The role of occupational-participation, meaningful-activity and quality-of-life of colorectal cancer survivors: findings from path-modelling

Siew Yim Loh, Musaropah Sapihis, Mahmoud Danaee & Yan Piaw Chua

To cite this article: Siew Yim Loh, Musaropah Sapihis, Mahmoud Danaee & Yan Piaw Chua (2020): The role of occupational-participation, meaningful-activity and quality-of-life of colorectal cancer survivors: findings from path-modelling, Disability and Rehabilitation, DOI: 10.1080/09638288.2020.1715492

To link to this article: https://doi.org/10.1080/09638288.2020.1715492

Published online: 21 Jan 2020.

Article views: 5

View related articles

View Crossmark data
The role of occupational-participation, meaningful-activity and quality-of-life of colorectal cancer survivors: findings from path-modelling

Siew Yim Loh\textsuperscript{a}, Musaropah Sapihis\textsuperscript{b}, Mahmoud Danaeec and Yan Piaw Chuad

\textsuperscript{a}Department of Rehabilitation Medicine, Faculty of Medicine, University Malaya, Kuala Lumpur, Malaysia; \textsuperscript{b}Allied Health Sciences College, Sungai Buluh, Ministry of Health, Kuala Lumpur, Malaysia; \textsuperscript{c}Department of Social Preventive Medicine, Faculty of Medicine, University Malaya, Kuala Lumpur, Malaysia; \textsuperscript{d}Institute of Educational Leadership, Faculty of Education, University of Malaya, Kuala Lumpur, Malaysia

ABSTRACT

Purpose: This novel study aims to explore the relationship between occupational participation, meaningful-activity, and the health-related quality of life of people living with a diagnosis of colorectal cancer.

Methods: A cross-sectional study design with 113 colorectal cancer survivors (from two large public hospitals in Malaysia) was conducted. Data collection tools included the Occupational Participation Questionnaire, Engagement in Meaningful-activities, and the European Organization for Research and Treatment in Cancer Quality of Life (QOL) Questionnaire. Data analyses were conducted using SmartPLS to examine path analyses between the three measures.

Results: There were independent significant relationships between (1) occupational participation, and (2) meaningful activity engagements on the dependent variable of QOL in this cohort of cancer survivors. More importantly, the result showed that “meaningful-activity” positively and significantly mediates the path between occupational participation and quality of life \( [\beta = 0.250 (0.46^*0.59), p < 0.001] \).

Conclusions: Engagement in meaningful activity mediates the occupational participation of a cohort of colorectal survivors, and produces an impact on their quality of life. This study demonstrates that “occupational participation” (an important construct in occupational therapy), has the potential to improve colorectal cancer survivors’ quality of lives. Therefore, the role of occupational therapists must be optimized within the oncology team, to improve occupational participation and patients’ abilities to engage in meaningful activities for better quality of life.

IMPLICATIONS FOR REHABILITATION

- Occupational therapy intervention addresses the needs of people of all ages, who encountered limitations in their daily occupational participations.
- Cancer can have significant impact on occupational performance, and occupational therapy can improve these limitations to improve their Quality of Life.
- Occupational therapy should be a vital part in the cancer survivorship treatment plan for it can significantly improve occupational performance and quality of life of cancer survivors.

Introduction

The incidence of colorectal cancer in Malaysia is 21.3 cases per 100,000 people. Colorectal cancer is the most common cancer in Malaysian males and the second most common in Malaysian females\textsuperscript{[1]}. The rise is attributed to the aging population since colorectal cancer increases dramatically after the age of 50 years\textsuperscript{[1,2]}. However, the incidences are reported to be rising in younger people and this may be contributed to by the increase in sedentary lifestyle and diet currently prevalent\textsuperscript{[2]}. Nevertheless, earlier detection, better awareness, and a greater access to better treatment have also contributed to many patients living past five years\textsuperscript{[3]}. Living indefinitely with cancer also means that the survivors have to manage and deal with a range of deficits or limitations related to physical, cognitive, psychosocial, sensory functioning, and other aspects of performance that may be impaired from the prolonged treatment\textsuperscript{[4,5]}. This creates a survivorship phenomenon which is a public health concern where the interface between “aging-cancer-dysfunctions” has resulted in activity disruptions, role disengagement, limitations in activity participation\textsuperscript{[6-8]}, and created detrimental impacts on the survivors’ quality of life. This calls for even greater involvement from all relevant professionals-including the roles of occupational therapy to address occupational participation in order to enhance the quality of lives of the increasing population of cancer survivors.

Occupational therapy addresses these limitations in daily activity participation, in order to improve survivors’ functional abilities and to enable them to resume their occupational roles productively\textsuperscript{[9,10]}. By focusing on enabling an individual’s participation in their chosen everyday activities, occupational therapists become an integral member of the cancer treatment team, enabling cancer patients whether they are in the inpatient hospital setting, outpatient clinics, and, in the community. Occupational therapy addresses the physical, cognitive, psychosocial, sensory, and other aspects of performance in a variety of contexts to support engagement in everyday life activities that affect health, well-being, and quality of life\textsuperscript{[11]}. This concept of “occupational
"participation" refers to the process of enabling the involvement in everyday life; whereas, "participation-restrictions" refer to the barriers experienced during daily activities [11]. These key constructs are outcome measures in occupational therapy and occupational science [12–14]. The individual’s occupation-centred perspective strongly influences their choices and goals, and is known to be a significant determinant of successful rehabilitation [15,16].

Occupational participation after colorectal cancer is assessed by occupational therapists, using patient-reported outcome measures [17,18]. There is empirical evidence supporting the positive relationship between occupational participation and health, in non-oncology patients such as brain-injured [19,20], stroke [21–23], stress-related disorders or musculoskeletal pain and with community-dwelling older adults [24]. A systematic review by Stav et al. [24] found positive associations between occupational-participation and improved health. There are also emerging, but inconclusive findings, from studies on occupational participation, using the International Classification of Functioning (ICF) framework and/or models of occupational therapy practice [11,25,26].

Other studies have provided evidence on the significant relationships between meaningful-activity engagement [27,28], fulfilling basic psychological needs that contribute toward meaning in life, among older adults with and without disabilities [28,29]. Pergolotti et al. [30] concluded that occupational participation is strongly associated with meaningfulness of activity in older adults living with a cancer diagnosis. However, research focusing on activity-participation, and quality of life for cancer survivors is limited [31–34]. In addition, the underlying mechanisms that influence activity participation for better quality of life is a developing science, and the associations between these constructs (i.e., occupational participation, meaningfulness of activity and quality of life) are grossly lacking.

Therefore, this study aims to: (1) identify the limitations in occupational participation as perceived by colorectal cancer survivors, and (2) examine the path analyses of a model of hypothesized relationships between the study constructs (i.e., occupational-participations, meaningful-activity and quality of life). Specifically, the theory underpinning this study is our proposed hypothesis underlying the study (see Figure 1), informed by the International Classification of Functioning, Disability and Health model (ICF) framework [9] and the occupational perspective from the field of occupational therapy [25,35,36]. Analyses performed were guided by the hypothesis that the survivors’ perceived quality of life is positively associated with the occupational participation and their engagement of meaningful activity in their daily living after a cancer diagnosis. This study will specifically examine the relationship between “meaningful-activity” [26,37,38] and “occupational-participation” with their overall quality of life.

Methodology
Design
Ethical approvals were applied from two governing bodies [University Malaya/MEC: 201311-0508 and Ministry of Health of Malaysia/NMMR 13-1525-18789]. This study was designed as a two phase cross-sectional design–psychometric validation of tools (Phase 1–33 cancer survivors for reliability and expert panel for validity) and survey on 113 colorectal patients (Phase 2). Data were collected from two large specialist hospitals with specialised colorectal cancer care services. Figure 2 present the flow chart of the study.

Subjects
Adults with a confirmed diagnosis of Colorectal Cancer and fulfilling the eligibility criteria of: (1) diagnosed within the past one year, (2) age 18 and above, (3) having no recurrences, and, (4) having no psychiatric condition (that interferes with participation) were approached for consent. They were recruited based on the hospital databases of patients who are due for follow-up visit at the surgical outpatient clinics at the two large medical hospitals. Our sample size calculation based on G*Power software version 3.2 [39], stipulated a minimum of 107 patients in order to attain a significant linear regression relationships between variables corresponding to medium effect sizes and a statistical power of 0.80 at p ≤ 0.05 [40].

Data collection
Data were collected sequentially. First, the medical records were reviewed to confirm the diagnosis, treatment and stage of the disease during diagnosis, time since diagnosis and primary tumour site. Those who fulfilled the study’s inclusion criteria were approached for informed consent. Individuals who gave their

---

**Figure 1. Theoretical hypotheses for path modelling.**

H1 = Occupational Participation → Engagement in Meaningful Activity

H2 = Engagement in Meaningful Activity → Quality of Life

H3 = Engagement in Meaningful Activity → Functional-Symptoms

H4 = Occupational Participation (+ Meaningful Activity) → Quality of Life

IADL= Instrumental Activities of Daily Living.
OP= Occupational Participation.
QOL= Quality Of Life. MA= Meaningful Activity.
OPQ-M = Occupational Participation Questionnaire-malay version.
EMAS-M = Engagement in Meaningful Activity, malay version.
consent received a questionnaire package, comprising of a information sheet (to inform about the study) and the three main tools. These three tools provided the seven study variables [(1) Occupational participation, (2) Instrumental Activity of daily living, (3) Social activities, (4) Leisure activities, (5) Work, (6) Meaningful activity and (7) Quality of life]. The three outcome measures are described below.

**Occupational participation**

Occupational Participation was measured using the 19 item Malay Occupational participation questionnaire. The items from this tool were taken from the Occupational Gaps Questionnaire [41], which has 29 items relating to individuals’ participation on a range of daily activities/occupations. Occupational Gaps Questionnaire (OGQ) measures perceived occupational gaps (when an individual cannot participate in a desired occupation) [42,43]. The OGQ has two questions – (a) Do you perform the activity? and (b.i) If you do, are you satisfied? (b.ii) If you don’t, are you satisfied?. These key questions were designed to measure any gap in their performance.

The Malay Occupational Participation Measure was developed from the Occupational Gaps Questionnaire (OGQ). As we were interested in the level of participation of colorectal survivors in daily occupations, we took all the items in the OGQ with our key question (i.e., Do you perform the activity?). If the answer is “yes”, they then rate the statement using a Likert scale from one to five (1 = very low, 2 = low, 3 = moderate, 4 = high, 5 = very high) to indicates the level/intensity of engagement. We had conducted the validation process on the tool [44], starting with a forward-backward translation of all the items from the Occupational Gaps Questionnaire. A 6-member expert panel reviewed the content, and, individually assessed the item-content-validity index (I-CVI) independently (I-CVI ranged between 83.3 to 100%). Next, a confirmatory factor analyses was conducted, and, 10 items were dropped due to low factor loading values. The final 19 items, spread across four domains of IADL (6 items), work (3 items), leisure (4 items) and social (6 items) was accepted as the validated Malay OPM [44]. Table 1 showed the items from the confirmatory factor analyses using AMOS. This final 19-item measure was used for the phase two study (see Figure 1).
A test-retest reliability check using 33 cancer survivors of mixed cancer, were conducted on the tool. The psychometric findings on test-retest at 7–12days apart, showed good reliability coefficient (ICC = 0.72–0.96, and good internal consistency reliability for IADL (0.91), leisure (0.89), social (0.94) and work (0.88) [44].

**Engagement in meaningful activities survey (EMAS)**

Engagement in Meaningful Activities survey (EMAS) [31]. This is a uni-dimensional tool developed as a 12-items scale, with five-point rating to indicate level of engagement [1-never, 2-rarely, 3-sometimes, 4-usually, and 5-always]. It measures the activity’s congruity with one’s value system or subjective meaning for a particular activity [27–29,45]. This tool was backward and forward translated by two independent bilingual expert panel, who then meet for a consensus agreement of a Malay version (EMAS-M). The 12 items were then piloted (n = 33 survivors) for reliability and validity. The findings were published [44] - as high correlations for each item (0.35 and 0.89), and a test-retest reliability Cronbach’s alpha value of 0.90.

**EORTC-QLQ C30 for quality of life**

EORTC QLQ-C30 is a generic QoL questionnaire designed to assess important domains of functioning (e.g., physical, emotional, role) and cancer symptoms (e.g., fatigue, pain, nausea/vomiting, appetite loss) [46]. The published Malay translation version of EORTC-QLQ C30 [45] was reported with good internal good internal consistency (Cronbach’s alpha value at 0.5–0.99 for all subscales), and Intraclass correlation coefficient (ICC) values were 0.91 (Global Health Status); 0.17 (Physical Functioning); 0.83 (Role Functioning); 0.99 (Emotional Functioning); 0.96 (Cognitive Functioning); 0.05 (Social Functioning) while for symptom domain, they ranged from 0.13 to 1.00 [47].

**Data analyses**

SmartPLS version 3.2 [48] was used to analyse the data for more robust structural equation analyses even from less data distributions and a smaller sample size. Path analysis method (an extension of multiple regression) was conducted in a two-step analysis approach--(i) Step 1 involves examining the measurement model (validity and reliability of the constructs), followed by, (ii) step 2: a structural model to examine the path co-efficient (β), the determination of co-efficient (R²) and the predictive relevance (Q²) of each independent variable of the dependent variables. Finally, a mediator analysis using bootstrapping procedure was executed [35]. PLS is robust even with smaller sample size because it applies a bootstrapping method (5000 resamples) for determining the significance level of the loadings, weights and path coefficient, and also utilizing blindfolding procedure to derive the predictive relevance (Q²) and the effect sizes (f²) of the model. Data analysis using a path analysis methodology [37], on this explorative study will consider the variables being studied for their relative strength of associations with quality of life, as the final outcome measure.

**Results**

**Socio-demographic characteristics**

A total of 152 consented participants were recruited-collected from 91 patients at the University of Malaya Medical Centre and 61 patients at the Selayang Hospital in Kuala Lumpur, Malaysia. Only 113 participants completed the questionnaires, giving a response rate of 74.3 percent. The mean age of the survivors was 64.7 (SD = 3.49) years, of which 91 (80.5%) patients were 65 years old or older. There were 60 female and 53 males (53% versus 47%). They were mostly married (86.7%), unemployed or housewives (68 or 80.2%), had primary or secondary education (77/152 or 68.1%), followed by Malay (n = 22/152 or 20.4%), Indian (n = 11/152 or 9.7%) and others (n = 2/152 or 1.8%). They were mostly married (86.7%), unemployed or housewives (n = 68 or 80.2%), had primary or secondary education (>85%), and had a household income of between 216.71 and 650.11 Euros (57.5 %).

**Clinical characteristics**

Of the 113 colorectal cancer participants, most were colon cancer (60.2%) with 39.8 percent rectal cancer. The majority (82.2%) had stage II-III cancer. Their average duration of post-treatment period was 4.27 (SD = 3.49) years, of which 91 (80.5%) patients were
between one to five years, post-treatment. Majority of them (67.3%) had chemotherapy, had radiotherapy treatment (55.8%), did not have stoma (63.7%) at the time of assessment and had at least one to two comorbidities (61.1%).

**Participants reporting restrictions in occupational participation**

After more than a year of completion of treatment, many colorectal cancer survivors are found to still experience limitation in activities, particularly related to return to work [full or part-time, 70% participants], performing volunteering work (51.3% participants), leisure [sport participation (40.7% participants)] and/or social [travelling for pleasure (34.5% participants)]. In addition, limitations in instrumental daily living skill were still reported, although these restrictions are less [i.e., cooking/preparing meals (only 23.0%) and doing laundry (only 20.4%)].

**Results from path analyses**

**Evaluation of the measurement model**

Path analyses method of measurement yield both the reflective and the formative constructs [49]. Our initial step was to test the reflective construct. This involved the examination of the convergence validity of the data, by utilizing the factor loadings of the indicators, average variance extracted (AVE) and composite reliability (CR). We then test the indicators’ reliability by checking the main loading and cross loading of indicators, and we found nineteen items below the cut-off value of 0.62 loadings, informed by the recommended cut-off value by Chin [50]. We found the CR (composite reliability) values of the constructs were good, since they ranged from 0.77 to 0.96 – or exceeding the recommended threshold value of 0.70 with (AVE) cut-off value at 0.5 [51].

Our second step was to test the discriminant validity, which was to compare the correlations between constructs and the squared root of the average variance extracted for these constructs [51]. We found acceptable discriminant validity index (see Table 2). Therefore, we concluded that these findings showed that all the latent variables were different from each other (which is a requirement before more testing are to be conducted [51]).

Our third step involved validating the formative measures, and multicollinearity between indicators were tested with variance inflation factors (VIF) values of above five [51]. Table 2, presents the weights and respective t-values for the indicators of these formative constructs in the model. We found that most of the indicators were significant (p < 0.05) – except for instrumental activities of daily living [cooking/preparing meal p < 1.06]), leisure activities [reading newspapers/news/magazines, p < 1.16], social activities [visiting relatives/friends, p < 0.74; helping and supporting others p < 0.21].

In subsequent analysis, we retained these indicators to ensure breadth of coverage for capturing the meaning of the key construct as suggested by Hair, Ringle and Sarstedt [52]. The variance inflation factors (VIF) scores were tested and found to be below the threshold value of five, confirming that multicollinearity was not a concern in this study. Our analyses found that the assessed indicators and the constructs showed satisfactory levels of reliability, internal consistency and discriminant validity, which support the adequacy of the measurement model. Thus, we concluded having a satisfactory measurement model, which then allowed us to proceed to the next test on the structural equation analyses to determine its explanatory power and to test the research hypothesis.

**Evaluation of the structural model**

Figure 3 shows the result of the path coefficient (β) and the coefficient of determination (R² value). The R² value for QoL construct is 0.44 which means 44 percent of the changes in quality of life is due to the occupational participation and meaningful activity in the model. This R² value of 0.44 for QoL construct was higher than the value of 0.25 (weak), but smaller than 0.50 (medium) as suggested by Cohen [51]. We examined the model’s predictive relevance by calculating the Q² indexes of QoL, and found the result of Q² = 0.31 which exceeded the recommended threshold value (Q² > 0), indicating medium to large predictive relevance (values of 0.02, 0.15 and 0.35 for small, medium and large) [53] for the QoL construct.

The structural model was assessed by exploring change in R² to see whether the impact of a particular latent variable on perceived health quality of life has substantive impact. The effect sizes f² were calculated using the equation below [52]:

\[ f^2 = R^2_{\text{included}} - R^2_{\text{excluded}} / 1R^2_{\text{included}} \]

where: R² included and R² excluded are R² provided on dependent variables when the predictor latent variable is used or omitted in the structural equation respectively. The effect of a predictor latent variable is small at the structural level if f² is 0.02, medium if f² is 0.15 and large if f² is 0.35 (Cohen [54]).

Table 3 refers to the inference on the f² estimate for the six independent latent variables. We found occupational participation has a small effect size on the perceived quality of life while perceived engagement in meaningful activity was found to have medium-to-large effect sizes. The implication from the findings is that occupational therapists must consider both the meaningfulness of selected activity (as medium of intervention) and the occupational participations of survivors when designing intervention to improve quality of life of colorectal cancer survivors.

Table 4 shows the results of the validation of the path of structural model, with a summary of the path results and the corresponding t values and estimated p value associated with each t value. The significance of the path coefficients (β) was tested by checking the significance of the t value. For all of the paths, a two-tailed t test was used. The association of the exact p values and t values of each path coefficient were also estimated, using the bootstrap function with 5000 resamples. Table 4 shows that six out of seven paths had significant relationships. The path linking occupational participation to meaningful activity (H2) was positive and statistically significant, and the path linking meaningful activity to quality of life (H3) was also positive and statistically significant. The hypotheses H1a, H1b, H1c and H1d as shown in Figure 1 (path linking IADL, leisure, social and work to occupational participation) were all positive and significant. Our findings showed that the proposed hypotheses were supported, at the conventional significant level of p ≤ 0.05.

**Result for mediation test**

Using the analytical approach described by Preacher and Hayes [55], the path model (Figure 4) for relationship between occupational participation and QoL, was statistically significant (β = 0.417, p < 0.001). With an overall model of R² at 0.174, this indicates that occupational participation accounted for only 17.4 percent of the variance in QoL. However, after adjusting the indirect effects of the mediator, the direct effect of occupational participation on QoL was no longer significant (β = 0.118, p < 0.05). While these results suggest a full mediation scenario according to [56], more recent research on statistics suggests the importance of
examining the indirect effects separately, given that the total effect is not necessary for mediation to occur [57].

Thus, on meticulous examination, we found that the bootstrap-estimate showed a significant indirect effect ($b = 0.250$, $t$-value $= 3.91$) between Occupational-participation to the Quality of life (QoL), but with Meaningful-activity as a mediator. As indicated by Preacher and Hayes [55], the indirect effect of 0.250, (95% confident Interval between 0.116 and 0.365, (0.46 0.59)
does not straddle a zero in between, and thus, would indicate that there is a mediation. We illustrated this important finding in Figure 4, clearly depicting that the occupational-participation of these colorectal cancer survivors was positively related to engagement in meaningful-activity, which in turn was significantly related to quality-of-life (QoL).

**Discussion**

This study utilised the path-analyses method with an aim to examine the complex interrelationship between occupational participation, meaningful activity and health quality of life in a cohort of colorectal cancer survivors. Our findings showed that about 44 percent of the changes in the perceived quality of life index of colorectal cancer survivors.
The survivors were attributed to six latent variables in the model. These variables were (1) Occupational participation, (2) Instrumental activities of daily living (IADL), (3) Leisure, (4) Social, (5) Work and (6) Meaningful activity. However, only the paths between meaningful activity, IADL, leisure, social, work with QOL were statistically significant \( (p < 0.05) \). The findings showed that the higher the emphasis that the colorectal cancer survivors held about the meaningfulness of activity, the higher their perceived QoL would result. Similarly, higher perceived participation (in IADL, leisure, social and work) was positively associated with higher QoL. These findings provide evidence that the model’s predictive relevance \( (Q^2) \) is adequate to the QoL construct, even though it is a small effect size. The implication from this study is that the findings on engagement of meaningful activities as a mediator between occupational participation, and QOL is novel. It contributes to the emerging new evidence on the role (and levels) of meaningfulness of activities, the engagement in occupational participation domains, and their positive influences towards improving QOL in cancer populations. The findings provided some evidence to support the findings of previous work on occupational participation among non-oncology patients \([24,27–29]\) and oncology patients \([7–10]\).

The key significant finding from our study was that the relationship between occupational participation and QoL, was significantly mediated by “meaningfulness of activity” in this cohort of people living with colorectal cancer. It emphasised that the significant pathway of engagement in occupation participation, was enhanced by the level of meaningfulness (of activity), and which subsequently contribute toward better quality of life. In summary, occupational participation is an important outcome measure which has a potent and positive influence on quality of life, and this relationship can be further improved, if the activities engaged by the survivors, were also perceived as meaningful. This result is in line with Ekman’s works \([27–29]\) on occupational participation, where they demonstrated that meaningful activity can have a mediation effect on quality of life of the cancer survivors.

At more than a year of completion of active treatment, 70 percent of these colorectal cancer survivors still experienced barriers to return-to-work, 51 percent were still unable to perform volunteering work, 41 percent still have limitations with leisure activities [sport participation] and, 35 percent reported limitations in social activities [travelling for pleasure]. Thus, an important implication from this study finding, is that, the need for the involvement of occupational therapy services within the survivorship care plan is critically needed. The Survivorship Care Plan (SCP), an individualised care plan that includes guidelines for monitoring and maintaining a patient’s health as they move beyond their cancer treatment, should include offering occupational therapy as a formal strategy for improving the concept of multidisciplinary team based care. Therefore, this strategy of developing and advocating for a SCP itself can increase the referral to, and use of, occupational therapy with this population. It should inform policies to optimise occupational therapists’ unique and holistic contribution in cancer care \([9]\), where their role in designing individual and community intervention programs, can empower and enhance the QOL of cancer survivors who are living indefinitely and longer after completion of active treatment \([58]\).

Occupational therapists are integral members of the cancer team, with a special focus on enabling an individual’s participation in chosen everyday activities, working with cancer patients in the inpatient hospital setting, hospital outpatient clinics and in the community \([59]\). Profiling the baseline and reassessment records on occupational participations, as a clinical outcome measure, can inform the planning of a therapeutic survivorship care plan (SCP?). Thus, we recommend that survivorship plan should include assessment of occupational participation, and meaningful activity measures, as well as, client-centred interventions to support patients to increase engagement in meaningful activities. This is also needed in community activities to promote better health of survivors, and to encourage more meaningful social participation to prevent recurrences and promote cancer control for survivors in their respective community.

### Strength and limitations

Cross-sectional data has limitations in drawing causal inferences associations between occupational participation, meaningful activity and quality of life and also restricted their directionality. However, the use of path analysis allows a rigorous analysis, in this limited-evidence area. Future studies should consider the use of standardised clinical measure (e.g., Karnofsky Performance Status tool), to examine concurrent validity and to objectively rate cancer patients’ functional performance. Future research should also examine the directionality of these key occupational therapy constructs in more depth and in the various subgroup of cancer survivors (type of cancer/comorbidities/age/occupational status/mental health status etc) is needed to understand the significant role they play to improve the health, wellbeing and QOL of cancer survivors. In addition, qualitative studies (using focus groups or in depth interviews) on survivors and caregivers can help strengthen therapists’ understanding of what enable patients’ occupational functioning status, to improve Quality of life after cancer. Finally, more studies should be conducted on how occupational therapists can better partner and contribute in the acute or chronic/community survivorship care contexts and to explore the potential means to improve QOL of cancer population.

### Conclusion

Occupational participation and meaningful activity as outcome tools are potential measures for health and quality of life of cancer survivors. These concepts are the special focus for

<table>
<thead>
<tr>
<th>Path</th>
<th>Path coefficients (β)</th>
<th>t-value</th>
<th>Sig</th>
<th>90% confidence intervals</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: OP → QoL</td>
<td>0.142</td>
<td>1.62</td>
<td>0.105</td>
<td>[0.03;0.32]</td>
<td>Not supported</td>
</tr>
<tr>
<td>H1a: IADL → OP</td>
<td>0.316</td>
<td>10.55</td>
<td>0.001*</td>
<td>[0.26;0.37]</td>
<td>Supported</td>
</tr>
<tr>
<td>H1b: Leisure → OP</td>
<td>0.207</td>
<td>9.49</td>
<td>0.001*</td>
<td>[0.17;0.25]</td>
<td>Supported</td>
</tr>
<tr>
<td>H1c: Social → OP</td>
<td>0.394</td>
<td>14.83</td>
<td>0.001*</td>
<td>[0.34;0.44]</td>
<td>Supported</td>
</tr>
<tr>
<td>H1d: Work → OP</td>
<td>0.319</td>
<td>11.50</td>
<td>0.001*</td>
<td>[0.26;0.37]</td>
<td>Supported</td>
</tr>
<tr>
<td>H2: OP → MA</td>
<td>0.456</td>
<td>5.37</td>
<td>0.001*</td>
<td>[0.26;0.57]</td>
<td>Supported</td>
</tr>
<tr>
<td>H3: MA → QOL</td>
<td>0.588</td>
<td>7.30</td>
<td>0.001*</td>
<td>[0.41;0.72]</td>
<td>Supported</td>
</tr>
</tbody>
</table>


*p < 0.001, Critical t-value > 1.65 significant level = 10%.
occupational therapists’ intervention to improve quality of life. This study using “path analysis models” has provided the empirical evidence that meaningfulness of activity has significantly mediated the occupational participations of people living with a colorectal cancer diagnosis, and consequently, contributes towards a positive influence on their quality of life. These constructs are a key focus in the field of occupational therapy and have important implication in the research, education and clinical practice sectors for the emerging field of cancer survivorship. The role of Occupational therapists which include assessing and improving occupational participations in people living with a cancer diagnosis, should be optimised to improve QOL in the rising number of cancer survivors.

Living with cancer indefinitely in the community also means survivors must continue to be informed about cancer surveillance to avoid recurrence, symptoms management, managing the interfaces between aging/comorbidities, but also to participate in health-promotion activities. Interdisciplinary onco-occupational therapy has a significant role to play in improving the quality of life of people living with colorectal cancer.

Acknowledgements

The authors thank all participants for their time given to the project. Thanks Dr Gail Boniface for checking the language of the manuscript.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

[28] Eakman AM. A prospective longitudinal study testing relationships between meaningful activities, basic


