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Which self-management strategies do health care professionals recommend to their cancer patients? An experimental investigation of patient age and treatment phase

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Abstract This vignette based study aimed to examine recommendations of health care professionals (HCPs) in promoting self-management strategies to cancer patients. Nine-hundred-forty-two physicians and nurses were asked to (1) indicate if they would recommend self-management strategies to a vignette cancer patient, and (2) to specify those in an open format. Vignettes included a manipulation of patient age (60 vs. 75 years) and treatment phase (currently treated versus treatment completed). Six categories emerged through coding a total of 2303 recommendations: physical activity (71.8%), nutrition (64.3%), psychological support (36.7%), medical support (29.2%), conscious living (17.2%) and naturopathy (12.3%). While psychological support was particularly recommended during treatment, physical activity was more frequently recommended after completion of treatment. Results suggest that HCPs recommend a variety of self-management strategies besides standard medical treatment. Patient's treatment phase and age seem to partly influence recommendation behavior, potentially indicating insecurities regarding acute treatment situations and age-related stereotypes.

Keywords Cancer · Health care professionals · Perceived control · Physical activity · Self-management · Vignette study

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Introduction

Cancer patients use various strategies to actively deal with their disease and its often accompanying physical, psychological and social burdens (Brearley et al., 2011). Self-management has become a popular term to describe these supportive strategies and it has been recognized as an important part of disease management (Lorig & Holman, 2003). Commonly used self-management strategies are physical activity, nutrition, complementary alternative medicine (CAM) and psychological support (Gansler et al., 2008; Horneber et al., 2012; Shneerson et al., 2014). In a study comparing uptake rates of different self-management strategies among cancer survivors, highest frequencies (84%) were observed for the engagement in physical activity (Shneerson et al., 2014).

HCPs, namely physicians and oncology nurses, play a key role in recommending self-management strategies to cancer patients, as they represent a resource of support for self-management behavior (Glasgow et al., 2000). Cancer patients report the wish for a "holistic advice" (Boger et al., 2015, p. 15) by their HCPs, including self-management and life-style changes (Cheng et al., 2018; McGowan et al., 2013; Rogers et al., 2009). In their conceptual model of a self-management cycle, McCorkle et al. (2011) state that HCPs are a basic component in the patient-provider partnership or for mutually determining care plans. Supporting this conceptual work, empirical studies in different populations show that HCPs' recommendations are associated with patients' self-management behavior (e.g. de

Melo Ghisi et al., 2014; Morrison et al., 2012; Park et al., 2008): for example, an oncologist's recommendation to exercise resulted in increased patients' physical activity levels (Jones et al., 2004).

However, little is known about the extent to which HCPs address various self-management strategies during their routine communication with their patients. In a survey among 874 cancer survivors, 59% stated that a physician discussed strategies to improve health, 59% reported a discussion about exercise, 44% reported a discussion about diet and 24% no discussion on health promotion at all (Kenzik et al., 2016). Compared to literature on recommending general self-management strategies, there are more studies focusing especially on physical activity (Jones et al., 2005; Karvinen et al., 2010; Nyrop et al., 2016). For example, when oncologists were surveyed (N = 199), 64% stated to address physical activity on at least some visits (Karvinen et al., 2010).

Evidence for varying recommendation rates by HCP characteristics or patient characteristics is limited and partly inconsistent: a survey among cancer survivors revealed that discussions about self-management strategies varied by survivors' characteristics such as age, education or comorbidities (Kenzik et al., 2016). For example, participants above 65 years were less likely to report discussions about diet or general strategies to improve health. With regard to physical activity, surveys among physicians observed effects of HCP characteristics such as HCPs' age, specialty or sex (Jones et al., 2005; Karvinen et al., 2010; Spellman et al., 2013). However, another study using electronic health records did not confirm these results, but found an increased likelihood for physical activity communication for older patients (Nyrop et al., 2016). Additionally, HCPs might have reservations to recommend some self-management strategies during acute cancer treatment (Haussmann et al., 2018), but—to our knowledge—the role of treatment phase has not been investigated yet.

In addition to demographic characteristics of patients and HCPs, psychological variables, such as illness perceptions (Leventhal et al., 2016), may have the potential to explain differences in HCPs' recommendation behavior to cancer patients. One prominent aspect of illness perceptions is the amount of control patients perceive to have over their disease (Leventhal et al., 1980; Moss-Morris et al., 2002). There is some evidence that survivors perceiving to have a high amount of control over their illness are more likely to adopt a healthy lifestyle with regard to physical activity, diet, stress management, sleep patterns, and use CAM and support groups more frequently (Charlier et al., 2012; Grande et al., 2006; Henderson & Donatelle, 2003; Park et al., 2008). As patients' perceived control seem to influence their use of self-management strategies, HCPs' own perceptions of the amount of control that patients have over the course of their disease might also be relevant. To our knowledge, it has not been investigated so far whether HCPs' recommendations of self-management strategies are influenced by their own perceptions of patient's control over their cancer.

The present study: objective and expectations

The aim of this study was to explore HCPs' recommendations with regard to self-management strategies among cancer patients. Using a vignette of a typical patient with either breast, colorectal, or prostate cancer and a manipulation of patient age and treatment phase, we aimed to examine the influence of patient characteristics on HCPs' recommendations, combined with an investigation on the role of HCPs' demographic and occupational characteristics. Additionally, we expected that an integration of HCPs' perceptions of patient's control over their cancer can help to explain self-management recommendation rates.

Methods

The study is part of the Momentum Project Heidelberg on HCPs' recommendation behavior regarding self-management strategies among cancer patients (registration number NCT02678832). It consisted of a nation-wide cross-sectional survey among health care providers about self-management strategies. Eligible participants were general practitioners, gynecologists, gastroenterologists, urologists, surgeons, medical oncologists, radiation oncologists, and oncology nurses. An additional inclusion criterion was contact to patients with breast, prostate, or colon cancer on a regular basis.

An anonymous postal questionnaire was sent to hospitals and practices with an oncological treatment focus in all 16 federal states of Germany proportionately to its population size. Hospitals and practices were randomly selected from comprehensive official physician registers and databases. Additional recruitment strategies involved distribution at three medical congresses, advertisements in medical journals, and provision of an online version of the questionnaire on respective web pages and newsletters. Ethical approval for the study was obtained from the Ethics Review Board of the Faculty of Behavioral and Cultural Studies of Heidelberg University (AZSiev2015/1-1 and AZSiev2016/1-2). Written informed consent was obtained from all study participants and 25€ were offered as incentive.

Measures

Participants had to fill out a nine-page questionnaire about different self-management strategies for cancer patients

including mostly quantitative but also some qualitative elements. At the beginning of the questionnaire participants were instructed to think of cancer patients being diagnosed within the last 2 years when answering the items of the questionnaire. Additionally, they should think of patients who are currently during chemotherapy or radiotherapy or who have completed treatment only recently.

This manuscript focuses on the vignette which was placed at the beginning of the questionnaire (after sociodemographic variables). The online and paper pencil versions of the questionnaire were congruent and in both modes the four versions of the vignette (see below) were randomly assigned.

In the following analysis we used a mixed methods approach, as we combined standardized questionnaires with the qualitative analysis of open comments following the presentation of a short vignette. Standardized items on HCP characteristics included questions on age, sex, clinical specialization, years of practice, number of cancer patients treated per month, primarily treated tumor types, administered treatment types, and an estimate of the percentage of patients treated with curative or palliative intent in their everyday practice.

Vignettes and manipulation of patient characteristics

The vignette was developed based on a qualitative pretest among 30 HCPs (Haussmann et al., 2018), which has e.g. shown that patient age and treatment stadium are relevant factors regarding recommending physical activity. The final vignette was modified and approved by clinicians.

Prior to the presentation of the vignettes, HCPs were asked to select a typical patient (with breast, colorectal or prostate cancer) that best resembles their professional practice in a forced choice format. We called this item *cancer entity of vignette patient*. Afterwards, all vignettes asked HCPs to imagine that this patient underwent surgery, is a non-smoker, has a BMI of 25 and a stable general condition. In the vignette the patient asked them as physician/nurse, if he/she as a patient can do something in addition to medical treatment. We manipulated patient age (either 60 or 75 years old) and treatment phase (either currently treated with chemo and/or radiotherapy or completed chemo and/or radiotherapy 6 months ago) which resulted in four different vignettes that were randomly assigned to participants. Subsequently, HCPs should indicate if they recommend additional strategies to the vignette patient (yes/no) and were asked to provide written details of the advice in an open format.

HCPs' perception of patient's control

The personal control scale from a revised version of the Illness Perception Questionnaire (IPQ-R, Moss-Morris et al., 2002) was used to measure HCPs' perceived amount of control that patients have over the course of the disease. The IPQ-R has been adapted and validated for the use among HCPs (Arat et al., 2016). The four items of the personal control subscale, for example "What my patient does can determine whether his/her illness gets better or worse", were rated on a 5-point Likert scale from 1 ("strongly disagree") to 5 ("strongly agree") with Cronbach's $\alpha = .71$.

Data Analysis

In our mixed method approach, we combined qualitative thematic analysis with quantitative analyses. For the coding of HCPs' answers in the open text field following the vignettes, a predetermined coding scheme was used. Six independent raters assigned codes that were subsequently compared based on thematic analysis (Braun & Clarke, 2006). Differences between raters were solved after discussion and consensus. Codes were clustered into six main categories and a residual category (compare results section and Fig. 1) by assigning every qualitative category a quantitative value (1–7). Ten percent of the answers were categorized by two different raters in order to determine interrater reliability. Consensus rate for the six categories reached from $\kappa = 0.73$ (substantial consensus) to $\kappa = 1$ (almost perfect consensus).

Quantitative statistical analyses were performed using SPSS 24.0. In addition to descriptive statistics, we conducted Fisher's exact tests to identify significant differences in recommendations between manipulated factor levels. Multivariate logistic regression analyses with HCPs' recommendation rate as dependent variable were calculated for recommendation categories with significant differences in manipulated factors. Included main effects were vignette manipulations (method: forced entry), HCP characteristics (method: forced entry), HCPs' perception of patient's control (method: conditional with a significance level of $p < .10$), and interactions with manipulated factors (method: conditional with a significance level of $p < .10$).

Results

Participants

In total, 956 HCPs completed our survey, with 365 participants responding online and 591 returning the paper-and-pencil version (resulting in a response rate of 23%, as

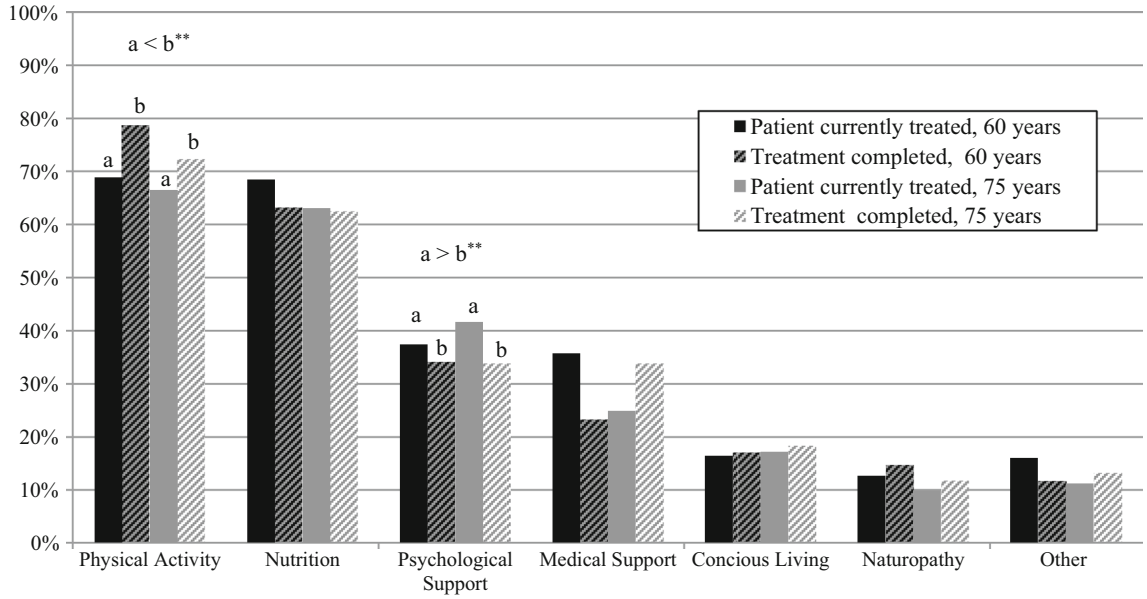

Fig. 1 Frequency of recommendations given by health care professionals by patient age and treatment stadium (manipulated factors). Significant differences in Fisher's exact test for physical activity (treatment completed > currently treated, $p < .01$) and for psychological support (currently treated > treatment completed, $p < .01$); marginally significant effect of patient age in the category physical activity (60 > 75 years, $p = .09$)

Table 1 Descriptive sample statistics ($N = 942$)

Variable	Mean ± SD or %
Age	43.13 ± 11.49
Sex	
Female	62.3%
Male	37.7%
Professional group	
Physicians oncology medical specialization	57.7%
Oncology nurses	42.3%
Employment at university/teaching hospital	50.4%
Number of years in practice	18.34 ± 11.01
Number of treated cancer patients/month	61.95 ± 71.27
Percentage of patients treated with curative intent	61.2%
Cancer entity of vignette patient[a]	
Breast	39.1%
Colorectal	43.9%
Prostate	17.0%
HCPs' perception of patient's control[b]	3.29 ± 0.67

SD Standard deviation, *HCPs* health care professionals

[a]HCPs were asked to select a typical patient that resembles their professional practice

[b]Subscale of the revised illness perception questionnaire (IPQ-R), range: 1–5

$N = 2.617$ HCPs received the paper-and-pencil questionnaire). Due to missing data 14 HCPs had to be excluded. Thus, our final sample consisted of 942 participants (57.7% physicians and 42.3% oncology nurses). Demographic and professional information is displayed in Table 1.

HCPs' recommendations of different self-management strategies

Of the 942 participants, 842 HCPs (89.4%) stated that they would provide recommendations in addition to medical treatment to the vignette patient. In total, HCPs mentioned 2303 recommendations in the open answer field ($M = 2.44$ recommendations per HCP). Clustering of the answers resulted in six main categories and a residual category (Fig. 1): physical activity (676 mentions: exercise, leisure time physical activity, supervised and therapeutic physical activity), nutrition (606 mentions: general dietary recommendations, dietary supplements), psychological support (346 mentions: psycho-therapy and counseling, unsupervised psychological methods/relaxation methods), medical support (275 mentions: follow-up care, rehabilitation, methods to alleviate side-effects), conscious living (162 mentions: leisure and recreational activities, social relations, routines in everyday-life and work), naturopathy (116 mentions: homeopathy, medicinal plants) and others (122 mentions). Looking at the frequencies, most HCPs recommended physical activity (71.8%) followed by nutrition (64.3%) and psychological support (36.7%).

Regarding these three main categories, differences between HCPs' specialties emerged: Fewer oncology nurses reported PA recommendations (65.3%) than specialized physicians (81.0%; $X^2 = 8.03$, $p = .005$) and general practitioners (74.6%; $X^2 = 13.198$, $p < .001$). Nutrition was most recommended by general physicians (74.1%) compared to specialized physicians (60.9%, $X^2 = 8.51$; $p = .004$) and nurses (63.8%; $X^2 = 5.33$; $p = .021$). And specialized physicians recommended psychological support less often (33.4%) compared to the other two groups (both $p < .01$).

Manipulated factors: patient age and treatment phase

HCPs gave more frequently a physical activity recommendation to a patient who had already completed treatment compared to a patient being currently treated ($p < .01$, Fig. 1). The manipulation of treatment phase was also significant for the category psychological support, but in the opposite direction: HCPs recommended psychological support more frequently during treatment ($p < .01$). Regarding age, HCPs recommended a 60-year old patient marginally more often to be physically active than a 75-year old patient ($p = .09$). For the remaining categories, no effects of the manipulated factors emerged.

Determinants of HCPs' physical activity recommendations

As the manipulation affected the recommendation frequencies in the two categories physical activity and psychological support, these variables were used as dependent variables in the following logistic regression analyses. The logistic regression explaining HCPs' recommendation of physical activity revealed significant main effects of HCP characteristics such as HCPs' sex and professional group (see Table 2). Additionally, strong evidence was found that HCPs who believed that their patients have high control over their disease were more likely to recommend physical activity (OR = 1.43; $p < .001$).

Of special interest were interactions between manipulated variables and HCP characteristics (Fig. 2, section A). A significant interaction term between cancer entity of vignette patient and treatment phase revealed that for patients with breast and prostate cancer, HCPs were more likely to recommend physical activity if treatment was completed than during treatment. A second, marginally significant interaction ($p = .053$) was found with respect to HCPs' sex and patient age: Among male HCPs, 75-year old vignette patients were less likely to receive a physical activity recommendation than 60-year old patients.

Determinants of HCPs' psychological support recommendations

The results of the logistic regression analysis explaining HCPs' recommendation of psychological support are described in the right column of Table 2. Significant interactions indicated that among male HCPs, 60-year old vignette patients were less likely to receive psychological recommendations than 75-year old patients (no difference among female HCPs). Further, for vignette patients with colorectal cancer, HCPs were less likely to recommend psychological support if treatment was completed than during treatment (Fig. 2, section B).

Discussion

In their review, McCorkle et al. (2011) stated: "The expectation for cancer patients to participate in their care and manage treatment effects between visits emerged as a demand that could no longer be ignored by oncology health care professionals" (p. 54). Accordingly, this study investigated what HCPs recommended to their cancer patients besides medical treatment. In a mixed method approach including a vignette, six main strategies were identified: physical activity, nutrition, psychological support, medical support, conscious living and naturopathy. Through

Table 2 Results of multivariate logistic regression analyses predicting HCPs' recommendations of physical activity and psychological support towards vignette patients

Variable	Physical activity			Psychological support		
	OR	95% CI	*p* value	OR	95% CI	*p* value
Manipulated factors within vignette						
Patient age						
60 years	Reference			Reference		
75 years	0.73	0.50–1.07	.103	1.01	0.73–1.41	.934
Patient treatment phase						
Currently treated	Reference			Reference		
Treatment completed 6 month ago	0.90	0.52–1.56	.705	0.53	0.31–0.90	.018
HCP characteristics						
Sex						
Female	Reference			Reference		
Male	0.53	0.35–0.82	.004	0.66	0.45–0.98	.040
Employed at university/teaching hospital						
No	Reference			Reference		
Yes	0.87	0.58–1.31	.505	1.08	0.74–1.55	.698
Number of years in practice	1.02	1.00–1.04	.061	0.98	0.97–0.99	.021
Professional group						
Physicians	Reference			Reference		
Oncology nurses	0.57	0.38–0.86	.008	1.30	0.88–1.92	.183
Number of treated cancer patients/month	1.00	0.99–1.00	.814	0.99	0.99–1.00	.382
Treatment focus (curative vs. palliative)						
Predominantly curative	Reference			Reference		
Predominantly palliative	0.81	0.52–1.27	.360	1.00	0.66–1.52	.993
HCP's perception of patient's control[a]	1.43	1.18–1.73	.000			
Cancer entity of vignette patient						
Breast	Reference			Reference		
Colorectal	0.28	0.10–0.80	.018	0.41	0.17–0.98	.046
Prostate	0.34	0.14–0.82	.017	0.39	0.19–0.78	.008
Interactions with manipulated factors						
Sex × patient age[b]	0.84	0.70–1.00	.053	1.22	1.04–1.44	.018
Cancer entity × treatment phase[b]						
Breast	Reference			Reference		
Colorectal	0.21	0.07–0.65	.006	0.29	0.11–0.74	.009
Prostate	1.71	0.76–3.88	.198	1.26	0.61–2.64	.533

Nagelkerke's R^2 = .12 (physical activity) and .08 (psychological support); *HCPs* health care professionals

[a]Subscale of the revised illness perception questionnaire (IPQ-R), range: 1–5; HCPs' perceived control was not included regarding recommendations of psychological support, as it did not have any bivariate association with the dependent variable (r = .02)

[b]Interaction is depicted in Fig. 2

manipulating patient age and treatment phase, it could be shown that these patient characteristics influenced HCPs' recommendations regarding physical activity and psychological support.

The strategies we found from the perspective of HCPs are partly congruent with patients' self-reports on self-management strategies. Similar to our study, in which physical activity and nutrition were the most frequent recommendations mentioned by about two-thirds of HCPs, physical activity and nutrition were also the self-management practices most frequently reported by cancer survivors (Shneerson et al., 2014). Psychological support, which was reported to be recommended by more than a third of HCPs in our study, was much less (7%) reported by patients (Shneerson et al., 2014). On the other hand, patients in the study by Shneerson et al. (2014) reported

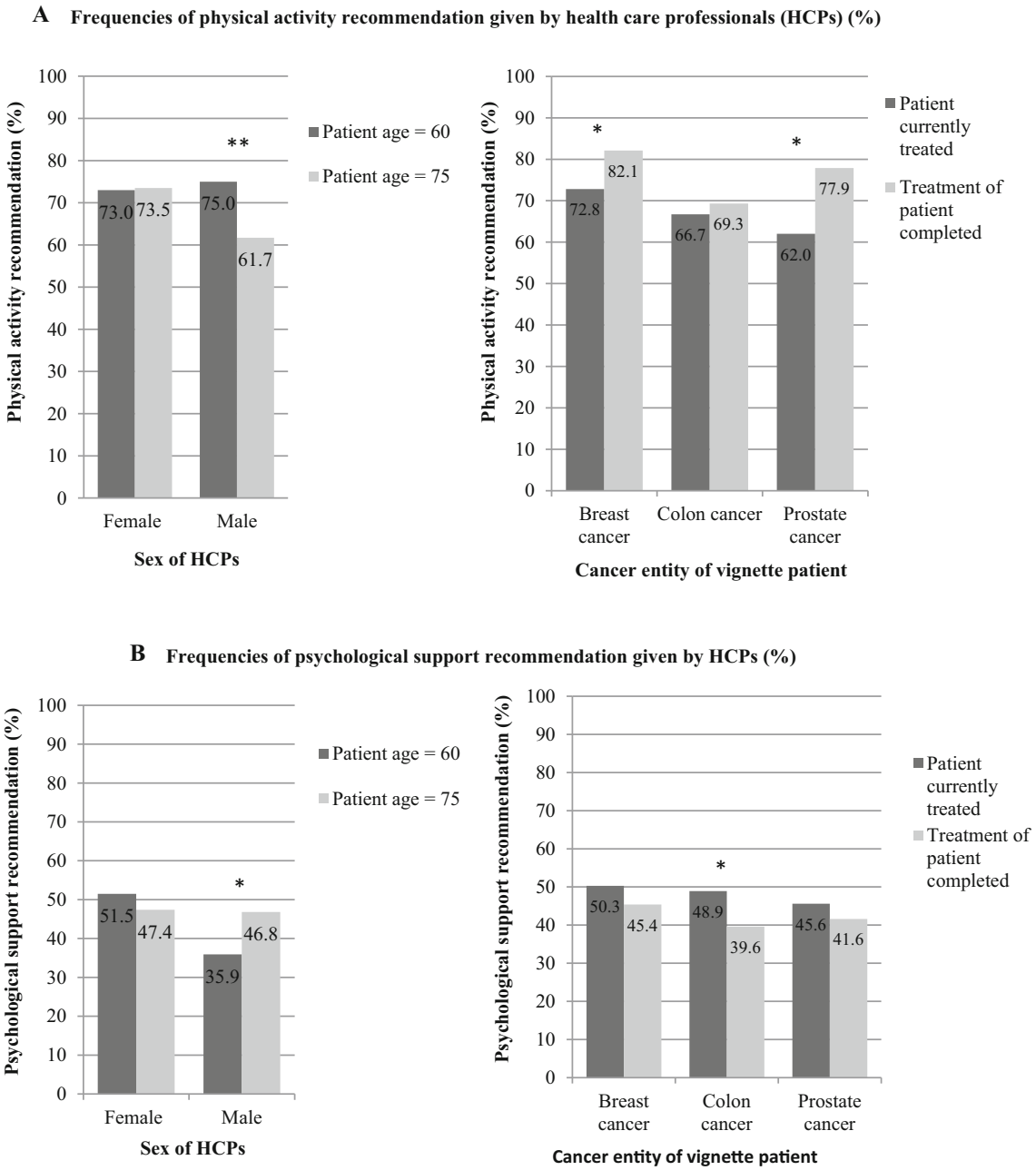

Fig. 2 Interactions regarding HCPs' recommendations of physical activity and psychological support due to manipulations of patient characteristics in the vignette. *$p < .05$; **$p < .01$

much more frequently to practice spirituality/religion (30%) and CAM (30%), which only a minority of HCPs recommended in our study. However, cultural differences (USA, UK or Germany) have to be kept in mind when interpreting these differences. Altogether, our vignette-based study suggests that HCPs recommend a variety of strategies besides standard medical treatment. Thereby they meet the wish of cancer patients for a holistic advice about life-style and self-management (Boger et al., 2015; Cheng et al., 2018; Rogers et al., 2009).

Our manipulation showed that HCPs partly gave different recommendations depending on whether a patient is currently under treatment or has already completed the treatment. Interestingly, treatment phase had an opposite

effect on the recommendation of physical activity and psychological support: While physical activity was more frequently recommended after the completion of the treatment (especially for breast and prostate cancer patients), psychological support was more frequently recommended during treatment (especially for colorectal cancer patients). This recommendation practice does not match the guidelines, as physical activity and psychological support are regarded both beneficial for cancer patients across the entire cancer continuum (Council of the European Union, 2008; Courneya & Friedenreich, 2007; Holland et al., 2011; Jones & Alfano, 2012; Schmitz et al., 2010).

Although it has been confirmed that physical activity is safe and beneficial during active cancer treatment, a study among rural breast cancer survivors has shown that having currently chemo-therapy was negatively related to wanting to receive counseling about physical activity (Vallance et al., 2013). Thus, when recommending physical activity less to patients during treatment, it does on the one hand not reflect guidelines, but it might—on the other hand—meet patients' preferences.

The reported interactions revealed a more differentiated picture for the manipulation of age. Overall, female HCPs recommended physical activity and psychological support more often. However, patient age was especially relevant among male HCPs. They recommended psychological support more frequently and physical activity less frequently towards older patients. Thus, especially male HCPs might be overcautious towards older patients. This corroborates the statements of older adults in qualitative focus groups, who reported negative or inadequate communication with their physician regarding physical activity (Costello et al., 2013). Negative images among HCPs, such as the believe that older patients are psychologically unbalanced and/or not capable to carry out physical activity, could affect patients' self-concept and be internalized, as postulated by the looking-glass self (Crocker & Quinn, 2000; Else-Quest et al., 2009) and the stereotype embodiment theory (Levy, 2009).

Additionally, it was found that HCPs who believed that their patients have a higher amount of control over the course of their cancer were more likely to recommend physical activity, whereas HCPs' perception of patients' control did not affect the recommendation of psychological support. Thus, physical activity might be viewed as a strategy patients can actively draw on to control their disease. However, previous research has shown that especially cancer patients with a low sense of control can profit from psychological support (Tamagawa et al., 2012). This effect of HCP-reported perceived control on HCPs recommendations of physical activity enhances previous literature which showed effects of patient-reported perceived control on patient's physical activity (Charlier et al., 2012).

There might be some uncertainties among physicians and nurses which self-management strategies to recommend to cancer patients (Haussmann et al., 2018). For example, in former days, cancer and old age were closely associated with inactivity and disability (Dimeo, 2010; Wood, 1971). Nowadays, physical activity guidelines recommend to engage in at least 150 min of moderate-to-vigorous physical activity per week for every age group and also during cancer treatment (Schmitz et al., 2010). It seems that this shift in paradigm has not totally consolidated in HCPs' minds (Ungar et al., under revision). When HCPs are (1) informed and convinced that self-management strategies are useful across the whole course of the disease and for every age group, and (2) express this towards their cancer patients, patients' self-efficacy can be increased to feel capable to practice the self-management strategies (Bandura, 2000).

Study limitations

The drawing on hypothetical vignettes needs to be discussed. The degree to which HCPs' responses following the vignette can be interpreted as accurate measures of their actual behavior is not clear. However, this method has been widely used in the investigation of medical choice and judgment (Banks et al., 2014; DeFrank et al., 2013). Additionally, the vignette approach allows manipulating patient characteristics experimentally.

We manipulated two patient characteristics (age and treatment phase) which we regarded most relevant (Jones et al., 2005; Karvinen et al., 2010; Nyrop et al., 2016; Spellman et al., 2013), but more patient factors might be of importance and hence should be investigated in future studies: e.g. sex of the patient, type of treatment, existence of metastases, side-effects, comorbidities etc. Additionally, a selection bias cannot be ruled out: HCPs who were especially interested in self-management strategies may have taken part in the study more frequently. Furthermore, as nurses were predominantly female, sex and profession were correlated in our study. Therefore, simple main effects of sex or profession need to be interpreted with caution, whereas the interaction effects in our multiple regression analyses are controlled for both variables.

Implications

Clinical implications can be drawn from our study to improve HCPs' recommendation behavior of self-management strategies. The HCP-patient relationship might be improved and intensified, if self-management strategies that are frequently practiced—such as CAM or religious/

spiritual practices (Shneerson et al., 2014)—were addressed more often during treatment consultation. There might be no scientific evidence for some of these strategies, but it is still important for HCPs to address the patient's needs on a holistic basis and avoid negative interactions between self-management strategies and standard medical treatment.

Furthermore, it would be beneficial for future research and practice, to understand how HCPs' advice is taken up by the patients and what consequences it has for their subsequent behavior and self-concept. At least for physical activity it was shown that respective recommendations by physicians were associated with higher physical activity levels of their patients (Jones et al., 2004; Tarasenko et al., 2017).

Patient characteristics, such as age and treatment phase, should optimally not determine HCPs' recommendation of physical activity and psychological support. HCPs might profit from informational resources to adapt their recommendations to recent guidelines. Only if practitioners are updated regarding recent research, this knowledge about self-management strategies can be transferred to patients and has the potential to increase their quality of life and health status.

Conclusion

This vignette-based study revealed that physicians and nurses seem to recommend a variety of self-management strategies besides standard medical treatment to cancer patients reaching from physical activity and nutrition to psychological support and conscious living. Thereby they meet the wish of cancer patients for a holistic advice. Patient's treatment phase and age seemed to influence if they recommend physical activity and psychological support. This possibly reflects a hindering negative image among some HCPs regarding physical activity during active treatment and among older patients as well as psychological support in the follow-up care and for younger patients. Informational resources might help to reduce insecurities among HCPs and thereby indirectly strengthen patients' self-efficacy in self-management practices.

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Compliance with ethical standards

Conflict of interest Nadine Ungar, Laura Schmidt, Martina Gabrian, Alexander Haussmann, Angeliki Tsiouris, Monika Sieverding, Karen Steindorf, and Joachim Wiskemann declares that they have no conflict of interest.

Human and animal rights and Informed consent All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

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