Garcia, A., Ubré, M., Roca, J., Lacy, A. M., Burgos, F., Risco, R., Momblán, D., Balust, J., Blanco, I., & Martínez-Pallí, G. (2018). Personalised prehabilitation in high-risk patients undergoing elective major abdominal surgery: A randomized blinded controlled trial. *Annals of Surgery*, 267(1), 50–56. <https://doi.org/10.1097/SLA.0000000000002293>
- Broadbent, E., Petrie, K. J., Main, J., & Weinman, J. (2006). The Brief Illness Perception Questionnaire. *Journal of Psychosomatic Research*, 60(6), 631–637. <https://doi.org/10.1016/j.jpsychores.2005.10.020>
- Carli, F., Charlebois, P., Stein, B., Feldman, L., Zavorsky, G., Kim, D. J., Scott, S., & Mayo, N. E. (2010). Randomized clinical trial of prehabilitation in colorectal surgery. *British Journal of Surgery*, 97(8), 1187–1197. <https://doi.org/10.1002/bjs.7102>
- Chen, Y.-C., Chang, L.-C., Liu, C.-Y., Ho, Y.-F., Weng, S.-C., & Tsai, T.-I. (2018). The roles of social support and health literacy in self-management among patients with chronic kidney disease. *Journal of Nursing Scholarship*, 50(3), 265–275. <https://doi.org/10.1111/jnu.12377>
- Dalgaard, O. S. (1996). Community health profile as tool for psychiatric prevention. In D. R. Trent & C. A. Reed (Eds.), *Promotion of mental health* (Vol. 5, pp. 681–695). Avebury.
- Dennis, D. L., Waring, J. L., Payeur, N., Cosby, C., & Daudt, H. (2013). Making lifestyle changes after colorectal cancer: Insights for program development. *Current Oncology*, 20(6), e493–e511. <https://doi.org/10.3747/co.20.1514>
- Faleschini, S., Millar, L., Rifas-Shiman, S. L., Skouteris, H., Hivert, M.-F., & Oken, E. (2019). Women’s perceived social support: Associations with postpartum weight retention, health behaviors and depressive symptoms. *BMC Women’s Health*, 19(1), 143. <https://doi.org/10.1186/s12905-019-0839-6>
- Fujisawa, D., Umezawa, S., Basaki-Tange, A., Fujimori, M., & Miyashita, M. (2014). Smoking status, service use and associated factors among Japanese cancer survivors—A web-based survey. *Supportive Care in Cancer*, 22(12), 3125–3134. <https://doi.org/10.1007/s00520-014-2284-2>
- Gallant, M. P. (2016). The influence of social support on chronic illness self-management: A review and directions for research. *Health Education & Behavior*. <https://doi.org/10.1177/1090198102251030>
- Hawkins, N. A., Smith, T., Zhao, L., Rodriguez, J., Berkowitz, Z., & Stein, K. D. (2010). Health-related behavior change after cancer: Results of the American Cancer Society’s studies of cancer survivors (SCS). *Journal of Cancer Survivorship*, 4(1), 20–32. <https://doi.org/10.1007/s11764-009-0104-3>
- Krouse, R., S. (2010). Gastrointestinal Cancer. In J. C. Holland, W. Breitbart, P. Jacobsen, M. Lederberg, M. Loscalzo, & R. McCorkle (Eds.), *Psycho-Oncology* (pp. 140–143). Oxford University Press.
- Law, E., Levesque, J. V., Lambert, S., & Girgis, A. (2018). The “sphere of care”: A qualitative study of colorectal cancer patient and caregiver experiences of support within the cancer treatment setting. *PLoS One*, 13(12), e0209436. <https://doi.org/10.1371/journal.pone.0209436>
- Lee, M. K., Park, S. Y., & Choi, G.-S. (2018). Association of support from family and friends with self-leadership for making long-term lifestyle changes in patients with colorectal cancer. *European Journal of Cancer Care*, 27(3), e12846. <https://doi.org/10.1111/ecc.12846>
- Lindström, D., Sadr Azodi, O., Wladis, A., Tønnesen, H., Linder, S., Näsell, H., Ponzer, S., & Adami, J. (2008). Effects of a perioperative smoking cessation intervention on postoperative com-

- plications: A randomized trial. *Annals of Surgery*, 248(5), 739–745. <https://doi.org/10.1097/SLA.0b013e3181889d0d>
- McDonough, M. H., Beselt, L. J., Daun, J. T., Shank, J., Culos-Reed, S. N., Kronlund, L. J., & Bridel, W. (2019). The role of social support in physical activity for cancer survivors: A systematic review. *Psycho-Oncology*, 28(10), 1945–1958. <https://doi.org/10.1002/pon.5171>
- Melzer, H. (2003). Development of a common instrument for mental health. In A. Nosikov & C. Gudex (Eds.), *EUROHIS: Developing Common Instruments for Health Surveys* (pp. 35–60). IOS Press.
- Morey, M. C., Blair, C. K., Sloane, R., Cohen, H. J., Snyder, D. C., & Demark-Wahnefried, W. (2015). Group trajectory analysis helps to identify older cancer survivors who benefit from distance-based lifestyle interventions. *Cancer*, 121(24), 4433–4440. <https://doi.org/10.1002/cncr.29684>
- Parsons, T. (1978). *Action Theory and the Human Condition*. Free Press.
- Possmark, S., Berglind, D., Sellberg, F., Ghaderi, A., & Persson, M. (2019). To be or not to be active—a matter of attitudes and social support? Women’s perceptions of physical activity five years after Roux-en-Y Gastric Bypass surgery. *International Journal of Qualitative Studies on Health and Well-Being*, 14(1), 1612704. <https://doi.org/10.1080/17482631.2019.1612704>
- Schwarzer, R., & Jerusalem, M. (1992). Self-efficacy as a resource factor in stress appraisal processes. In R. Schwarzer (Ed.), *Self-efficacy: Thought control of action* (pp. 217–242). Hemisphere.
- Schwarzer, R., Luszczynska, A., Ziegelmann, J. P., Scholz, U., & Lippke, S. (2008). Social-cognitive predictors of physical exercise adherence: Three longitudinal studies in rehabilitation. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association*, 27(1S), S54–63. [https://doi.org/10.1037/0278-6133.27.1\(Suppl.\).S54](https://doi.org/10.1037/0278-6133.27.1(Suppl.).S54)
- Seligman, M. (1974). Depression and learned helplessness. In Friedman & Katz (Eds.), *The psychology of depression: Contemporary theory and research*. John Wiley & Sons.
- Stephenson, L. E., Bebb, D. G., Reimer, R. A., & Culos-Reed, S. N. (2009). Physical activity and diet behaviour in colorectal cancer patients receiving chemotherapy: Associations with quality of life. *BMC Gastroenterology*, 9(1), 60. <https://doi.org/10.1186/1471-230X-9-60>
- Strath, S. J., Brage, S., & Ekelund, U. (2005). Integration of physiological and accelerometer data to improve physical activity assessment. *Medicine and Science in Sports and Exercise*, 37(11 Suppl.), S563–571. <https://doi.org/10.1249/01.mss.0000185650.68232.3f>
- Wong, M., Looney, E., Michaels, J., Palesh, O., & Koopman, C. (2006). A preliminary study of peritraumatic dissociation, social support, and coping in relation to posttraumatic stress symptoms for a parent’s cancer. *Psycho-Oncology*, 15(12), 1093–1098. <https://doi.org/10.1002/pon.1041>