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Profiling Cancer Patients Based on Their Motives for Seeking Informational and Emotional Support Online

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ABSTRACT

Understanding why patients seek informational and/or emotional support online is fundamental to providing patients with accurate and reliable support that is tailored to their needs, preferences, and personal situation. Based on the stress and coping theory and uses and gratifications theory (UGT), this study aimed to identify theoretically-founded profiles of cancer patients differing in their motives for seeking informational and/or emotional support online, and to compare the profiles in terms of patients' psychological and background characteristics, and perception of health care services. Hierarchical cluster analysis was conducted, using questionnaire data from patients visiting a large Dutch health website ($N = 181$). This revealed three distinctive profiles, i.e., overall seekers ($n = 83$, 46.0%), occasional information seekers ($n = 83$, 46.0%), and contact exchangers ($n = 15$, 8.0%). Patients across these profiles differed in their eHealth literacy, with the contact exchangers being more eHealth literate than the overall seekers and occasional information seekers. The results can be used to create awareness among health care providers, web designers, and patient organizations on different types of cancer patients with different motives for seeking informational and/or emotional support online, and help them to tailor recommendations to and development of (online) sources that fit patients' needs. Future research could further investigate the integration of stress and coping theory with UGT by acknowledging the interplay of different coping strategies and different gratifications.

The internet is an important source of information and support for many patients (Carlsson, 2009; Van Eenbergen et al., 2020), often in combination with a health care provider consultation (Caiata-Zufferey et al., 2010; Lee & Lin, 2020). By engaging in so-called “convergence,” patients have become more active in managing their health (Haase et al., 2019; Mattsson et al., 2017). According to Kreps (2017), convergence is a process in which patients sequentially use multiple sources of information to fulfill their information and support needs. Patients can either use “information accessed through digital mass media and its subsequent discussion in interpersonal encounters” (type 1 convergence, p. 519) or “conduct interpersonal and peer discussions about health-related issues in virtual discussion spaces of various kinds” (type 2 convergence, p. 521). There are many reasons why patients engage in convergence. Generally, they use the internet for additional information to prepare for consultation or seek information beyond the consultation with their providers, to deal with conflicting information, or to connect with peers and receive and/or give emotional support on online platforms (Caiata-Zufferey et al., 2010; Dolce, 2011; Haase et al., 2019; Holmes, 2019; Maddock et al., 2011; Mattsson et al., 2017; Yli-uotila et al., 2013).

Cancer patients differ in the information and support they need and prefer (Ellis & Varner, 2018; Evans Webb et al., 2021; Mistry et al., 2010; Neumann et al., 2011), and accordingly, in their information and support-seeking behavior (Eheman

et al., 2009; Germeni & Schulz, 2014; Nagler et al., 2010; Protière et al., 2012). Research has indicated that cancer patients visit different online platforms to find different content which suggests they go online for different reasons (i.e., motives) to satisfy their needs (Chung, 2014; Haase et al., 2019; Sanders et al., 2020). Some patients seem predominantly to seek informational support to cope with their illness, while others seem mainly to seek emotional support (Caiata-Zufferey et al., 2010; Dolce, 2011; Maddock et al., 2011; Yli-uotila et al., 2013). An explanation for this variation can be found in the stress and coping theory which posits that individual factors influence how a person evaluates a stressor (e.g., cancer diagnosis) and coping possibilities (e.g., motives to use the internet), ultimately influencing what coping strategy they employ (Folkman, 2010; Lazarus & Folkman, 1984).

Earlier studies provided valuable insights into the motives for internet use among cancer patients in general (e.g., Haase et al., 2019; Holmes, 2019; Maddock et al., 2011; Mattsson et al., 2017; Yli-uotila et al., 2013), but did not account for individual differences in patients' motives for seeking different types of informational and/or emotional support online. When accounting for individual differences, previous research focused on how patients' psychological and background characteristics, and perception of health care services relate to the individual differences in support needs (e.g., Adamson et al., 2018; Ankem, 2006; Ellis & Varner, 2018; Griesser et al., 2011;

Matsuyama et al., 2013; Neumann et al., 2011) and internet use (de Frutos et al., 2020; Ehemann et al., 2009; Ginossar, 2016; Haase et al., 2019; Mattsson et al., 2017). To the best of our knowledge, no previous research has accounted for individual differences by exploring typical patient groups (or clusters). Therefore, information is lacking on whether there are individual differences in the motives of cancer patients for seeking informational and/or emotional support online, and if so, what factors relate to these differences in motives. Consequently, instead of taking a variable-oriented approach by looking at population-based correlations, this study looks at the response patterns of individual people. Understanding different patient groups based on the motives that cancer patients may have to go online is essential to provide patients with accurate and reliable (online) informational and emotional support (Blödt et al., 2018; de Frutos et al., 2020; McCaughan & McKenna, 2007) that is tailored to their personal situation, needs, and preferences. Tailoring (i.e., individualized communication; Hawkins et al., 2008) to the specific individual support needs of patients may improve the provision of (online) information and subsequently enhance coping with the illness by reducing patients' distress (Cutrona & Russell, 1990; Cutrona, 1990; Merluzzi et al., 2016). This study, therefore, focuses on (1) identifying typical patient profiles based on their motives for seeking informational and/or emotional support online, and (2) comparing these profiles in terms of patients' psychological and background characteristics, and perception of health care services.

Motives for using the internet

The uses and gratification theory (UGT) can be used to understand why people use the internet. According to this theory, people actively choose a medium based on its appropriateness to satisfy their needs (Stafford et al., 2004). There are three general types of gratifications that are unique to internet use: process, content, and social gratifications. Process gratifications concern the actual use of the medium (Cutler & Danowski, 1980) and refer to the satisfaction people experience from purposefully navigating online (Stafford et al., 2004). However, process gratifications can only partially explain why cancer patients use the internet because of the emphasis on the experience (Eysenbach, 2003; O'Reilly, 1996; Stafford et al., 2004).

Before discussing how the internet fulfills patients' content and social gratifications, it is important to understand the needs of patients. Research has shown that informational and emotional support are the two types of support most commonly sought and used by individuals coping with illness (Rains et al., 2015; Sanders et al., 2020; Van Eenbergen et al., 2018). According to the optimal matching model, patients need the proper type of support (informational and/or emotional support) that matches their needs to reduce stress and enhance coping with their illness (Cutrona & Russell, 1990; Cutrona & Suhr, 1992; Cutrona, 1990; Merluzzi et al., 2016). This means that patients actively seek out and choose communication channels they believe are appropriate to find the proper kind of support to fulfill their needs. Thus, content gratifications can explain why patients use the internet, namely to gratify their

need for informational support. Studies have shown that patients may search online to enhance the quality of the consultation and collaboration with their provider (Caiata-Zufferey et al., 2010; Haase et al., 2019; Yli-uotila et al., 2013). Patients use the information to prepare questions for their provider and to better understand their symptoms and worries, and medical jargon (Li et al., 2014; Yli-uotila et al., 2013). Consequently, patients may use the internet to search for informational support to complement the consultation and to understand what will or has been said (Caiata-Zufferey et al., 2010; Yli-uotila et al., 2013). Moreover, patients have been found to use the internet for a "second opinion" (Caiata-Zufferey et al., 2010; Haase et al., 2019). For instance, when they are in doubt about the quality or accuracy of the information given by the provider during the consultation (Bol et al., 2021; Caiata-Zufferey et al., 2010; Li et al., 2014).

Next to gratifying their need for informational support (i.e., content gratifications), patients can use the internet to gain social gratifications by seeking emotional support (Stafford et al., 2004). Patients try to lessen negative emotions caused by, for example, the diagnosis or implications of treatment by seeking emotional support from others (Faye et al., 2006; Lazarus & Folkman, 1984; Ziebland & Wyke, 2012). Many believe that only a fellow patient could understand their suffering, and consider online peer support, such as reading and sharing experiences, to be valuable, especially after diagnosis (Caiata-Zufferey et al., 2010; Maddock et al., 2011; Yli-uotila et al., 2013, 2014; Ziebland & Wyke, 2012). Considering the many different motives for seeking online, our first aim is to investigate typical patient profiles based on their motives for seeking informational and/or emotional support online. We propose the following research question (RQ):

RQ1: *Which patient profiles can be identified among cancer patients based on their motives for seeking informational and/or emotional support online?*

Differences in cancer patients and their motives for using the internet

The stress and coping theory explains why cancer patients differ in their motives for seeking informational and/or emotional support online (Folkman, 2010; Lazarus & Folkman, 1984). According to this theory, individual factors can influence patients' cognitive appraisal, i.e., the individual's judgment of a stressor, such as their diagnosis with cancer (i.e., primary appraisal), and the available coping options (i.e., secondary appraisal) which result in different patient coping strategies. Coping refers to the constantly changing cognitive and behavioral efforts of a person to deal with a stressful situation and is generally divided into problem-focused and emotion-focused coping (Lazarus & Folkman, 1984). Problem-focused coping is directed at solving or managing the stressful situation and includes seeking informational support (Carver et al., 1989; Lazarus & Folkman, 1984), which implies that a patient may use the internet to satisfy their needs through content gratifications (Stafford et al., 2004). Emotion-focused coping is directed at controlling or minimizing the emotions

associated with the stressful event and includes the expression of emotions or seeking emotional support (Carver et al., 1989; Folkman, 2010; Lazarus & Folkman, 1984), which implies that a patient may seek to satisfy their needs through social gratifications (Stafford et al., 2004).

Subgroups of cancer patients that seek informational and/or emotional support online may differ based on various individual characteristics. However, to the best of our knowledge, empirical evidence is lacking on how individual characteristics may vary across different patient subgroups that seek support online. In their review, Thomsen et al. (2010) found that differences in coping styles (problem-focused and emotion-focused coping) among cancer patients may be related to several factors, such as uncertainty, emotions, and control. Additionally, Franks and Roesch's (2006) meta-analysis indicated that moderator variables, such as age, may influence the relationship between an individual's appraisal of a stressor and their coping strategy. Indeed, patients' psychological (e.g., psychological distress, coping style) and background characteristics (e.g., age, gender, educational level, eHealth literacy), as well as patient's perception of health care services (e.g., trust in the physician) play a role in the behavior of patients seeking support online (e.g., Bell et al., 2011; de Frutos et al., 2020; Lalazaryan & Zare-Farashbandi, 2014; Li et al., 2014; Link et al., 2021; Nölke et al., 2015; Wang et al., 2020). Although the results of these previous studies are ambiguous, we expect that individual characteristics will vary across types of patients that seek support online.

Psychological factors

Whether patients seek informational and/or emotional support online may depend on an individual's level of psychological distress and coping style. There is evidence that higher levels of anxiety and stress relate to a higher need for information (Bell et al., 2011; Bol et al., 2020; Davison & Breckon, 2012; De Looper et al., 2021; Li et al., 2014). Consequently, a patient who searches for informational support online may demonstrate greater levels of distress (e.g., anxiety, cancer worry).

In contrast, seeking emotional support online can also be done to reduce higher cancer-related distress levels. Some studies, for instance, found that higher levels of distress are associated with the need for emotional support (Bender et al., 2021; Fujimori & Uchitomi, 2009; Van Weert et al., 2009). In terms of coping style, relationships with a so-called monitoring (i.e., information seeking) coping style are inconclusive, with findings of associations between a monitoring coping style and either informational (Bol et al., 2020; De Looper et al., 2021; Rood et al., 2015), emotional support (Michel et al., 2011; Timmermans et al., 2007), or both (Miller, 1995; Roussi & Miller, 2014).

Background characteristics

The use of the internet for informational and/or emotional support may also be explained by several background characteristics. In general, studies show informational support to be more likely sought online by younger patients than by older patients, as older patients seem to need, and desire, less

(detailed) information than younger patients. However, it has also been suggested that receiving emotional support online is valued more by younger patients than by older patients (Boudioni et al., 2001; Braun et al., 2019; Fujimori & Uchitomi, 2009; Squiers et al., 2005).

In addition, patients' online support-seeking behavior is related to an individual's education level. Patients who seek informational support online tend to have a higher level of education (Cotten & Gupta, 2004; De Looper et al., 2021; Myrick & Willoughby, 2019), as they seem to prefer more information compared to individuals with lower levels of education (Fujimori & Uchitomi, 2009; Squiers et al., 2005). Nevertheless, one study has shown that seeking informational support online is rather correlated with lower levels of educational attainment instead of higher levels, with less educated patients having higher needs for information (Matsuyama et al., 2011). However, other research suggests that seeking emotional support online is more likely done by patients with higher education levels (Fujimori & Uchitomi, 2009).

eHealth literacy is also another background characteristic that seems to be related to seeking informational and/or emotional support online. eHealth literacy refers to "the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem" (Norman & Skinner, 2006, p. e9). Patients seeking informational support on the internet seem to have higher (e)Health literacy than those not seeking informational support (Heiman et al., 2018; Li et al., 2014; Link et al., 2021). However, empirical evidence of a relation between eHealth literacy and emotional support seeking online is lacking.

Finally, informational support is suggested to be more likely sought by male patients than by women (Baumann et al., 2017; Bidmon & Terlutter, 2015; Clarke et al., 2006; Squiers et al., 2005). Numerous studies have shown that patients who seek emotional support online are more likely to be female (e.g., Beckjord et al., 2008; Boudioni et al., 2001; Clarke et al., 2006; Fujimori & Uchitomi, 2009; Koerten et al., 2011; Mcillmurray et al., 2001), because women tend to seek emotional support more proactively (Baumann et al., 2017; Bidmon & Terlutter, 2015; Yli-uotila et al., 2014).

Patients' perception of health care services

In addition to psychological and background factors, differences across different subgroups may also relate to patients' perception of health care services, such as trust in their physician. Many patients consider health care providers to be the most important source of informational support (Prestin et al., 2015; Shea-budgell et al., 2014; Van de Poll-Franse & Van Eenbergen, 2008; Van Eenbergen et al., 2020). Both seeking informational and emotional support are sought when patients are dissatisfied with, or mistrust the health care provider (Adamson et al., 2018). Compared to trusting patients, dissatisfied and mistrusting patients seem to seek informational support rather than emotional support (Bell et al., 2011; Li et al., 2014; Tustin, 2010).

Consequently, evidence of the influence of the different psychological and background characteristics, and patients' perception of health care services, is inconsistent. Therefore, the second

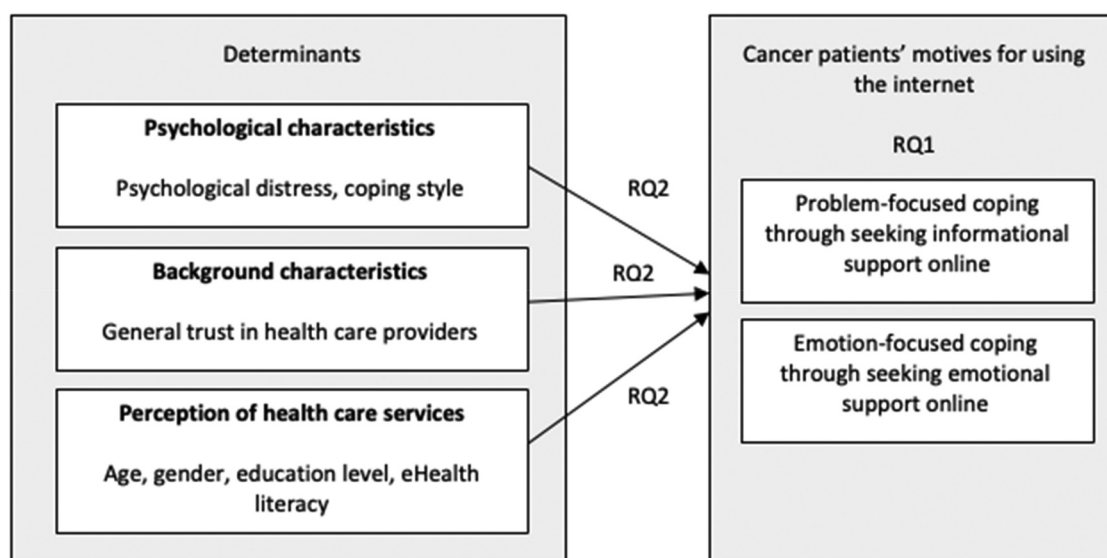


Figure 1. Conceptual model of cancer patients' motives for using the internet.

aim of this study is to investigate whether cancer patients who seek informational and/or emotional support online vary across different profiles based on individual characteristics. Figure 1 shows our conceptual model. We formulate the following RQ:

RQ2: *How do the patient profiles based on patients' motives for seeking informational and/or emotional support online differ in terms of their psychological and background characteristics, and patients' perception of health care services?*

Materials and methods

Participants and procedure

As a leader in Europe with the highest percentage of people that use the internet for health information-seeking, this study specifically focuses on the Netherlands (Centraal Bureau voor de Statistiek, 2019). The Dutch website Kanker.nl is one of the largest and best-known for cancer-related information, and offers both peer- (e.g., blogs, discussion groups) and expert-generated platforms (e.g., medical library, expert questions). The number of visits to the website is increasing, with 6,589,396 unique visitors in 2020 compared to 5,807,878 the year before (Stichting Kanker.nl, 2020). Between December 2019 and January 2020, a survey and informed consent were sent by Kanker.nl via e-mail to 1475 users of the website's online panel who consented to research on their user profile. To be eligible for the study, participants had to be either a current patient or cancer survivor, at least eighteen years old, and have sufficient command of the Dutch language. This study was approved by the Ethics Committee of the University of Amsterdam (reference number: 2019-PC-11494).

Motives for using the internet

Based on the results of the previous studies (Caiata-Zufferey et al., 2010; Haase et al., 2019; Maddock et al., 2011; Mattsson et al., 2017; Sanders et al., 2020; Yli-uotila et al., 2013), we

created twenty-two items to examine patients' motives for seeking informational and emotional support online, e.g., "Would you visit Kanker.nl if you have any questions after your conversation with your health care provider?," "Would you visit Kanker.nl if you want the experiences and advice from others?." To not overburden participants, items could be answered with dichotomous responses (yes or no). Based on our review of the literature, we grouped the items into three categories, ending up with six items in the "informational support: looking for complementary information" category, seven items in the "informational support: dealing with conflicting information" category, and nine items in the "emotional support: giving and/or receiving emotional support" category. Kuder Richardson Formula 20 (KR-20) was used to measure how consistent the reliability of the dichotomous scores on the motives was. One item (i.e., "Would you visit Kanker.nl if you want information about alternative treatments") decreased the reliability of the "looking for complementary information" category and was therefore deleted from the category for further analyses. A total score was calculated for each of the motive categories, resulting in "informational support: looking for complementary information" category (range 0–5), "informational support: dealing with conflicting information" category (range 0–7), and "emotional support: giving and/or receiving emotional support" category (range 0–9). This indicated that the higher the score, the more relevant the motive for a patient. Table 1 offers an overview of all items in the categories, including the Kuder Richardson-20 α measures.

Measures of factors associated with motives for using the internet

Psychological factors

Cancer-related psychological distress was measured with three concepts. First, to examine how patients react during dramatic life-changing events, such as the diagnosis of cancer, intrusive thinking was measured with the 7-item Impact of Events Scale (IES) (Horowitz et al., 1979), e.g., "I thought about the disease

Table 1. Motives for seeking informational and emotional support online.

Category	Motives (Would you visit Kanker.nl if you ...)
Informational support: Looking for complementary information (KR-20 α = .76)	... want to better understand what the health provider has told you? ... received too little information from your health provider? ... have any questions after your conversation with your health provider? ... want to reduce your uncertainties (e.g., about treatment, the future)? ... want to prepare for your conversation with your health provider?
Informational support: Dealing with conflicting information (KR-20 α = .76)	... have received conflicting information from different health providers? ... want to put the information that the health provider has told you into perspective? ... come across conflicting information on the Internet? ... have received conflicting information from your family and/or friends? ... want to check the information from the health provider? ... have received information that goes against your own opinion? ... want information that you did not want to discuss with your health provider during the conversation?
Emotional support: Receiving and/or giving emotional support (KR-20 α = .82)	... want to feel understood by others? ... want to have contact with fellow cancer patients? ... want information about the possibilities for contact with fellow cancer patients? ... want to share your current situation? ... want emotional support? ... want to share the information you have received from your health provider with others? ... want the experiences and advice of other patients? ... want to share your experience(s) with others (e.g., about treatment, consequences for your work?) ... want to participate in group conversations/group discussions?

Note. Reported Kuder Richardson-20 α concern reliability for each motive category after deleting the item "... want information about alternative treatments."

when I didn't mean to" assessed on a 4-point scale (0 = "not at all", 1 = "rarely", 2 = "sometimes", 3 = "often", Cronbach's α = .87). Second, worries about the disease were measured with an adapted 6-item Cancer Worry Scale (CWS; Custers et al., 2014), e.g., "During the last month, how often have you thought about your chances of getting cancer (again) or further expansion of the cancer?", with the same 4-point scale used (Cronbach's α = .90). The higher the score, the higher patients' distress. Last, a shortened Dutch version of the Intolerance of Uncertainty Scale (IUS) was used to assess patients' feelings of uncertainty, e.g., "Unforeseen events seriously upset me", using a 5-point scale (ranging from 1 = "strongly disagree" to 5 = "strongly agree", Cronbach's α = .88).

To measure patients' coping style, an adapted version of the shortened Threatening Medical Situation Inventory (TMSI) (Bronner et al., 2018; Miller, 1995). Participants indicated the extent to which statements applied to them after diagnosis with cancer, e.g., "I intended to read about my/the disease", with each item measured on a 5-point scale (1 = "not applicable at all" to 5 = "very applicable", Cronbach's α = .88). The higher the score, the more actively a patient searches for information to deal with their disease.

Background characteristics

Patients' background information was asked in terms of age, gender, education level, and eHealth literacy. Three categories were made for education level: low (i.e., primary education, lower vocational education, preparatory secondary vocational education, secondary general education), middle (i.e., higher secondary general education, pre-university education secondary vocational education), and high (i.e., higher vocational education, university).

Finally, eHealth literacy was measured with an adapted and shortened ten-item version of the Dutch Digital Health Instrument (Van der Vaart & Drossaert, 2017). Measures included information-seeking skills (e.g., "When searching for information

about the disease cancer on Kanker.nl, how difficult do you find it to choose from the information you find?"), information assessing skills (e.g., "When searching for information about the disease cancer on Kanker.nl, how difficult do you find it to determine the reliability of the information?"), information application skills (e.g., "When searching for information about the disease cancer on Kanker.nl, how difficult do you find it to determine whether the information found applies to you?"), and participants' navigation skills (e.g., "When searching for information about cancer on Kanker.nl, how often does it occur that you get confused on the website?"). Each of these skills was measured, using a 4-point scale (1 = "very easy" to 4 = "very difficult", Cronbach's α = .87) where higher scores indicated better digital health literacy skills.

Patients' perception of health care services

For patients' trust in health care providers, an adapted version of the Patient Trust in a Physician Scale was used (Dugan et al., 2005), e.g., "Sometimes physicians place their interest above the medical interest of a patient." For each of the five items participants indicated the extent to which it applied to them on a 5-point Likert scale (e.g., 1 = "strongly disagree" to 5 = "strongly agree", Cronbach's α = .86). Higher scores indicated a higher trust in physicians.

Statistical analysis

First, descriptive statistics were conducted to determine the characteristics of the sample. Agglomerative hierarchical cluster analysis was used to identify distinctive patient profiles with the motives for seeking informational and emotional support online as a clustering variable. The statistical method allows clustering of group cases in a way that all individuals within one cluster are similar to each other based on specific variables but significantly distinct from individuals in other clusters (Borgen & Barnet, 1987; Field, 2017a; Norufis, 2010). Hierarchical cluster analysis is explorative, allowing the

researcher to explore possible cluster solutions rather than having to pre-specify the number of clusters to determine the clustering of the data (e.g., *k*-means cluster analysis) ("Difference between K Means and Hierarchical Clustering," 2020; Field, 2017b; Na et al., 2010; Pai, 2021). Consequently, patients' motives were first standardized into z-scores to balance out the influence that uneven values of the motives categories could have on the clustering of the data (Milligan & Cooper, 1988; Nogueira & Munita, 2020; Schaffer & Green, 1996). Different amounts of individual motive items in each motive category could affect the cluster analysis and act as a weight when determining how to cluster the data (i.e., clustering algorithms such as Wards' Euclidean distances). Ward's clustering algorithm with squared Euclidean distance was used to join individuals into clusters to minimize variance within each cluster (Borgen & Barnet, 1987; Field, 2017a; Ward, 1963). Investigation of inversed scree plots, three random subsamples, and dendrograms led to a three- and four-cluster solution. Each profile was then scored on the three motive categories in comparison to the other clusters (i.e., high, moderate, low). Noteworthy is that this does not mean that a certain profile has a high, moderate, or low motivation in general, but that these scores are relative compared to the other clusters. To determine the appropriate cluster solution, both solutions were (visually) inspected for interpretability by looking at their representation. Finally, one-way analyses of variance (ANOVAs) with Welch and Games-Howell post hoc comparisons were conducted to compare the cluster solutions on the psychological and background characteristics, and patients' perceptions of health care services. To analyze all data IBM's SPSS software version 26 was used with a significance set at *p*-level .05 (IBM Corporation, 2019).

Results

Sample characteristics

A total of 211 participants responded to the invitation, of which 181 (85.8%) current (*n* = 90, 49.7%) and ex-patients (*n* = 91, 50.3%) completed the online survey. More than half of the participants were female (*n* = 94, 51.9%) and reported to have completed a high level of education (*n* = 97, 53.6%). Age ranged from 20 to 88 (*M* = 60.46, *SD* = 9.28). Breast cancer (*n* = 41, 22.7%) and urological cancers (*n* = 41, 22.7%) were the most common cancer diagnoses. Time since diagnosis ranged from two months to 331 months (*M* = 68.68, *SD* = 60.93). Of the 87 patients who still received treatment, 35 (40.2%) underwent curative treatment and 45 (51.7%) underwent palliative care (i.e., life extension and/or relief of pain). Characteristics of this sample are presented in Table 2.

Patient profiles according to motives

The hierarchical cluster analysis identified a three-cluster solution as the best theoretical fit. All clusters significantly differed from each other concerning the main motives for using Kanker.nl (*p* < .001; Table 3). We called the most active type of patients the *overall seekers* (*n* = 83). These patients reported

a high motivation to use the internet to look for complementary information (*M* = 4.25, *SD* = 1.10), to deal with conflicting information (*M* = 5.57, *SD* = 1.53), and to give and/or receive emotional support (*M* = 7.37, *SD* = 1.50). The second cluster is best referred to as the *occasional information seekers* (*n* = 83). Patients within this cluster were characterized by a moderate motivation to use Kanker.nl to look for complementary information (*M* = 3.36, *SD* = 1.43) as well as a moderate motivation to use the internet to deal with conflicting information (*M* = 3.93, *SD* = 1.60). This cluster had a low motivation to visit Kanker.nl to give and/or receive emotional support (*M* = 2.57, *SD* = 1.56). The *contact exchangers* (*n* = 15) were the least motivated to use Kanker.nl to find complementary information (*M* = 0.47, *SD* = 0.52) and deal with conflicting information (*M* = 0.33, *SD* = 0.49). In contrast to the other clusters, this group was reasonably motivated to give and/or receive emotional support on Kanker.nl (*M* = 5.60, *SD* = 1.76). A visualization of the three patient profiles is provided in Figure 2 and a comparison of the cluster composition based on the main motives is presented in Table 3.

To gain more insight into the profiles, we examined differences between the clusters on the item level of the motives. Several differences between clusters are considered noteworthy. Compared to the contact exchangers, the overall seekers and the occasional information seekers reported relatively higher motivation to visit Kanker.nl to better understand what the provider has told (respectively *p* < .001, mean diff. = .69; *p* = .001, mean diff. = .79), and when they received too little (respectively *p* < .001, mean diff. = .66; *p* < .001, mean diff. = .74) or conflicting information from the provider (respectively *p* < .001, mean diff. = .73; *p* < .001, mean diff. = .78). Moreover, in comparison to the occasional information seekers and the contact exchangers, the overall seekers also indicated to be relatively higher motivated to visit the website when they had uncertainties (respectively *p* < .001, mean diff. = .27; *p* < .001, mean diff. = .52), questions after consultation (respectively *p* = .001, mean diff. = .24, *p* < .001, mean diff. = .57), encountered information conflicting with their own opinion (respectively *p* = .001, mean diff. = .24; *p* < .001, mean diff. = .56), wanted to share their current situation (respectively *p* < .001; mean diff. = .74, *p* = .002, mean diff. = .47). In addition, compared to the overall seekers, the occasional information seekers and contact exchangers were relatively more motivated to visit Kanker.nl for contact with peers (respectively *p* < .001, mean diff. = .51; *p* < .001, mean diff. = .54), with the contact exchangers being the most motivated to engage in contact with peers. Finally, in comparison with the occasional information seekers and contact exchangers the only cluster that appeared to be relatively highly motivated to visit Kanker.nl to share their experience(s) with others were the overall seekers (respectively *p* < .001; mean diff. = .65, *p* = .022, mean diff. = .29). The differences among the clusters based on the items can be found in Table 4.

Differences across the patient profiles

Apart from the significant differences found in the different motives for online information and/or emotional support-

Table 2. Sample characteristics.

Variable	Current patients and cancer survivors N = 181
Age (at time of survey), <i>M</i> (<i>SD</i>), range	60.46 (9.28), 20–88
<50 years, <i>n</i> (%)	25 (13.8)
51–60	60 (33.1)
61–70	75 (41.4)
>71	21 (11.6)
Gender, <i>n</i> (%)	
Female	94 (51.9)
Male	87 (48.1)
Education, <i>n</i> (%)	
Low education level	23 (12.7)
Middle education level	61 (33.7)
High education level	97 (53.6)
Living situation, <i>n</i> (%)	
Alone	40 (22.1)
With Partner	105 (58.0)
With Partner and child(ren)	31 (17.1)
With Child(ren)	2 (1.1)
With Other family members (e.g., parent, brother/sister)	1 (0.6)
Other	2 (1.1)
Type of cancer diagnosis ^a , <i>n</i> (%)	
Breast cancer	41 (22.7)
Stomach, liver or colon cancer, incl. esophageal, rectum, pancreatic, and thyroid cancer	25 (12.8)
Lung cancer	13 (13.8)
Gynecological cancer (e.g., cervical, ovarian, and vulva cancer)	9 (5.0)
Blood or lymph node cancer (e.g., Hodgkin's disease, non-Hodgkin, leukemia)	15 (8.3)
Urological cancer (e.g., kidney, prostate, bladder, testicular cancer)	41 (22.7)
Head and neck cancer, brain cancer (e.g., mouth or throat, retinal cancer)	11 (6.1)
Skin cancer (e.g., melanoma)	6 (3.3)
Bone cancer, incl. multiple myeloma, Waldenstrom's disease	7 (3.9)
Other	28 (15.5)
Ongoing treatment, <i>n</i> (%)	
Yes	87 (48.1)
Goal of ongoing treatment, <i>n</i> (%)	
Curing	35 (40.2)
Sedative and/or palliative	45 (51.7)
I don't know	7 (8.0)
Time since diagnosis (at time of survey), <i>M</i> (<i>SD</i>), range ^b	68.68 (60.93), 2–331
0–12 months, <i>n</i> (%)	17 (11.5)
13–24 months	22 (14.9)
24–36 months	19 (12.8)
37–48 months	12 (8.1)
49–60 months	14 (9.5)
More than 61 months	64 (43.2)

Note. ^aMultiple answers possible. ^b Missing data for 33 participants.

Table 3. Scoring of the three clusters on the three motive categories.

Motive category	Cluster 1 (<i>n</i> = 83) The overall seekers	Cluster 2 (<i>n</i> = 83) The occasional information seekers	Cluster 3 (<i>n</i> = 15) The contact exchangers	<i>F</i> (2,178)
Informational support: Looking for complementary information, (<i>M</i> , <i>SD</i>), range	High (<i>M</i> = 4.25, <i>SD</i> = 1.10), 0–5	Moderate (<i>M</i> = 3.36, <i>SD</i> = 1.43), 0–5	Low (<i>M</i> = 0.47, <i>SD</i> = 0.52), 0–5	61.35***
Informational support: Dealing with conflicting information, (<i>M</i> , <i>SD</i>), range	High (<i>M</i> = 5.57, <i>SD</i> = 1.53), 0–7	Moderate (<i>M</i> = 3.93, <i>SD</i> = 1.60), 0–7	Low (<i>M</i> = 0.33, <i>SD</i> = 0.49), 0–7	83.32***
Emotional support: Giving and/or receiving emotional support, (<i>M</i> , <i>SD</i>), range	High (<i>M</i> = 7.37, <i>SD</i> = 1.50), 0–9	Low (<i>M</i> = 2.57, <i>SD</i> = 1.56), 0–9	Moderate (<i>M</i> = 5.60, <i>SD</i> = 1.76), 0–9	199.91***

Note. Significant difference for the one-way ANOVA was set at 5%.

* $p < .05$; ** $p < .01$; *** $p < .001$.

seeking, the clusters only significantly differed in their eHealth literacy, $F(2, 178) = 11.77$, $p < .001$. Considering the overall sample's average ($M = 1.99$, $SD = 0.43$), the overall seekers ($M = 1.98$, $SD = 0.35$) scored about average for eHealth literacy. They appeared to be slightly more eHealth literate than the occasional information seekers ($M = 1.91$, $SD = 0.38$) but less eHealth literate than the contact exchangers ($M = 2.47$, $SD = 0.75$). Post hoc analysis revealed

a significant difference between the overall seekers and contact exchangers ($p < .001$, mean diff. = 0.49) but no significant difference between the overall seekers and the occasional information seekers ($p = .524$, mean diff. = 0.07). Yet, the occasional information seekers differed significantly in their eHealth literacy from the contact exchangers ($p < .001$, mean diff. = 0.56). Comparisons between the clusters based on characteristics are presented in Table 5.

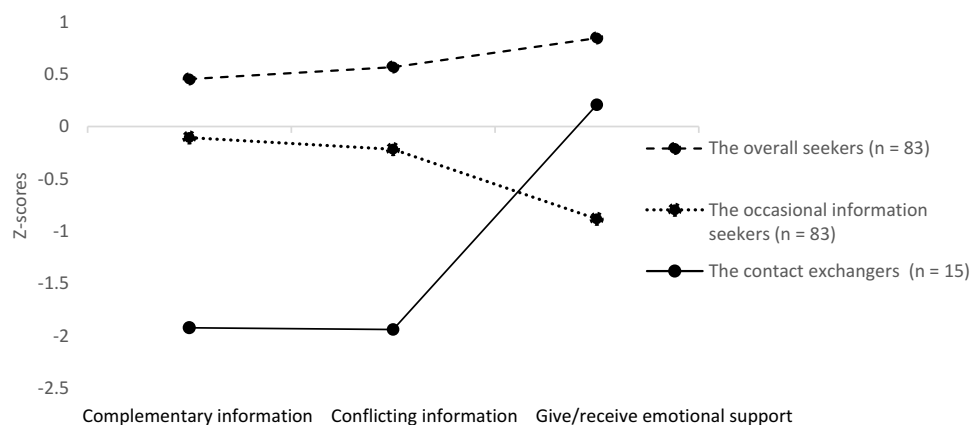


Figure 2. Hierarchical cluster analysis revealed a three-cluster solution.

Table 4. Representation of the three clusters based on the three motive categories.

Category	Motives (Would you visit Kanker.nl if you ...)	The overall seekers (n = 83), n (%)	The occasional information seekers (n = 83), n (%)	The contact exchangers (n = 15), n (%)
Informational support: Looking for complementary information	... want to better understand what the health provider has told you?	77 (92.8) ^a	68 (81.9) ^{a***}	2 (13.3) ^{b***}
	... received too little information from your health provider?	78 (94.0) ^a	71 (85.5) ^{a***}	3 (20.0) ^{b***}
	... have any questions after your conversation with your health provider?	67 (80.7) ^{a**}	47 (56.6) ^{c***}	0 (0.0) ^{b***}
	... want to reduce your uncertainties (e.g., about treatment, the future)?	71 (85.5) ^{a***}	49 (59.0) ^{c***}	1 (6.7) ^{b***}
Informational support: Dealing with conflicting information	... want to prepare for your conversation with your health provider?	60 (72.3) ^{a*}	44 (53.0) ^{c**}	1 (6.7) ^{b**}
	... have received conflicting information from different health providers?	81 (97.6) ^a	77 (92.8) ^{a***}	3 (20.0) ^{b***}
	... want to put the information that the health provider has told you into perspective?	63 (75.9) ^{a***}	40 (48.19) ^{c**}	0 (0.0) ^{b***}
	... came across conflicting information on the Internet?	71 (85.5) ^a	60 (72.3) ^{a***}	1 (6.7) ^{b***}
	... have received conflicting information from your family and/or friends?	52 (62.7) ^{a***}	23 (27.7) ^b	0 (0.0) ^{b***}
	... want to check the information from the health provider?	65 (78.3) ^{a***}	39 (47.0) ^{c**}	0 (0.0) ^{b***}
	... have received information that goes against your own opinion?	72 (86.7) ^{a**}	52 (62.7) ^{c***}	1 (6.7) ^{b***}
Emotional support: Giving and/or receiving emotional support	... want information that you did not want to discuss with your health provider during the conversation?	58 (69.9) ^{a***}	35 (42.2) ^{c*}	0 (0.0) ^{b***}
	... want to feel understood by others?	58 (69.9) ^{a***}	17 (20.5) ^{ab}	6 (40.0) ^a
	... want to have contact with fellow cancer patients?	38 (45.8) ^{a***}	80 (96.4) ^a	15 (100.0) ^{b***}
	... want information about the possibilities for contact with fellow cancer patients?	77 (92.8) ^{a***}	32 (38.6) ^{b***}	13 (86.7) ^a
	... want to share your current situation?	72 (86.7) ^{a***}	11 (13.3) ^{c***}	9 (60.0) ^{b*}
	... want emotional support?	45 (54.2) ^{a***}	6 (7.2) ^b	3 (20.0) ^{ab}
	... want to share the information you have received from your health provider with others?	61 (73.5) ^{a***}	12 (14.5) ^b	4 (26.7) ^{b***}
	... want the experiences and advice of other patients?	81 (97.6) ^{a***}	55 (66.3) ^b	12 (80.0) ^{ab}
	... want to share your experience(s) with others (e.g., about treatment, consequences for your work?)	74 (89.2) ^{a***}	20 (24.1) ^{c*}	8 (53.3) ^{b*}
	... want to participate in group conversations/group discussions?	64 (77.1) ^{a***}	22 (26.5) ^{b***}	14 (93.3) ^a

Note. Differing superscripts (a, b, c) indicate significantly different mean scores within a row; comparisons were made between clusters in order of 1 to 2, 3 to 1, and 2 to 3 and provided with level of significance in the same order * $p < .05$; ** $p < .01$; *** $p < .001$.

Discussion

In this study, we identified three online support-seeking profiles based on their motives for using the internet to seek informational and/or emotional support: the overall seekers, the occasional information seekers, and the contact exchangers. The overall seekers represented almost half of the sample and appeared to be the most motivated to use the website Kanker.nl for three main motives: looking for complementary information, dealing with conflicting information, and giving and/or receiving emotional support. The second largest group, the occasional information seekers, appeared to be almost equally moderately motivated to use the internet for seeking complementary information and dealing with conflicting information, but the least motivated to use the internet to

give and/or receive emotional support. The smallest group, the contact exchangers, noticeably differed from the others in being the least motivated to seek informational support and more motivated than the other two groups to give and/or use emotional support. These results are in line with existing research, showing that cancer patients primarily go online to seek informational support, but seek emotional support to a less extent (Maddock et al., 2011; Mattsson et al., 2017; Sanders et al., 2020; Van Eenbergen et al., 2020).

We found the three profiles not only vary in motive but also differ in their level of eHealth literacy, with the contact exchangers being more eHealth literate than the overall seekers and the occasional information seekers. This seems to contradict our expectations of patients with higher levels of eHealth

Table 5. Comparison of the three clusters based on psychological and background characteristics, and perception of health care services.

Variable	The overall seekers (<i>n</i> = 83; 45.9%)		The occasional information seekers (<i>n</i> = 83; 45.9%)		The contact exchangers (<i>n</i> = 15; 8.3%)		<i>F</i> -test (2, 178), <i>p</i> -value	Welch and Games-Howell post hoc pattern
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Cancer-related psychological distress								
Intrusive thinking	2.82	0.73	2.72	0.65	2.63	0.77	0.75, <i>p</i> = .475	ns
Cancer Worry	2.04	0.71	1.91	0.65	2.10	0.78	0.97, <i>p</i> = .381	
Intolerance for uncertainty	2.42	0.71	2.20	0.64	2.39	0.77	2.27, <i>p</i> = .107	
Coping style	4.05	1.01	4.01	1.02	3.60	1.02	1.37, <i>p</i> = .256	ns
Trust in doctors	3.85	0.83	4.13	0.70	4.00	0.92	2.67, <i>p</i> = .072	ns
Age	60.66	7.63	60.93	10.77	56.80	8.43	1.30, <i>p</i> = .276	ns
Gender, <i>n</i> (%)							1.61, <i>p</i> = .203	ns
Male	40 (48.2)		43 (51.8)		4 (26.7)			
Female	43 (51.8)		40 (48.2)		11 (73.3)			
Educational level, <i>n</i> (%)							1.19, <i>p</i> = .307	ns
Low education level	10 (12.0)		10 (12.0)		3 (20.0)			
Middle education level	36 (43.4)		22 (26.5)		3 (20.0)			
High education level	37 (44.6)		51 (61.4)		9 (60.0)			
eHealth literacy ^a	1.98	0.35	1.91	0.38	2.47	0.75	11.77, <i>p</i> < .001	1 < 3 ***; 2 < 3 ***

Note. One-way ANOVAs with Welch and Games-Howell post hoc tests for violation of the assumption of homogeneity variance. ^a = significant difference among all profiles (global level), for the one-way ANOVA, significant difference among all profiles was set at 5%.

* *p* < .05; ** *p* < .01; *** *p* < .001; ns = non-significant.

literacy being more likely to seek informational support online than less eHealth literate patients (Heiman et al., 2018). One explanation for this result can be that patients with higher eHealth literacy may be in need of more detailed medical information than provided by a general health website like Kanker.nl, and instead use other sources, such as online medical journals or databases (e.g., PubMed), to fulfill their information needs (Li et al., 2014; McMullan, 2006). The higher eHealth literate contact exchangers in our study mainly seemed to use the studied website to contact peers. This suggests that general health websites like Kanker.nl are best able to fulfill the information needs of lower eHealth literate groups. Therefore, referrals to use such general health websites might be most beneficial to them (Heiman et al., 2018). In contrast, higher eHealth literate patients might benefit more from accessible academic literature. To pinpoint which platforms or websites are particularly beneficial for patients with higher or lower eHealth literacy levels, it would be worthwhile to examine different types of patient groups visiting various platforms and websites in future studies, especially since the results and assumptions of this study are based on one specific online group of patients visiting one particular general health website.

Theoretical implications

This study contributes to a better understanding of the individual differences in patients' online support-seeking behavior. Using the UGT and stress and coping theory provided a firm theoretical basis for our profiles: The UGT proved tenable for understanding patients' motives for online support-seeking and understanding that the internet mainly serves two primary functions for patients coping with an illness such as cancer, i.e., fulfilling content and social gratifications (Rains et al., 2015; Sanders et al., 2020; Stafford et al., 2004; Van Eenbergen et al., 2018). Our results showed that in search of different gratifications some patients mainly use the internet to seek specific

content (i.e., informational support), while others use the medium to mainly seek contact with peers (i.e., emotional support). In turn, the stress and coping theory showed the importance of patients' differences in coping which led to its use as a theoretical basis for examining differences between typical patient profiles. Our findings are in line with the theoretical assumption that people actively seek to fulfill their needs through finding the proper type of support (Cutrona & Russell, 1990; Cutrona & Suhr, 1992; Cutrona, 1990), as we found patients to employ problem-focused coping through seeking informational support online and/or emotion-focused coping through seeking emotional support online. This presence of seeking informational and/or emotional support online within both the UGT and stress and coping theory suggests that the two theories complement each other and show novel insights into the continuous interaction between content and social gratifications. In other words, the two coping strategies derived from the stress and coping theory (problem-focused coping and/or emotion-focused coping) seem to lead to the need for content gratifications and/or social gratifications, resulting in seeking informational and/or emotional support online. Indeed, informational and emotional support have previously been associated with problem- and emotion-focused coping (Carver et al., 1989). As informational and emotional support-seeking are accounted for in both theories, it would be worthwhile to test in future research how the stress and coping theory and UGT can be combined into a truly integrated model for online information seeking. Based on previous research in the offline setting (i.e., patient-provider communication), suggesting that patients' need for emotional support consists of both instrumental and affective needs (Brandes et al., 2017), there seems to be no straightforward relation between problem-focused coping and content gratifications respectively emotion-focused coping and social gratifications. This indicates an interplay between these two coping strategies and the two types of gratifications (content and

social gratifications). For example, a patient may express problem-focused coping by searching for information on treatment online (e.g., to look for complementary or to deal with conflicting information), or by connecting with peers on an online forum (i.e., receive and/or give peer support). On the other hand, if a patient feels distressed, they could express emotion-focused coping by connecting with peers online to deal with their emotions, or by searching for online factual information. As such, future research needs to take into account how the stress and coping theory could be extended by integrating the UGT while also acknowledging this interplay of the different coping strategies and gratifications of the UGT.

Practical implications

Our study contributes to improving health care providers' information provision and suggests some useful directions for clinical practice. The findings can be used to create awareness among providers that there are three different types of cancer patients that differ in their motives for seeking informational and/or emotional support online. Oncology health care providers can use this knowledge to know which patients may be more in need of (online) informational and/or emotional support. Importantly, it can support them in finding the proper type of support that match patients' individual support needs. These insights are needed to tailor the referrals to further (online) sources. Therefore, we advise providers to find out what type of patient they are encountering and whether the patient prefers additional online and/or offline support. In case a patient prefers to use the internet after the consultation and receive recommendations for accurate and reliable websites, providers should determine the amount of confidence one has in their internet use and whether they have used it prior to the medical encounter (i.e., eHealth literacy). For example, they could ask patients questions regarding motives for seeking informational support and/or emotional support. In particular, questions that relate to the biggest differences across the three patient profiles in our study could be used to determine which sort of websites or online platforms are the best suited for the patient (e.g., "Would you prefer to visit the internet to check the information that is discussed during this consultation?"). In addition, similar motive-related questions could be used in cases where a patient (also) wishes to receive support offline and/or feels less confident in their use of the internet. While doing so, each of the three different patient profiles can serve as a persona to tailor the referrals to online platforms or websites that fit the patient's individual needs (Vosbergen et al., 2015). A persona in this case is essentially an explicit description of a particular patient that represents one of the subgroups of patients that seek support online (Haas & Kunz, 2009). For instance, our results could inform providers whether a patient would prefer recommendations for a more general health website, such as Kanker.nl, would prefer support finding (and interpreting) more detailed information, as found in medical journals, or, for "contact exchangers" they might recommend

an online support group. This way, providers will act as moderators by guiding patients' internet use (de Frutos et al., 2020). This is important because more and more patients appear to request online recommendations from providers (de Frutos et al., 2020; Katz et al., 2014; Maddock et al., 2011).

The awareness of different patient profiles can help providers to tailor recommendations not only to accurate and reliable websites or platforms, such as Kanker.nl, but also which type of offline sources of support (e.g., patient organization, nurse practitioner, psychologist, social worker) that fit patients' individual needs would benefit the patient. For example, when providers encounter a patient who could be an "overall seeker" they could refer to a nurse practitioner for more informational support and to a psychologist or patient organization for emotional support from peers. Finally, our results may also be useful for web designers and patient organizations in developing informational and emotional support options for patients with cancer. This means that they should take different patient profiles (i.e., personas) and different levels of eHealth literacy into account when creating layout, content, and materials (Vervloet et al., 2019). Consequently, future research on interventions should investigate whether the three patient profiles provide sufficient foundation for supporting health care providers in tailoring recommendations to further (online) sources. Additionally, future studies should examine if the patient profiles can serve as personas for patient organizations and web designers to develop informational support for patients with cancer.

Limitations and future directions

This study has some limitations. To which profile a patient has been assigned in our cluster analysis may have been determined by how the participants interpreted the motives as well as by our categorization of the motives. As previous research showed an interplay between cancer patients' need for informational support and need for emotional support, implying that some emotional support motives (emotion-focused coping) may be interpreted as informational support motives (problem-focused coping), and vice versa (Brandes et al., 2017), participants' individual characteristics and their personal situation may have affected their interpretation of the motives. Future research could investigate this interplay by, for instance, combining quantitative methods with more in-depth qualitative methods examining which specific online content cancer patients end up searching, depending on their needs and motives for seeking informational and/or emotional support online.

Whether other factors distinguish the profiles besides the motives and eHealth literacy is yet still unknown, as our results only showed validation for this characteristic. There may be several reasons for this. First, our sample consisted of patients already active online which may have given a biased view of patients' motives to seek informational and/or emotional support online since actively participating in an online community (i.e., online panel) requires certain skills in itself (Van Eenbergen et al., 2022). We recommend future research to examine which other relevant factors may relate to the motives for seeking informational and/or emotional support online. For example, theories and theoretical models such as social determination

theory (SDT), Longo's expanded model of health information-seeking behaviors, and Johnson's comprehensive model of information seeking may provide additional insights into possible factors that might distinguish the different profiles (Lalazaryan & Zare-Farashbandi, 2014; Lee & Lin, 2020; Wang et al., 2020). According to SDT, someone's level of autonomy, relatedness and competence are important drivers for the development of motivation. Additionally, Longo's and Johnson's model may provide other personal characteristics that might be better suited to examine the differences between clusters, for example, culture, attitudes, cognitive abilities, salience, and beliefs (Lambert & Loissele, 2007; Longo et al., 2010). Other research also suggests personality traits (e.g., neuroticism, agreeableness, openness to experience, conscientiousness, and/or extraversion) as influential factors (Al-Samarraie et al., 2017; Li et al., 2014; Shun et al., 2014). Second, needs and motives may be considered as distinct variables, such that needs generate the tendency to go online (i.e., initial stimuli) and that motives are the actual reasons for patients' continued internet use (Yli-uotila et al., 2013). This may imply that differences between the clusters are better explained by needs than by patients' individual characteristics. Third, our sample (the online panel from Kanker.nl) may have been homogenous in nature and too small which might have influenced the results regarding the individual characteristics. Van Eenbergen et al. (2022), for instance, have shown that there are differences in internet use between a population-based sample and an online cancer community (e.g., an online panel), meaning that the latter might not be representative of the group of cancer survivors in general. Moreover, studies have shown that patients with higher educational attainment are more likely to search online (Cotten & Gupta, 2004; De Looper et al., 2021; Van de Poll-Franse & Van Eenbergen, 2008). Our sample mainly consisted of patients with mid to high levels of education which might be the reason why we found no difference between the profiles in terms of educational level. In addition, traditional notions of statistical power of the sample size seem to apply only partially to cluster analysis, indicating that a greater sample does not necessarily improve the results (Dalmaijer et al., 2021). Recent research that uses cluster analysis has proven its usefulness and appropriateness, some including small samples as well (e.g., Bol et al., 2020; Gültzow et al., 2020; Smit et al., 2010, 2018). Fourth, there may have been a recall bias at the time of completing the survey because patients' time since diagnosis varied from two months to more than five years after diagnosis. Emotions, such as anxiety, and with that the need for information and/or emotional support change over time, indicating that the timing of the survey might have mattered (Matsuyama et al., 2013; Mattsson et al., 2017). Therefore, we encourage future studies to examine patients' motives for going online real-life, i.e., simultaneously with the actual online seeking behavior than retrospectively. Finally, since this study focused on including several user-oriented motives that originated from the need for problem-focused coping and content gratifications, and the need for emotion-focused coping and social gratification, we suggest future studies to also include motives, such as using the internet for its anonymous character, from a media-oriented perspective based on the UGT expectation that patients also use the internet because of process gratifications (Stafford et al., 2004).

Conclusion

Using the UGT and stress and coping theory in this study resulted in theoretically-founded profiles of cancer patients in terms of their motives to seek informational and/or emotional support online. This study is the first to explore individual differences across groups of cancer patients that seek support online. Health care providers should be aware that cancer patients not only vary in their motives for seeking informational and/or emotional support but that patients also differ in their level of eHealth literacy. The three patient profiles (the overall seeker, the occasional information seekers, and the contact exchangers) found could serve as a description of a particular patient representative (i.e., persona) for providers, web designers, and patient organizations to tailor to individual patients. Furthermore, based on the results of this study we suggest future research to investigate extending the stress and coping theory by acknowledging the interplay of different coping strategies and different gratifications. Many studies have examined health-related (online) support-seeking behavior, using similar and different theories and/or models concentrating on a few factors which complicates a comprehensive understanding of the behavior. Therefore, the need for future research to develop theories and/or models capable of addressing their extension and integration continues to grow.

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Data availability statement

The data underlying this article will be shared upon reasonable request to the corresponding author.

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