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Perceived emotional and informational support for cancer: Patients' perspectives on interpersonal versus media sources

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Abstract: This study examined cancer patients' ($N = 355$, 65.4% female, $M_{age} = 54.35$, $SD_{age} = 11.25$) perceived emotional and informational support from a variety of interpersonal and media sources. We recruited patients from cancer patient association websites and online cancer forums and asked them to report to what extent they received support from interpersonal and media sources. Patients rated professional sources (e. g., oncologists) and personal sources (e. g., family) as nearly equal sources of emotional support; however, professional sources were rated as significantly greater sources of informational support. Although family and oncologists were the most mentioned interpersonal sources of support, they were also the most mentioned disappointing sources. Of the media sources, online interaction sources (e. g., online support groups) were rated as nearly equivalent sources of emotional support as interpersonal sources. That patients perceived emotional support, not only informational support, from various media sources is promising since interpersonal sources can be disappointing to some patients.

Keywords: cancer, social support, interpersonal communication, digital health, online support groups, mediated communication

1 Introduction

Cancer is a leading cause of morbidity and mortality worldwide (World Health Organization, 2021). People with cancer often seek information related to their illness, possible treatments, and disease management (Finney Rutten et al., 2016); however, those needs are often unmet (Finney Rutten, Arora, Bakos, Aziz,

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and Rowland, 2005). Additionally, individuals with cancer may be confronted with psychosocial challenges, such as feelings of vulnerability, loss of control, and uncertainty about the future (Pickles, Ruether, Weir, Carlson, and Jakulj, 2007). These feelings may cause negative health outcomes, such as distress, which interferes with adaptation to illness (Carlson, Waller, Groff, Giese-Davis, and Bultz, 2011). One way that people with cancer cope with psychosocial stressors and unmet information needs is through social support (Arora, Finney Rutten, Gustafson, Moser, and Hawkins, 2007; Tunin, Uziely, and Woloski-Wruble, 2010).

Social support is a broad construct that refers to what individuals say and do to support one another (Goldsmith, 2004). Many types of social support have been described, such as emotional, informational, instrumental, esteem, and network support (Cohen, Underwood, and Gottlieb, 2000). However, across interpersonal and computer-mediated contexts, emotional support (e. g., caring, empathy) and informational support (e. g., advice) are among the most commonly reported types of support provided or received by people with serious illnesses like cancer (Arora et al., 2007; Rains, Peterson, and Wright, 2015; Van Eenbergen, Van de Poll-Franse, Krahmer, Verberne, and Mols, 2018).

However, perceived emotional support and informational support vary according to the particular interpersonal source. For example, several studies have found that health care providers are considered the primary source of informational support (Arora et al., 2007; Finney Rutten et al., 2005; Finney Rutten et al., 2016; Tunin et al., 2010). Yet, family, especially partners, tend to be considered the primary source of emotional support (Arora et al., 2007; Yoo et al., 2014). In computer-mediated contexts, online support groups are often perceived as sources of both emotional and informational support among people with cancer (Rising, Bol, Burke-Garcia, Rains, and Wright, 2017; Van Eenbergen et al., 2018).

Because social support has been conceptualized as a phenomenon that occurs between people (e. g., Albrecht and Goldsmith, 2003), the possibility that people feel emotionally or informationally supported by media that do not necessarily involve a person-person interaction has been largely overlooked. Yet, the current media environment demands reconsideration of the way support is perceived by people and conceptualized by scholars, as online content can elicit affective responses and perceptions of social support (see Cho et al., 2018; Oh, Ozkaya, and LaRose, 2014). Although media sources with a variety of features have been acknowledged as vital resources for cancer patients (Eysenbach, 2003; Yli-Uotila, Rantanen, and Suominen, 2014), there is a gap in the literature with respect to patients' perceptions of these diverse sources as emotional and informational support providers.

Therefore, the conceptual definition of perceived social support in this study is perceived emotional and informational support from both interpersonal

and media sources. We define sources as the support providers, such as family, friends, and health care providers for interpersonal sources, and websites, online support groups, and informational handouts for media sources. Using this conceptual framework, we aim to advance our understanding of perceived emotional and informational support across a variety of interpersonal and media sources. With our study, we aim to extend existing knowledge of social support by nuancing the specific sources of support cancer patients identify, both in terms of interpersonal and media sources. This may lend important insights into how to better meet social support needs of cancer survivors. What is learned by comparing perceived emotional and informational support from different sources may also provide direction for future interventions focused on meeting these needs and expectations and, ultimately, help reduce risk for negative psychosocial sequelae.

Interpersonal sources of social support

Interpersonal sources of social support during cancer survivorship include family, friends, acquaintances, and health care providers, such as oncologists, general practitioners, and nurses. Cumulative evidence shows that family is especially looked to for caring, empathizing, reassuring, and comforting (Arora et al., 2007; Tunin et al., 2010). These signs of emotional support have the potential to strengthen interpersonal relationships and provide meaning to the cancer experience (Fisher, 2010; Thornton and Perez, 2006). Research has also shown that health care providers have a role as providers of emotional support, however, their provision of informational support tends to be reported more frequently (Arora et al., 2007; Finney Rutten et al., 2016).

In the current literature it is problematic that the exact family bond in which social support is enacted is often not clarified in studies; yet there might be vast differences in how support is given or perceived, whether it is from a partner or other family members (Fisher, 2010). Similarly, some studies have measured perceived social support from health care providers without distinguishing the specific provider (Arora et al., 2007), while others have not included health care providers in their measurement of interpersonal sources (Han et al., 2005). Similar to measurement issues related to personal sources of social support (i. e., family, partner, friends), conclusions that can be drawn about perceived social support from professional sources is limited when the specific provider (e. g., oncologist, nurse, general practitioner) is not clarified or included. For these reasons, further research is needed to examine perceived social support from a range of interpersonal sources where such distinctions are made. Therefore, the following research questions are posed:

- RQ1a: To what extent do cancer patients perceive emotional support across a variety of interpersonal sources?
- RQ1b: To what extent do cancer patients perceive informational support across a variety of interpersonal sources?
- RQ1c: Are there differences between perceived emotional and informational support across interpersonal sources?

Although social support literature acknowledges that emotional and informational support are perceived in varying degrees from different sources, perceived quality of social support is not consistently measured across studies. Interactions that constitute poor quality (i. e., negative or disappointing support) include, but are not limited to, discouraging the expression of feelings, making critical remarks, failing to provide promised help, and being unable to reciprocate help (Lincoln, 2000; Wright and Miller, 2010). Some studies have highlighted that these disappointing interactions occur within the context of family (Fisher, 2010), friendships (Høybye, Johansen, and Tjørnhøj-Thomsen, 2005), and within patient-provider interactions (Chapple, Ziebland, and McPherson, 2004). Disappointment with social support in the context of cancer warrants attention since it might contribute to poor psychosocial outcomes, limiting the ability to adapt to illness (Lincoln, 2000). Other researchers have acknowledged that negative support is a variable worthy of analysis (Lincoln, 2000; Yli-Uotila et al., 2014). However, because the specific disappointing interpersonal source is not always clearly differentiated across studies, the following question is posed:

- RQ2: What interpersonal sources do patients perceive as disappointing sources of social support in the context of their cancer?

Media sources of social support

A prominent media source of social support for people with cancer is online support groups (Buis and Whitten, 2011; Van Eenbergen et al., 2018; Yoo et al., 2014). Online support groups (also called online support communities) range from those found on non-profit or for-profit organization websites (e. g., kanker.nl, patientslikeme.com) to member-only networks of cancer survivors on commercial platforms, such as Facebook (Kashian and Jacobson, 2018). Although – due to the private nature of some groups – it is challenging to calculate population-level estimates of cancer survivors' use of online support groups/communities, a large clinic-based survey found that about 12% of respondents report participat-

ing in a dedicated online support group for cancer survivors (An, Wallner, and Kirch, 2016). Support from weak ties, such as online support group/community members, may be preferred over strong ties, such as family members, because knowledge and concerns can be shared with similar others (Høybye et al., 2005; Wright and Miller, 2010). Because social support is typically conceptualized as an interpersonal transaction, it makes sense that the interactions between and among online support group/community members have been examined by social support researchers.

Whether other media sources that do not involve interpersonal interaction are perceived as sources of social support by people with cancer is unclear based on extant research. Online sources outside of support groups/communities include educational websites and mobile applications, for example, while offline media sources include books, magazines, and educational pamphlets. Although some studies have begun to examine media sources, especially internet sources, more broadly to be inclusive of perceived social support (e. g., Cho et al., 2018; Yli-Uotila et al., 2014), perceptions across media source types have not been evaluated. A more complete understanding of the function of media sources is essential since social support from interpersonal sources has been shown to wane along the continuum of survivorship (Arora et al., 2007). Thus, the following research questions are posed:

- RQ3a: To what extent do cancer patients perceive emotional support across a variety of media sources?
- RQ3b: To what extent do cancer patients perceive informational support across a variety of media sources?
- RQ3c: Are there differences between perceived emotional and informational support across media sources?

Also important to our understanding of a social support function of different media sources is how perceived social support (i. e., emotional, informational) compares to perceived social support from traditional interpersonal sources such as partners, family, friends, and health care providers. Others have compared family sources to online support group/community sources in the context of breast cancer (Yoo et al., 2014), but, to our knowledge, comparative analyses of perceived emotional and informational support from a variety of interpersonal sources and media sources have not been made. Along with determining the extent to which social support is perceived, comparative analyses may illuminate the value of including and distinguishing particular sources of social support in this as well as future research. Findings from comparison across source types may also highlight where communication interventions are most needed (e. g.,

helping family members communicate support, designing media that convey support). Therefore, the following research questions are posed:

RQ4a: How does perceived emotional support from media sources compare to perceived emotional support from interpersonal sources?

RQ4b: How does perceived informational support from media sources compare to perceived informational support from interpersonal sources?

2 Method

Sampling strategy and procedure

Survey respondents were recruited from several cancer patient association websites (subdivisions of the Dutch Federation of Cancer patient organizations) and online cancer forums, such as “De Amazones” and “Borstkankerforum”, using voluntary sampling. After obtaining permission from each administrator, a brief description of the study, invitation to participate, and a link to the online questionnaire were posted to the participating online cancer communities or shared via e-mail. To be included in the study, respondents must have been diagnosed with cancer, aged 18 years old or older, and fluent in Dutch (reading and writing). All respondents provided informed consent via the online questionnaire before the survey started.

Measures

Perceived social support. Perceived social support was measured with an adapted version of the Medical Outcomes Study (MOS) Social Support Scale. This scale has twelve items, eight of which measure emotional and informational support needs (Sherbourne and Stewart, 1991). These eight relevant items were adapted to measure interpersonal sources and media sources of social support (see items 1–8 in Appendix A). Four additional items (see items 9–12 in Appendix A) were added to be inclusive of suggestions, advice, and factual input that constitute informational support for cancer (Chang, 2009). Sample items representing the two domains of the adapted scale include: “This person/source helped me deal with private worries and fears” (emotional support) and “This person/source gave me information about where to find important information about cancer” (informational support). Ratings were made on a five-point scale

with the anchors *totally disagree* (1) and *totally agree* (5). The two adapted scale dimensions, emotional support (7 items: $M = 3.68$, $SD = 0.70$, $range = 1-5$, $\alpha = .93$) and informational support (5 items: $M = 3.19$, $SD = 0.81$, $range = 1-5$, $\alpha = .91$), had good reliability.

Sources of social support. Both interpersonal sources of support and media sources of support were assessed. Interpersonal sources were measured by asking respondents to name a maximum of ten people who provided support or information during the cancer trajectory. Respondents were prompted to think about personal relationships, such as a partner, family, friends, or acquaintances, as well as professional relationships, such as oncologists, nurses, or general practitioners (GPs). Respondents were then asked to categorize these relations into personal (i. e., “partner”, “family”, “friends”, and “acquaintances”) and professional (i. e., “oncologist”, “nurse”, and “general practitioner”) sources of support. This categorization resulted from a pre-test ($N = 8$). After naming a maximum of ten people, the top three people mentioned were automatically displayed on the next page where respondents were asked to assess the amount of social support received by these sources via the adapted MOS Social Support Scale. A question about disappointing sources followed their assessment; respondents were asked to name a maximum of ten interpersonal sources that provided disappointing social support during illness, and to indicate their relationship with these sources.

Media sources were measured by asking the respondents to name a maximum of ten media sources which provided support or information during the cancer trajectory. Respondents were prompted to think about offline sources, such as books and magazines, as well as online sources, such as online support groups and educative websites. Again, respondents were asked to categorize those sources into offline sources (i. e., “books/magazines”, and “educational pamphlets”), online textual information (i. e., “educative websites”), or online interaction (i. e., “online support groups” and “online health professionals/medical experts”). Online interaction was categorized as a media source rather than an interpersonal source because most patients described their online contacts as media sources during the pilot test. Additionally, the category “educational pamphlets” resulted from the pilot test as offline source category, which was initially not part of the list of media sources. For the top two mentioned media sources, the amount of social support was assessed using the adapted MOS Social Support Scale. We chose to only present three interpersonal and two media sources of support to decrease the burden of filling out the questionnaire as much as we could. We based our decision for three versus two sources on a pre-test ($N = 8$), where we found that patients mentioned on average eight interpersonal support sources ($M = 8.25$, $SD = 1.91$), whereas these same patients only mentioned on average three media support sources ($M = 3.13$, $SD = 1.96$).

Medico-demographics. Medico-demographic items included age, gender, time since cancer diagnosis, type of cancer, types of cancer treatment, stage of cancer, and the primary goal of cancer treatment, either curative or palliative.

Statistical analyses

Analyses were performed using SPSS (SPSS, Inc., Chicago, IL), and results were considered significant at a p -value of $< .05$. Descriptive statistics were performed to characterize the medico-demographics of the sample as well as the frequency with which respondents reported different types of social support (i. e., emotional, informational) from different sources (i. e., interpersonal, media). To address RQ1a/b, RQ3a/b, and RQ4a/b, three multivariate analyses of variance (MANOVAs) were executed to determine the differences in perceived emotional and informational support from interpersonal sources and media sources. The MANOVA for RQ1a/b included emotional and informational support as dependent variables and type of interpersonal source (i. e., partner, family, friends, acquaintances, oncologist, nurse, and GP) as independent variable. For RQ3a/b, the MANOVA included emotional and informational support as dependent variables and type of media source (i. e., books, educational pamphlets, educative websites, online support groups, and online health professionals/medical experts) as independent variable. The third MANOVA for RQ4a/b included emotional and informational support as dependent variables and type of interpersonal (i. e., personal and professional) and media (i. e., offline sources, online textual information, and online interaction) sources as a combined independent variable. For RQ1c and RQ3c, two mixed ANOVA were conducted to evaluate differences between emotional and informational support from interpersonal versus media sources. For RQ1c, the mixed ANOVA included type of social support (i. e., emotional and informational support) as within-subjects factor and type of interpersonal source (i. e., partner, family, friends, acquaintances, oncologist, nurse, and GP) as between-subjects factor. For RQ3c, the mixed ANOVA included type of social support (i. e., emotional and informational support) as within-subjects factor and type of media source (i. e., books, educational pamphlets, educative websites, online support groups, and online health professionals/medical experts) as between-subjects factor. Bonferroni corrections were used for subsequent post-hoc analyses. To correct for medico-demographics (i. e., age, gender, time since diagnoses, stage of cancer), we additionally performed three MANCOVAs and two Mixed ANCOVAs. As we did not have specific hypotheses or RQs pertaining the theoretical contribution of these medico-demographics, we present the results in Appendix B (see Table B2). Controlling for medico-demographics

only slightly changed the results. Significant changes are reported in the results section below. Frequencies were used to analyze disappointing interpersonal sources (RQ2).

3 Results

Medico-demographics

A total of 355 respondents completed the online survey. The sample of cancer patients were on average 54.31 years old ($SD = 11.24$, $range = 22-80$), and approximately 65% ($n = 232$) of respondents were female. Nearly half of respondents had been diagnosed with cancer more than four years prior to the study (47.9%, $n = 170$) and were in the follow-up phase of treatment (47.0%, $n = 167$). Most respondents had been diagnosed with hematological cancer (48.2%, $n = 171$) or breast cancer (28.5%, $n = 101$). The most common types of treatment in this sample were chemotherapy (67.0%, $n = 238$), surgery (53.8%, $n = 191$), and radiotherapy (43.1%, $n = 153$). In 49.9% ($n = 177$) of the cases, the treatment goal was curative, and in 41.4% ($n = 147$) of the cases, it was palliative. The treatment goal was not yet planned in 8.5% ($n = 30$) of the cases. Medico-demographic results are shown in Table 1.

Interpersonal and media sources of social support

On average, respondents mentioned eight interpersonal sources of support ($M = 8.03$, $SD = 2.52$, $range = 1-10$, $n = 355$). Perceived emotional and informational support from personal sources was reported more frequently than that from professional sources (approximately 75% versus 25%, respectively). Among the personal sources, the most frequently reported source was family (36.1%), followed by partner (25.3%), friends (10.5%), and acquaintances (1.1%). For professional sources, oncologists were mentioned most often (17.4%), followed by nurses (3.6%), and general practitioners (2.9%). With regard to media sources, respondents mentioned on average four media sources of support ($M = 4.32$, $SD = 2.41$, $range = 0-10$, $n = 284$). Offline sources were mentioned the most (39.6%), followed by online textual information (33.6%) and online interaction (26.8%).

Perceived emotional and informational support from different sources

Interpersonal sources of support. Our first research questions focused on the extent to which a variety of interpersonal sources provide perceived emotional support (RQ1a) and informational support (RQ1b), respectively. We also questioned whether there would be differences in perceived emotional support versus perceived informational support within each interpersonal source category (RQ1c).

With respect to RQ1a, a MANOVA showed significant variance in perceived emotional support among the different interpersonal sources of support, $F(8, 1025) = 6.71$, $p < .001$, $\eta_p^2 = .05$. The general practitioner was rated highest for emotional support ($M = 4.28$, $SD = 0.62$), followed by friends ($M = 3.95$, $SD = 0.81$), nurse ($M = 3.93$, $SD = 0.81$), and partner ($M = 3.90$, $SD = 0.84$). Family was found to be the second lowest source of emotional support ($M = 3.59$, $SD = 0.89$), and acquaintances rated lowest ($M = 3.22$, $SD = 1.16$). Post-hoc comparisons showed that family was rated significantly lower for emotional support when compared to partner ($p < .001$), friends ($p = .002$), and the GP ($p = .001$). Acquaintances were also rated significantly lower for perceived emotional support than the GP ($p = .010$) (see Table 2).

Regarding RQ1b, we found significant variance in perceived informational support among interpersonal sources of support, $F(8, 1025) = 48.65$, $p < .001$, $\eta_p^2 = .28$. Professional sources were rated significantly higher than personal sources ($M = 3.85$, $SD = 1.06$; $M = 2.23$, $SD = 1.18$), $t(1002) = 19.29$, $p < .001$. Oncologist was rated highest for informational support ($M = 3.91$, $SD = 1.01$), followed by nurse ($M = 3.76$, $SD = 1.09$), and general practitioner ($M = 3.58$, $SD = 1.28$). Family ($M = 2.15$, $SD = 1.17$) and acquaintances ($M = 2.13$, $SD = 1.04$) were rated nearly equally low. The partner ($M = 2.32$, $SD = 1.19$) and friends ($M = 2.28$, $SD = 1.18$) were also rated relatively low for informational support. Post-hoc comparisons showed that compared to oncologist, family ($p < .001$), partner ($p < .001$), friends ($p < .001$), and acquaintances ($p < .001$) were rated significantly lower for informational support. Similarly, compared to the nurse and GP, family ($p < .001$), partner ($p < .001$), friends ($p < .001$), and acquaintances (resp. $p = .001$ and $p = .010$) were rated significantly lower for informational support.

Finally, with regard to RQ1c, a mixed ANOVA showed a difference between perceived emotional and informational support across different interpersonal source categories, $F(1, 1025) = 203.66$, $p < .001$, $\eta_p^2 = .17$. On average, interpersonal sources of support provided more emotional support ($M = 3.77$, $SE = 0.05$) than informational support ($M = 2.86$, $SE = 0.07$). These differences in emotional and informational support were specifically found for the partner ($M_{emotional} = 3.91$,

$SE = 0.05$, 95 % CI [3.80, 4.01]; $M_{\text{informational}} = 2.32$, $SE = .07$, 95 % CI [2.19, 2.46]), family ($M_{\text{emotional}} = 3.59$, $SE = 0.04$, 95 % CI [3.50, 3.67]; $M_{\text{informational}} = 2.15$, $SE = .06$, 95 % CI [2.03, 2.26]), and friends ($M_{\text{emotional}} = 3.96$, $SE = 0.08$, 95 % CI [3.80, 4.11]; $M_{\text{informational}} = 2.28$, $SE = .11$, 95 % CI [2.07, 2.50]). The oncologist ($M_{\text{emotional}} = 3.82$, $SE = 0.06$, 95 % CI [3.70, 3.94]; $M_{\text{informational}} = 3.91$, $SE = .09$, 95 % CI [3.74, 4.08]) and nurse ($M_{\text{emotional}} = 3.93$, $SE = 0.14$, 95 % CI [3.66, 4.20]; $M_{\text{informational}} = 3.76$, $SE = .19$, 95 % CI [3.39, 4.12]) provided nearly equal and relatively high levels of both emotional and informational support. These differences are reported in Table 2.

Disappointing interpersonal sources. We posed a research question (RQ2) about which interpersonal sources cancer patients perceive as disappointing sources of social support in the context of their cancer. On average, respondents reported two disappointing interpersonal sources ($M = 1.78$, $SD = 2.36$, $range = 0-10$, $n = 355$); 47.0 % reported no disappointing sources. Personal sources (77.5 %) were reported more often than professional sources (22.5 %). Family (34.1 %) was the most frequently reported disappointing personal source, followed by friends (26.2 %), acquaintances (14.4 %), and partners (2.9 %). For professional sources, oncologists (14.8 %) were reported most often as a disappointing source, followed by general practitioners (4.7 %), and nurses (3.0 %). These results are displayed in Table 3.

Media sources of support. Our third research question focused on the extent to which different media sources provide perceived emotional support (RQ3a) and informational support (RQ3b). We also questioned whether there would be differences in perceived emotional support versus perceived informational support within each media source category (RQ3c).

With respect to RQ3a, respondents perceived relatively high levels of emotional support from all media sources (all media sources scored above the midpoint, 3.00). Although differences were small, a MANOVA revealed significant variance in perceived emotional support among the different media sources, $F(5, 539) = 9.27$, $p < .001$, $\eta_p^2 = .08$. Online support groups were rated the highest for emotional support ($M = 3.85$, $SD = 0.75$), followed by online health professionals/medical experts ($M = 3.65$, $SD = 0.74$) and books/magazines ($M = 3.57$, $SD = 0.80$). Educational pamphlets were found to be the second lowest source of emotional support ($M = 3.30$, $SD = 0.79$), and educative websites were rated lowest ($M = 3.29$, $SD = 0.83$). Post-hoc comparisons showed that online support groups had significantly higher ratings for emotional support when compared to educational pamphlets ($p < .001$) and to educative websites ($p < .001$).

Differences by media source for perceived informational support (RQ3b) were nonsignificant, $F(5, 539) = 2.02$, $p = .074$, $\eta_p^2 = .02$. Nevertheless, online health professionals/medical experts were rated the highest ($M = 4.22$, $SD = 0.72$), followed by online support groups ($M = 4.16$, $SD = 0.85$). Books/magazines were

rated lowest for informational support ($M = 3.79$, $SD = 1.00$). When controlling for medico-demographics, differences by media source for perceived informational support were significant, $F(5, 446) = 2.41$, $p = .036$, $\eta_p^2 = .03$. However, pairwise comparisons did not reveal significant differences between the various media sources.

Finally, regarding RQ3c, a mixed ANOVA showed overall significant differences between emotional and informational support across media sources, $F(1, 539) = 87.27$, $p < .001$, $\eta_p^2 = .14$. On average, respondents perceived more informational support ($M = 4.01$, $SE = 0.04$) than emotional support ($M = 3.58$, $SE = 0.04$) from media sources. More specifically, educational pamphlets ($M_{emotional} = 3.30$, $SE = 0.09$, 95 % CI [3.13, 3.48]; $M_{informational} = 3.96$, $SE = .10$, 95 % CI [3.76, 4.16]), educational websites ($M_{emotional} = 3.29$, $SE = 0.07$, 95 % CI [3.16, 3.42]; $M_{informational} = 3.98$, $SE = .08$, 95 % CI [3.83, 4.13]), and online health professionals/medical experts ($M_{emotional} = 3.65$, $SE = 0.12$, 95 % CI [3.41, 3.89]; $M_{informational} = 4.22$, $SE = .14$, 95 % CI [3.95, 4.50]) were rated significantly higher on informational support than emotional support. When controlling for medico-demographics, significant differences in emotional and informational support for online health professionals/medical experts disappeared ($M_{emotional} = 3.94$, $SE = 0.20$, 95 % CI [3.56, 4.33]; $M_{informational} = 4.21$, $SE = .22$, 95 % CI [3.78, 4.64]).

Interpersonal and media sources by type of social support

Perceived emotional support. The first part of our fourth research question (RQ4a) focused on how perceived emotional support from media sources compares to perceived emotional support from interpersonal sources. Comparison of interpersonal and media sources by perceived emotional support showed that there were significant differences, $F(4, 1443) = 17.04$, $p < .001$, $\eta_p^2 = .05$. Professional sources were rated the highest for emotional support ($M = 3.89$, $SD = 0.79$) and online textual information the lowest ($M = 3.29$, $SD = 0.83$). Online textual information was rated significantly lower on emotional support than personal sources ($p < .001$), professional sources ($p < .001$), and online interaction ($p < .001$). Offline media sources were also rated significantly lower on emotional support than personal sources ($p < .001$), professional sources ($p < .001$), and online interaction ($p = .008$). Online interaction sources were rated almost equally as high as the interpersonal sources of support ($M_{online\ interaction} = 3.78$, $SD = 0.75$; $M_{personal\ sources} = 3.75$, $SD = 0.88$; $M_{professional\ sources} = 3.89$, $SD = 0.79$, respectively). These results are represented in Figure 1.

Perceived informational support. The second part of our fourth research question (RQ4b) focused on how perceived informational support from media

sources compares to perceived informational support from interpersonal sources. Comparison of interpersonal and media sources by perceived informational support using a MANOVA also showed that there were significant differences, $F(4, 1443) = 232.84, p < .001, \eta_p^2 = .39$. Online interaction sources were rated the highest for informational support ($M = 4.18, SD = 0.81$) and personal sources the lowest ($M = 2.23, SD = 1.18$). Personal sources were rated significantly lower on informational support than professional sources ($p < .001$), offline sources ($p < .001$), online textual information ($p < .001$), and online interaction sources ($p < .001$). These results are depicted in Figure 2.

4 Discussion

The aim of this study was to examine cancer patients' perceived emotional and informational support from a variety of interpersonal and media sources. Our analyses included an evaluation of the type of perceived social support within each source category, sources of disappointing support, comparison of the type of perceived social support across source categories, and a comparison of sources by type of perceived social support. With respect to interpersonal sources, we found that personal sources, such as partner, family, and friends, were perceived as comparatively greater sources of emotional support, while professional sources, such as oncologists, nurses, and general practitioners, were perceived as comparatively greater sources of informational support. Although this finding is consistent with previous studies (Arora et al., 2007; Finney Rutten et al., 2005; Finney Rutten et al., 2016; Tunin et al., 2010), we extend the current understanding of perceived emotional and informational support from interpersonal sources through some unique findings.

For example, partners, friends, and general practitioners were perceived as significantly greater sources of emotional support than family. Other studies have collapsed personal relations or different health care providers into one category (Arora et al., 2007; Han et al., 2005); we were able to detect important differences in perceived social support by making clear source distinctions. One limitation, however, is that all family members except for partners were included in the 'family' category, therefore we were unable to determine potentially meaningful differences in perceived social support by family member position or role (e.g., mother, father, sibling, cousin). We recommend delineation of non-partner family members in future studies.

We also found that personal and professional sources were considered nearly equal providers of emotional support. This is unlike past findings that have high-

lighted health care providers' more essential role as informational supports (Arora et al., 2007; Chan, Molassiotis, Yam, Chan, and Lam, 2001; Finney Rutten et al., 2016). Though respondents in this study may have perceived emotional support from health care providers in beneficial ways, our findings also show disappointing support from these sources. Among professional sources, oncologists were the most frequently named source of disappointing support, and the number of mentions for perceived emotional support and disappointing support from general practitioners was matched. Other researchers have also found that long-term survivors of breast cancer have unmet emotional support needs from oncology teams (Vivar and McQueen, 2005). An important direction for future research is to explore why interpersonal sources of support were disappointing. Understanding why these sources are disappointing might help health care providers better address the social support needs of cancer patients and mitigate the potential negative psychosocial health outcomes of feeling disappointed with sources of support.

With regard to media sources, a key aim of this study was to open conceptualization of perceived social support to media sources with a diversity of features, not all of which involve interpersonal interaction. We found that cancer patients perceived social support from all types of media source categories. As might be anticipated based on earlier studies (Eysenbach, 2003; Yli-Uotila et al., 2014), media sources were significantly greater sources of informational support over emotional support. Nevertheless, all media sources were reported as important sources of emotional support, with online interaction sources rated the highest. With regard to online interaction sources, our findings are consistent with existing research (Buis and Whitten, 2011; Yoo et al., 2014). That perceived emotional support from offline sources and online textual information were also rated above the midpoint is a finding that needs further exploration. Although such media sources are not inherently social, the content could have been perceived as emotionally supportive or as fulfilling emotional support needs (Bol et al., 2013; Bol et al., 2014; King, 2015). For example, previous research has shown that, in addition to text, certain content elements such as illustrations (Bol et al., 2014) and videos (Bol et al., 2013) could result in perceiving emotional support from websites that do not enable person-to-person interactions.

Moreover, although social media use was not specifically analyzed in our study, social media research is also calling our attention to new ways of thinking about the way emotions and perceived emotional support are elicited through features of social media that are not necessarily person-to-person transactions, such as comments, likes, and images (Cho et al., 2018). A limitation of our findings is that we cannot explain how the specific content of the support provided may have contributed to perceived emotional and informational support from the

sources. In other words, we cannot conclude whether certain media sources contained specific content that was particularly perceived as supportive to cancer patients, which could be the focus of future research. Nonetheless, our findings support and extend theoretical notions of the affective responses and perceptions of social support which various media types can elicit. Whereas most findings relate to supporting such claims for media types that provide online interaction, we provide first evidence that we should not limit these affective expectations to interaction media sources only.

Compared to all other interpersonal and media sources, online interaction source received the highest overall scores for perceived emotional and informational support. This underscores the importance of continuing to study the role of online interaction sources, such as online support groups/communities, as a means of coping (see Wright, 2016 for a review). A limitation of these findings, however, is that most respondents were recruited from online cancer-related websites and groups/communities. Therefore, they may have overrepresented the perceived supportiveness of online information and interaction, as they potentially use such information because of the social support they expect from those websites. Future studies should recruit respondents from offline sites, such as outpatient oncology clinics, to confirm our findings.

A second potential limitation is that respondents may have interpreted our assessment of sources of support differently. For example, patients were first asked to name a number of people and then to categorize these people into predetermined categories of interpersonal (i. e., partner, family, friends, acquaintances, oncologist, nurse, and general practitioner) sources. Consequently, respondents might have named interpersonal sources under media sources and vice versa, which would affect subsequent responses on the survey. Furthermore, to minimize the questionnaire burden, we only asked patients to complete the social support scale for the first three interpersonal and first two media sources mentioned. Therefore, patients might have missed an opportunity to rate social support from other sources meaningful to them. Alternatively, they might have rated sources less meaningful to them simply because they were among the first three interpersonal sources or first two media sources that came to mind. These limitations should be considered when interpreting results.

Several findings from this study can be used to direct future research and communication interventions. We found that cancer patients find many interpersonal sources of support disappointing, particularly from family and oncologists. Therefore, communication interventions in oncology settings should include opportunities for all family members to develop an understanding of how to communicate emotional support to their loved one with cancer. Such interventions may benefit patients and their family members more if they are tailored to the

needs of the family member without cancer (e. g., caregiving partners) in addition to the needs of the partner with cancer (Kleine, Hallensleben, Mehnert, Honig, and Ernst, 2019).

To further improve our understanding of how people perceive support from a variety of sources and to develop communication interventions accordingly, future research could also focus on disappointing media sources. Exploring adolescent and young adult cancer patients' perceptions of disappointing (as well as satisfying) media sources may help advance science in this area as they are predominantly digital natives (Viola, Panigrahi, and Devine, 2020). Such research could provide insights into how to improve media sources in their attempt to provide adequate support and information to patients during the cancer trajectory but could also provide insight into *when* which type of source and content is desired by patients to cope with their illness. A study focusing on, among other things, instrumental and emotional social support found that patients preferred different modes of delivery of support depending on the topic they would want to discuss (Linn, Van der Goot, Brandes, Van Weert, and Smit, 2019). For example, patients indicated they preferred discussing psychosocial and practical topics with their doctor in an interpersonal way, whereas more sensitive topics such as fear of dying were rather discussed with peers in mediated settings, such as on online platforms. Exploring such venues could provide relevant practical insights for communication interventions that focus on how emotional and informational support can be best delivered to patients.

The fact that health care providers are considered a source of emotional support in addition to being a source of informational support suggests that development and refinement of professional training in patient-provider communication should continue. Furthermore, as cancer patients perceive emotional and informational support from a variety of media sources, developers of mediated interventions should focus on enhancing immediacy. According to Kreps (2014), "immediacy is a powerful communication process that humanizes and intensifies interaction by promoting physical and emotional closeness, interpersonal comfort, engagement and caring, personal involvement, enthusiasm, authenticity, and enjoyment". The immediacy of online media, in particular, might be enhanced by considering personalization, interactivity, engagement, and approachability (Alpert, 2015).

In conclusion, the results of this study provide new insights into how cancer patients perceive social support across diverse interpersonal and media sources. Although many media sources do not involve interpersonal interaction, they may nevertheless provide a sense of caring or concern as perceived by individuals (Cho et al., 2018). We have shown that there is value in measuring perceived social support from diverse media sources, however, this needs further investigation in

a larger, nationally representative sample. As digital health continues to expand, we need to better understand under which circumstances which interpersonal and media sources contribute to emotional and informational support for which patients to optimize the way in which social support can be delivered across the cancer-care continuum.

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Table 1: Medico-demographic characteristics ($N = 355$).

<i>Variable</i>	<i>n</i>	<i>%</i>
Gender		
Female	232	65.4
Male	123	34.6
Age		
Mean (SD)	54.31	11.24
Range	22 – 80	
Diagnosis		
< 1 yr. ago	41	11.5
1–4 yrs. ago	144	40.6
> 4 yrs. ago	170	47.9
Stage of cancer ¹		
Diagnosis	15	4.2
Treatment	76	21.4
Post-treatment	67	18.9
Follow-up	167	47.0
Type of cancer		
Hematological cancer	171	48.2
Breast cancer	101	28.5
Gynecological cancer	40	11.3
Gastroenterological cancer	37	10.4
Esophagus cancer	16	4.5
Urological cancer	9	2.5
Skin cancer	4	1.1
Lung cancer	2	0.6
Other	4	1.1
Type of treatment		
Chemotherapy	238	67.0
Surgery	191	53.8
Radiotherapy	153	43.1
Stem cell transplantation	60	16.9
Hormone therapy	57	16.1
Immunotherapy	30	8.5
Antibody therapy	7	2.0
None	20	5.6
Other	14	3.9
Goal of treatment ²		
Curative	177	49.9
Palliative	147	41.4
Other	30	8.5

Note. ¹ Percentages do not add up to 100 % due to unknown data by respondents ($n = 325$).

Note. ² Percentages do not add up to 100 % due to unknown data by respondents ($n = 354$).

Table 2: Interpersonal and media sources of support and corresponding perceived emotional and informational social support.

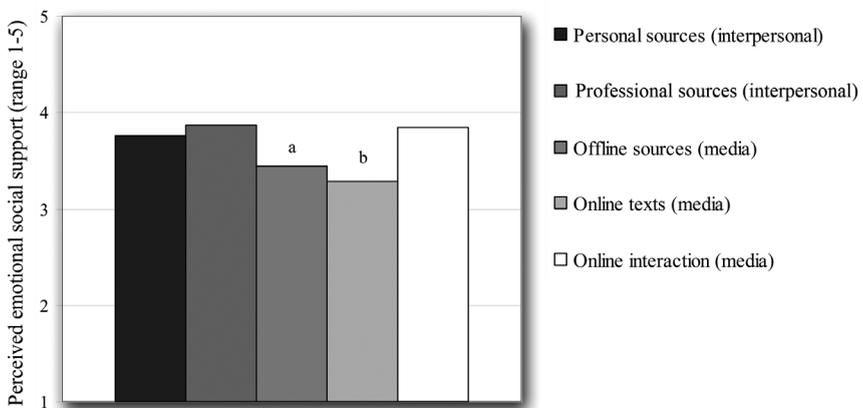
	<i>n</i>	<i>%</i>	Emotional social support		Informational social support	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Interpersonal sources of support						
<i>Personal sources</i>	755	75.2	3.74	0.88	2.23*	1.18
Family	369	36.8	3.59	0.89	2.15*	1.17
Partner	264	26.3	3.90	0.84	2.32*	1.19
Friends	110	11.0	3.95	0.81	2.28*	1.18
Acquaintances	12	1.2	3.22	1.16	2.13	1.04
<i>Professional sources</i>	249	24.8	3.89	0.79	3.85	1.06
Oncologist	183	18.2	3.82	0.79	3.91	1.01
Nurse	38	3.8	3.93	0.81	3.76	1.09
GP	28	2.8	4.28	0.62	3.58	1.28
Media sources of support						
<i>Offline sources</i>	176	39.6	3.44	0.80	3.87*	0.92
Books/magazines	93	20.9	3.57	0.80	3.79	1.00
Educational pamphlets	83	18.7	3.30	0.79	3.96*	0.81
<i>Online textual information</i>	149	33.6	3.29	0.83	3.98*	0.85
Educative websites	149	33.6	3.29	0.83	3.98*	0.85
<i>Online interaction</i>	119	26.8	3.78	0.75	4.18	0.81
Online support groups	77	17.3	3.85	0.75	4.16	0.85
Online health professionals/medical experts	42	9.5	3.65	0.74	4.22*	0.72

Notes. Sample sizes, percentages, means, and *SDs* in this table are based on MANOVAs, resulting in a difference of $n = 19$ for interpersonal sources of support (due to missing data on informational social support scale). Consequently, percentages mentioned in the text differ slightly from percentages reported in this table. Sample sizes are based on the top 3 interpersonal sources and top 2 media sources mentioned. These sample sizes were representative of the full sample, with an overrepresentation of the partner in the top 3 interpersonal sources (top 3 = 26.3%; full sample = 11.2%) and an underrepresentation of friends (top 3 = 11.0%; full sample = 22.0%). Significant differences for interpersonal and media sources between emotional and informational social support are indicated with an asterisk and are based on non-overlapping 95% confidence intervals. GP = General Practitioner.

Table 3: Interpersonal sources that provided disappointing social support.

	<i>n</i>	%
Interpersonal sources		
<i>Personal sources</i>	462	77.5
Family	203	34.1
Friends	156	26.2
Acquaintance	86	14.4
Partner	17	2.9
<i>Professional sources</i>	134	22.5
Oncologist	88	14.8
GP	28	4.7
Nurse	18	3.0

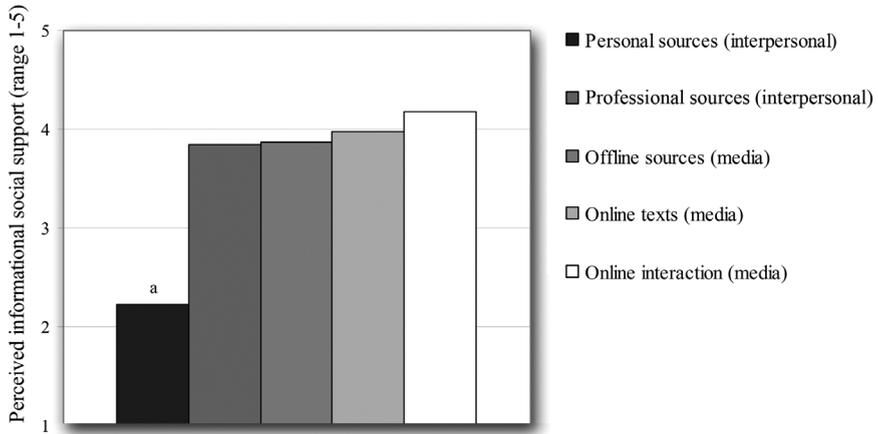
Note. GP = General Practitioner.



^a Offline sources scored significantly lower than personal sources ($p < .001$), professional sources ($p < .001$) and online interaction ($p = .008$)

^b Online textual information scored significantly lower than personal sources ($p < .001$), professional sources ($p < .001$) and online interaction ($p < .001$)

Figure 1: Perceived emotional support from interpersonal and media sources.



^a Personal sources scored significantly lower than professional sources ($p < .001$), offline sources ($p < .001$), online textual information ($p < .001$) and online interaction ($p < .001$)

Figure 2: Perceived informational support from interpersonal and media sources.

Appendix A: Adapted MOS Social Support Scale

1. This person/source gave me confidence and hope.
2. This person/source gave me confidence to talk about myself and my problems.
3. This person/source helped me deal with private worries and fears.
4. This person/source helped me understand my problems.
5. This person/source gave me advice about how to deal with a certain stressful moment (e. g., the diagnosis).
6. This person/source gave me suggestions on how to deal with private problems.
7. I really wanted to receive advice from this person/source.
8. This person/source gave me information to help me understand a situation better.
9. This person/source gave me information about the diagnosis of cancer.
10. This person/source gave me information about the treatment options for cancer.
11. This person/source gave me information about the surgery options for cancer.
12. This person/source gave me information about where to find important information about cancer.

Appendix B: Analyses controlled for medico-demographics

Table B2: Interpersonal and media sources of support and corresponding perceived emotional and informational social support controlled for age, gender, time since diagnosis, and stage of cancer.

	<i>n</i>	<i>%</i>	Emotional social support		Informational social support		
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Interpersonal sources of support							
<i>Personal sources</i>	699	75.8	3.74	0.93	2.21*	1.17	
Family	343	37.2	3.61	0.87	2.14*	1.17	
Partner	245	26.6	3.92	0.82	2.32*	1.17	
Friends	100	10.8	3.93	0.82	2.20*	1.17	
Acquaintances	11	1.2	3.07	1.10	2.05	1.05	
<i>Professional sources</i>	223	24.2	3.86	0.79	3.84	1.03	
Oncologist	166	18.0	3.79	0.80	3.90	0.99	
Nurse	35	3.8	3.90	0.82	3.78	1.08	
GP	22	2.4	4.27	0.59	3.44	1.25	
Media sources of support							
<i>Offline sources</i>	160	38.4	3.43	0.81	3.87	0.94	
Books/magazines	87	20.9	3.55	0.80	3.78	1.01	
Educational pamphlets	73	17.5	3.29	0.81	3.96*	0.85	
<i>Online textual information</i>	142	34.1	3.27	0.83	4.00*	0.84	
Educative websites	142	34.1	3.27	0.83	4.00*	0.84	
<i>Online interaction</i>	115	27.6	3.79	0.76	4.18	0.81	
Online support groups	74	17.7	3.86	0.76	4.16	0.86	
Online health professionals/medical experts	41	9.8	3.64	0.75	4.21	0.73	

Notes. Sample sizes, percentages, means and *SDs* in this table are based on MANCOVAs, resulting in differing samples sizes than those reported in Table 1 (due to missing data on age [$n = 1$] and stage of cancer [$n = 60$]). Significant differences for interpersonal and media sources between emotional and informational social support are indicated with an asterisk and are based on non-overlapping 95 % confidence intervals. GP = General Practitioner.