Effectiveness, acceptance and satisfaction of guided chat groups in psychosocial aftercare for outpatients with prostate cancer after prostatectomy

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ABSTRACT

Background: Physical and psychological symptoms associated with prostate cancer and its treatment can cause patients to feel distressed. Furthermore, patients still experience a range of unmet support needs. Online interventions have the potential to fill a gap in cancer care by augmenting the limited available mental health services.

Objective: The main goal of the study was to evaluate the effectiveness of guided chat groups in psychosocial aftercare for outpatients with prostate cancer. Additionally, the participants' satisfaction with and acceptance of the intervention was measured and evaluated.

Methods: A quasi-experimental design was used to analyze the research questions. 18 prostate cancer patients followed five web-based chat-group sessions. 26 patients received treatment as usual. The guided chat group enabled patients to exchange concerns, problems and support with fellow patients. The intervention group and control patients had to fill in self-reported questionnaires before the intervention and at a follow-up. Outcome measures include distress, anxiety, depression, anger, need for help, quality of life (QoL), fear of progression (FoP) and coping with cancer. To analyze the effectiveness of the chat groups, an analysis of covariance was conducted.

Results: The analysis of covariance revealed one significant difference between the two groups for the outcome anger. The difference had a large effect size ($\eta^2 = 0.160$) with higher scores for the intervention group. Further differences with a medium effect size were found for coping with cancer, the physical component of quality of life and depression. The intervention group scored higher on all three outcomes.

Additionally, participants reported that the atmosphere in the chat sessions was confidential and believed that the chat program worked as a bridge between inpatient treatment and daily life.

Conclusions: Intervention participants reported poorer results for the primary and secondary outcomes in comparison to the control group patients at follow up, which indicates that web based chat groups may not be an effective way to decrease prostate cancer perceived distress even if the intervention participants seem to accept the intervention.

1. Introduction

Carcinoma of the prostate is the most prevalent cancer diagnosis among men in Germany (Kaatsch et al., 2012). Localized prostate cancer is highly treatable which keeps the mortality rate at a low level. The five year relative survival rate, in Germany, was 93% in the year 2012 (Kaatsch et al., 2012). Despite the high survival rate, all treatment options may result in decreased health related quality of life, including symptoms as erectile dysfunction, urinary incontinence, and dysfunction of the bowel (Attard et al., 2016; Resnick et al., 2013). These symptoms may influence prostate cancer patients' mental health (Bokhour et al., 2001; Roth et al., 2008). The four week prevalence for any mental disorder in prostate cancer patients is about 21% (Mehnert et al., 2014), 10% of prostate cancer patients report an increased level of psychological distress (Chambers et al., 2014) and a previous study using the Memorial Anxiety Scale for Prostate Cancer (MAX-PC)

observed an increased level of anxiety in 10% of prostate cancer patients (Roth et al., 2006).

Psychosocial interventions are used by health care professionals trying to reduce the amount of distress that prostate cancer patients experience. A systematic review (Parahoo et al., 2015), including 19 psychosocial intervention studies showed that psychosocial interventions had small short-term effects, but failed to show statistically significant long-term effects (Parahoo et al., 2015). Despite the available psychosocial support prostate cancer patients still experience a range of unmet support needs with the most frequently reported being needs related to intimacy, health system/informational, physical and psychological needs (Paterson et al., 2015). Internet interventions have the potential to fill an important gap in quality cancer care by augmenting limited available mental health services (Leykin et al., 2012).

Internet based intervention programs may have certain characteristics that can be advantageous in comparison to standard intervention programs: using the internet keeps the costs low, holds appeal for many in accessing information and support anonymously, supports patients in rural areas and could bridge gaps in the provision of care (Andersson and Cuijpers, 2008; Cuijpers et al., 2008; Moessner and Bauer, 2017; Zepf et al., 2003). Internet based support programs seem to work effectively in numerous studies, improving psychosocial and physical symptoms in cancer patients with variant cancer diagnosis (Bouma et al., 2015).

However, only four studies (Osei et al., 2013; Schover et al., 2012; Wootten et al., 2015; Yanez et al., 2015) were found that concentrate on the group of prostate cancer patients, who tend to have positive attitude towards eHealth (Jansen et al., 2015). The treatment offered in these four interventions, the target groups as well as the results of these four interventions differed greatly. The treatments offered were: one self-guided cognitive behavioral group therapy (Wootten et al., 2015), a virtual group therapy (Yanez et al., 2015), a mail based couple therapy (Schover et al., 2012) and an educational support network (Osei et al., 2013). Two interventions targeted patients with localized prostate cancer patients (Schover et al., 2012; Wootten et al., 2015), while one addressed patients in an advanced stage (Yanez et al., 2015) and one study did not specify the patients' disease or treatment stage (Osei et al., 2013). Osei et al. (2013) did not find any significant improvements in patients' quality of life, while Wootten et al. (2015) observed a significant improvement in psychological distress within the intervention group from pre to post intervention. Yanez et al. (2013) could only report trends for improvement in distress and functional well-being in comparison with those in the control group and Schover et al. (2012) found improved scores of the International Index of Erectile Functioning (IIEF) within the groups who received the group therapy online or via face to face. One common limitation was the dropout or recruitment rate. Two studies had major problems with the recruitment of patients (Osei et al., 2013; Yanez et al., 2015), while one suffered from high dropout (Schover et al., 2012) and one had a dropout that was higher than expected (Wootten et al., 2015).

The online chat program used in this study has been tested in an unpublished pilot study. It was offered to breast and prostate cancer patients after inpatient rehabilitation. Significant improvements in general as cancer specific quality of life could be found for the intervention group ($n = 79$) in comparison to the control group ($n = 880$) at follow up (after completing the intervention). The recruitment of participants has been a major problem of the pilot study.

The main goal of this study was to evaluate the effectiveness of a web based chat group on the mental health of prostate cancer patients. We hypothesized that intervention participants will show greater improvements compared to the control group participants in the primary outcome, distress, from baseline to follow-up. Furthermore, we hypothesized that intervention participants will show greater improvements compared to control group participants in the secondary outcomes anxiety, depression, anger, need for help, FoP, health related quality of life (HRQoL) and coping with cancer from baseline to follow-up. Additionally, the participants' satisfaction with and acceptance of the intervention was measured and evaluated.

2. Method

2.1. Study design

The hypotheses were analyzed in a quasi-experimental design, with an internet chat program as the intervention condition and treatment as usual as the control condition. The patients were administered a series of self-report questionnaires in order to measure the effectiveness of and satisfaction with the intervention in comparison to the control group. Intervention and control participants had to complete the self-reported questionnaires at two measurement points. The baseline measurement was before starting the intervention. The second measurement point was after finishing the intervention.

A prior power analyses recommended including a sample of approximately 170 patients who would have been assigned to the intervention or control group. 60 patients per group would have been sufficient for the analyses of covariance to find a primary intervention effect with medium effect size (eta-squared = 0.058), using a level of significance of $\alpha = 0.05$ and a statistical power $(1 - \beta)$ of $P = 0.80$. The expected dropout rate at follow up was 30% which would increase the number of patients per group by another 25 individuals.

Due to low participation rates, we could not follow our planned study protocol and had to omit randomization. Patients got the possibility to choose if they wanted to participate in the intervention group, control group or reject participation. Informed consent was obtained from all patients who wanted to participate in the study.

The study was approved by the ethics committee of the Medical Chamber Hamburg. Written informed consent was obtained from the participants prior to enrollment.

2.2. Participants

Participants were recruited from July 2012 to January 2014 (17 month). They were approached while staying in the Martini-Klinik for their prostatectomy. The Martini-Klinik in Hamburg performs about 2200 prostate operations per year. The inclusion criteria for participation were: being 18 years or older, a medical diagnosis of prostate cancer, internet access at home and sufficient oral and written proficiency of the German language. Patients with severe emotional crisis were excluded and referred to a specialist.

Prostate cancer patients were informed about the novel aftercare program at the beginning of their hospital stay. Patients who decided to participate had to wait until further prostate cancer patients were recruited in order to form an intervention group. The average time between the date of the prostatectomy and the date of the intervention start was 5.3 months. The baseline questionnaires were mailed to intervention and control group participants' home address before the start of the first online group session. Follow up questionnaires were mailed to the participants after completion of the fifth chat session. A reminder letter was sent out to non-respondents with the same content, two weeks after the first letter.

2.3. Intervention

In the context of this intervention study, prostate cancer patients had the opportunity to exchange concerns, problems and support with fellow patients in online chat programs, which were guided by certified psychological psychotherapists who were experienced in the field of psycho-oncology and who were informed about the ongoing inpatient treatment by the clinic staff. In preparation for the chat groups, the patients participating in the program were handed over a user manual introduction for the chat program before leaving the hospital. The psychotherapists knew all group members in person, as they had a

preliminary talk with the participants during inpatient treatment. Additionally, each group member was called before the beginning of the online intervention by phone. The personal contact between psychotherapist and intervention participants should build mutual trust in order to create a productive atmosphere in the chat sessions. During the time of the intervention a contact person from the department of Medical Psychology was reachable by phone to assist with technical issues and problems.

Intervention participants followed 5 group sessions in three different chat groups containing nine, six and three participants. The five sessions of the three groups took place from November 2013 to January 2014 for group one, and from January 2014 to February 2014 for groups two and three. The chats were held on a weekly basis, and each session lasted about 60–90 min depending on the patients' input. The group members met in virtual rooms that they could access via https://www.chatgruppe.de/martini/website/home.php. Within the virtual chat room participants communicated through written messages that were always addressed towards all participants. The chatroom was secured by a self-determined password and username, which also protected the patients' identity from the other participants. A quick help menu on the website answered common questions (e.g.: How to login?). The structural framework used in the chat groups was the 'behavior-therapy-oriented group approach without defined goals' (Fiedler, 2001). The topic of each particular session was specified at the beginning of the group conversation by the group members and the psychologist. Topics of conversation that were proposed by the therapist were incontinence, FoP, partnership and sexuality after prostatectomy, doctor-patient communication, occupational reintegration, resource-orientation and coping. Furthermore, open interaction between patients was encouraged by the psychotherapists, to offer emotional relief and enhance group cohesion.

Patients in the control group were treated on the basis of the German S3 guideline for prostate cancer patients. Each prostate cancer patient had the opportunity to get additional professional psychological, social and spiritual support during in and outpatient treatment.

2.4. Measures

2.4.1. Demographic and medical information

Demographic data such as age, education, professional situation and family status and basic medical data such as comorbidity or mode of surgery were collected from the patients at follow-up. Additionally, patients reported whether they used psychosocial support outside the clinic in the last months.

2.4.2. Outcome evaluation

The Emotion Thermometers (ET-5) were used in order to measure the primary outcome patients' perceived distress and the secondary outcomes anxiety, depression, anger and need for help (Mitchell et al., 2010). ET-5 includes five scales: 1) the Distress Thermometer (DT) 2) the Anxiety Thermometer (AnxT) 3) the Depression Thermometer (DepT) 4) the Anger Thermometer (AngT) 5) the Need for Help Thermometer. Each of the five domains is rated on an 11-point $(0-10)$ Likert scale in a visual thermometer format (Mitchell et al., 2010).

To measure the patients' HRQoL, patients had to fill in the German version of the SF-8 (Beierlein et al., 2012; Roth et al., 2006), containing the Physical Component Summary (PCS) and Mental Component Summary (MCS) at both measurement points.

The German version of the MAX-PC is an 18 item scale which measures three kinds of prostate-related anxieties: general anxiety related to prostate cancer and treatment, anxiety specifically related to PSA testing, and fear of disease recurrence or disease progression (Lehmann et al., 2006; Roth et al., 2006). The total score can range from 0 to 54, with 54 indicating the maximum prostate cancer specific anxiety. In the German validation of the MAX-PC, the scale demonstrated a high internal consistency ($\alpha = 0.85$) and a good construct

validity (Lehmann et al., 2006).

The Cancer Coping Questionnaire (CCQ) is a 21 item, self-rating scale designed to measure coping skills of cancer patients. The questionnaire has a good internal consistency ($\alpha = 0.87$) and test-retest reliability ($r = 0.90$) (Moorey et al., 2003).

2.4.3. Satisfaction and acceptance measures

To measure the satisfaction with- and acceptance of the online intervention, several self-developed sets of items were used. The first set of items tries to identify why control group patients did not want to participate in the intervention. Patients could choose between seven different response options. It was possible to give more than one answer. The second set of items measured why participants decided to participate in the chat program. Participants had five different response options or could write down their own motive for participating. To evaluate the chat sessions, participants had to fill in a 25 item list. After completing the item list, participants still had the possibility to comment on their evaluation. The items were scored on a 5 point Likert scale (1: "I strongly agree" to 5: "I strongly disagree"). One open ended question gave the participants the opportunity to suggest how to improve the intervention. Another two items asked patients if they would recommend the chat program to other prostate cancer patients and if they would participate for a second time. Both items were scored on a 5 point Likert scale. The last item asked participants if they would or would not pay for the chat group.

2.5. Statistical analysis

All of the statistical procedures were performed with SPSS version 22.0 (SPSS Inc., Chicago, IL, USA). Data records that had > 30% missing values per variable or case in the primary and secondary outcome parameters were excluded. The remaining missing values were imputed with the Expectation-Maximization-Algorithm.

Comparisons of the intervention- and control group, concerning the socio-demographic variables, were conducted by means of t-tests for independent groups and chi-squared tests. To analyze the effectiveness of the chat groups, analyses of covariance were conducted. Primary and secondary outcomes were compared at follow up, with their baseline values as covariates. To control for potential sociodemographic confounding variables, we included sociodemographic variables which significantly differed between the two groups at baseline as an additional covariate. Furthermore, a t-test for independent groups examined, if there were differences in the primary or secondary outcome between the intervention group and control group at baseline. Descriptive statistics values (means, SD) were used and interpreted to evaluate the patient satisfaction with and acceptance of the intervention.

For additional interpretation of all inferential statistical analyses, effect sizes were calculated: partial eta-squared for analysis of covariance and Cohen's d for t-tests. The values of Cohen's d or eta-squared for a small, medium and large effect are 0.2, 0.4. and 0.8 or 0.009, 0.058 and 0.137, respectively (Cohen, 1988). The alpha level of significance was set at $\alpha = 0.05$ for all tests.

3. Results

3.1. Patient flow

In sum, 384 prostate cancer patients were approached during their inpatient treatment (Fig. 1). 241 patients decided not to participate in the study. 151 of the 241 patients answered the question why they refused to participate in the study. Reasons for non-participation were: not being interested in the study ($n = 50$) and not being able to use a computer ($n = 31$) or the internet ($n = 37$); feeling that the mental burden ($n = 14$) or the physical burden ($n = 6$) of the intervention is too severe; and 13 patients reported various reasons for not
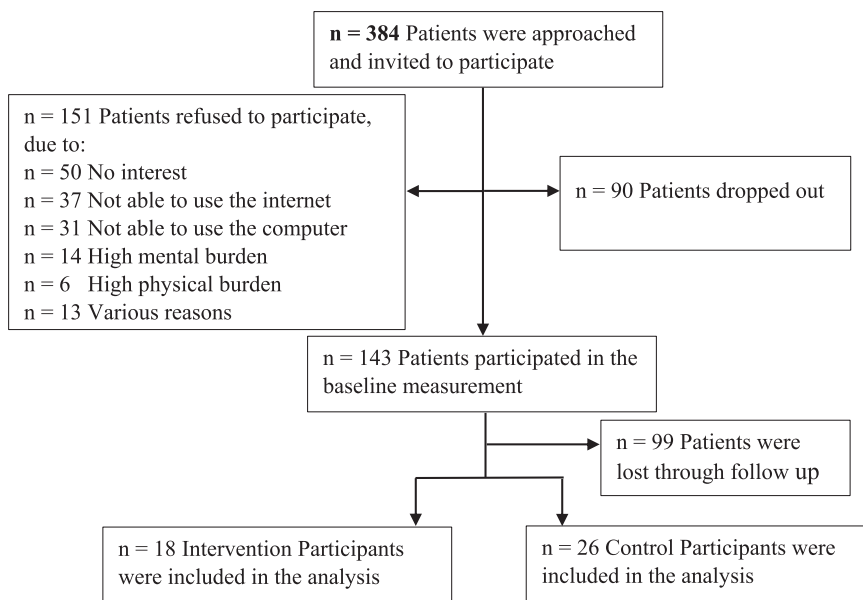
Fig. 1. Flow diagram of study participants from first approach to follow up measurement.

participating in the study (e.g. have to move, want to reduce the time spent online, my attitude towards the disease will not help other patients). 143 patients decided to participate in the study and filled in the questionnaires at baseline, as part of the intervention group or control group. 99 patients were lost between baseline and follow-up measurement. This reduces the sample size that can be analyzed at both measurement points to $n = 18$ for the intervention group and $n = 26$ for the control group. Post hoc power analyses reveals, that with the given sample size the power to detect a medium effect size of eta-squared is 53% and that with an acceptable power of 80% we are able to detect only large effect sizes (eta-squared ≥ 0.15).

3.2. Demographic and medical information at follow up

Table 1 illustrates the demographic characteristics of the sample. The mean age of participants was 60.5 years in the intervention and 62.8 years in the control group. The vast majority of the participants were married or had partners (intervention: 83%, 15/18; control: 88%, 23/26). About half of the participants were working full time (intervention: 44%, 8/18; control: 46%, 12/26). In the intervention group the largest proportion of participants lived in a village (28%, 5/18) or a city (28%, 5/18), while in the control group the largest share of patients (42%, 11/26) lived in a city.

A statistical comparison between the intervention group and control group at follow-up revealed one significant difference: intervention participants were significantly more likely to make use of any psychosocial support outside the clinic from their cancer diagnosis until the follow up measurement (78%, 14/18) than patients in the control group (35%, 9/26). Additionally, differences with small effect sizes can be found: intervention participants were younger, lived less often in a city, were less often in a relationship and had a higher attitude towards psychotherapeutic support.

3.3. Comparison of baseline scores

Table 2 provides an overview of the comparison of the intervention and control group baseline scores for primary and secondary outcomes. No significant difference of the baseline scores can be found. However, there were differences in scores with small to medium effect size. Intervention and control groups differ on the MAX-PC and the PCS with a medium effect size, on the Need for Help Thermometer, the AnxT and the AngT with a close to medium effect size and on the DepT, DT, MCS, CCQ-Total with a small effect size. Intervention participants scored

higher on every scale except for the PCS and MCS, where a higher score indicates a higher HRQoL.

3.4. Effectiveness of the intervention

Examination of the effectiveness of the chat group intervention was based on the analyses of covariance (Table 3). Comparison of the intervention and control groups revealed one significant difference for one secondary outcome, the AngT. The difference had a large effect size with higher scores in the intervention group. Other differences, with a medium effect size were found for CCQ-Interaction, PCS and DepT. The intervention group scores higher on the three scales. The difference found for the primary outcome DT had a small effect size with higher scores for the intervention group.

3.5. Satisfaction with and acceptance of the intervention

For an overview on the descriptive statistics of the patient satisfaction with and acceptance of the intervention program see Tables 4 and 5. 'Lack of interest' (31%, 8/26) and 'doubting that the intervention could help me' (31%, 8/26) were the most frequent reasons for control group patients not to participate in the intervention. The most common motives for participating in the intervention were 'staying in contact with other patients' (67%, 12/18) and 'hoping to get new information about prostate cancer' (61%, 11/18). After following five group sessions, 17% of the participants reported to have 'achieved their goals' (16% (3/26)). 11% (2/11) of the participants stated that 'the group sessions were not helpful'. The most frequent suggestions for improving the chat program were to 'reduce the amount of patients per chat group' (17%, 3/18) and to 'include a doctor in the chat conversation' (17%, 3/18). The majority of intervention participants would recommend the intervention to other prostate cancer patients (78%, 14/18) and participate for a second time (65%, 11/18). About one fourth (22%, 4/18) of the participants would have paid for the chat program.

The Appendix Table A shows the intervention group's evaluation of the chat sessions. Participants reported to be content with the amount of chat sessions per week ('one session per week was sufficient') and said that 60 min per chat session was adequate. Furthermore, participants reported that the atmosphere in the chat sessions was confidential and thought that the chat program worked as a bridge between in-patient treatment and daily life. The occurrence of computer issues, access problems to the chat group and the feeling of being unable to type fast enough were not seen as a problem by most of the participants.

Table 1

Sociodemographic characteristics of the intervention group and control group patients at follow up.

	Intervention (n = 18)	Control (n = 26)	t-Test/χ²
Age in years: mean (SD)	60.53 (6.70)	62.77 (6.10)	$t = -1.091$ $p = 0.28$, $d = 0.349$
Marital status (%)			
In a relationship	83	88	$\chi^2 (n = 44)$ $= 0.238$
Single (divorced/other)	17	12	$p = 0.63$, $\Phi = 0.037$
Education (%)			
Secondary general school	17	19	$\chi^2 (n = 43)$
Intermediate secondary school	22	15	$= 1.047$ $p = 0.79$,
Grammar school/specialized grammar school	56	62	$\Phi = 0.156$
Other	0	3.8	
Missing	6	0	
Professional situation (%)			
Employed (full time/part time)	56	58	$\chi^2 (n = 43)$ $= 0.020$
Not employed (retirement/other)	39	42	$p = 0.88$, $\Phi = 0.021$
Missing	6	0	
Residence (%)			
Village	28	23	$\chi^2 (n = 44)$
Small town (< 25,000 inhabitants)	22	19	$= 1.032$ $p = 0.79$,
Medium town (25,000–100,000 inhabitants)	22	15	$\Phi = 0.153$
City (> 100,000 inhabitants)	28	42	
Usage of psychosocial support outside the clinic (%)			$\chi^2 (n = 44)$ $= 7.943$
Made use of psychosocial help	78	35	$p = 0.01$, $\Phi = 0.425$
Attitude towards psychotherapeutic support: mean (SD)	5.89 (2.67)	5.20 (3.07)	$t = 0.789$, $p = 0.43$ $d = 0.239$
Comorbidity (%)			
Heart diseases	0	11	
Cardiovascular diseases	33	39	
Respiratory diseases	11	11	
Liver diseases	11	4	
Gastrointestinal disease	11	4	
Metabolic diseases	17	27	
Diseases of the eyes	6	4	
Neurological diseases	11	0	
Musculoskeletal disorders	11	28	
Hematologic diseases	6	0	
Other diseases	11	23	

4. Discussion

The present study pursued the goal of evaluating the effectiveness of an online chat program for prostate cancer patients after prostatectomy. Due to the small amount of participants in the intervention group and control group, the study design did not have acceptable power to test the null hypothesis. Nevertheless, the results indicated that both hypotheses that were formulated prior to the implementation of the study should be rejected. Intervention participants seemed to report poorer results for the primary and secondary outcomes in comparison to the control group patients at follow up. All differences with at least a medium effect size favored the control group. The one significant difference in outcome could be found for the AngT and also favored the control group. This result was not expected. Neither is anger a feeling that is mentioned as an unmet care need of prostate cancer patients (Paterson et al., 2015), nor are there publications that report anger issues of prostate cancer patients. Furthermore, the intervention failed to replicate positive effects on variations of HRQoL (disease specific and general HRQoL), which were found in the unpublished pilot study. Comparison with the results of different online interventions does not suit the heterogeneity of this field (Moessner and Bauer, 2017).

Possible reasons for not finding the expected outcomes may be the low baseline scores of the intervention participants, the baseline scores and sociodemographic differences between the groups. The baseline scores of the intervention group were low, indicating only minor distress of the patients and making it difficult to further decrease their perceived distress. An explanation for the low baseline scores may be that the used instruments were not able to capture the real burden of prostate cancer patients, like interpersonal/intimacy needs and cancer specific information needs which are the most reported unmet care need of cancer patients (Paterson et al., 2015) or that the perceived need for psychosocial support is lower than for other cancer entities (Faller et al., 2016). The high need for cancer specific information may be supported by the fact that the participants' most reported suggestion for improvement was the "inclusion of a physician" to answer cancer specific questions. For future intervention studies it might be beneficial to use instruments which cover the constructs of the unmet needs and to preselect patients according to increased distress levels, as these studies displayed larger effects and interventions would reach the patients who really need them (Faller et al., 2013; Giesler et al., 2005; Love et al., 2008). The different baseline scores and sociodemographic differences between the groups may be explained by the fact that patients were able to choose, if they wanted to participate in the intervention or control group. On average younger patients with a higher attitude towards psychotherapeutic support, a higher need for help, who were more likely to make use of psychosocial support outside the clinic and had higher scores at baseline were more likely to choose the intervention group. The differences between the groups may have made the comparison between the two groups redundant.

Another explanation for not finding positive outcomes might be the age of the participants. Despite the facts that the use of computers in

Table 2

Primary and secondary outcome measures for the intervention group and control group at baseline.

	Intervention (n = 18)	Control (n = 26)	t-Test
DT: mean (SD)	2.75 (2.42)	2.00 (2.20)	$t = 1.065$, $p = 0.29$ $d = 0.324$
AnxT: mean (SD)	2.69 (2.33)	1.88 (2.35)	$t = 1.127$, $p = 0.26$ $d = 0.346$
DepT: mean (SD)	1.78 (2.51).	1.22 (2.03)	$t = 0.966$, $p = 0.34$ $d = 0.245$
AngT: mean (SD)	1.69 (2.54)	0.88 (2.21)	$t = 1.124$, $p = 0.27$ $d = 0.340$
Need for Help: mean (SD)	1.86 (2.31)	1.08 (1.83)	$t = 1.254$, $p = 0.22$ $d = 0.374$
PCS: mean (SD)	55.87 (10.77)	60.64 (8.05)	$t = -1.682$, $p = 0.10$ $d = 0.501$
MCS: mean (SD)	60.17 (7.82)	62.46 (6.14)	$t = -1.085$, $p = 0.28$ $d = 0.325$
MAX-PC: mean (SD)	14.44 (8.71)	10.47 (8.50)	$t = 1.510$, $p = 0.14$ $d = 0.463$
CCQ-Total: mean (SD)	2.09 (0.57)	1.94 (0.45)	$t = 0.988$, $p = 0.33$ $d = 0.292$
CCQ-Interaction: mean (SD)	2.00 (0.63)	1.89 (0.72)	$t = 0.544$, $p = 0.58$ $d = 0.162$

Table 3

Comparison of the intervention group and control group at the follow-up in regard to the primary and secondary outcomes.

| | Intervention (n = 18) | Control (n = 26) | ANCOVA group (IG vs. CG) | | Covariates | | | |
| | | | | | Baseline | | Any psychosocial support | |
	Marginal mean (s.e.)	Marginal mean (s.e.)	p	η²	p	η²	p	η²
DT	2.93 (0.49)	2.09 (0.40)	0.21	0.039	< 0.001	0.352	0.23	0.035
AnxT	1.72 (0.35)	1.39 (0.29)	0.48	0.012	< 0.001	0.356	0.44	0.015
DepT	1.70 (0.33)	0.94 (0.27)	0.09	0.070	< 0.001	0.527	0.16	0.050
AngT	1.80 (0.31)	0.64 (0.25)	0.01	0.160	< 0.001	0.566	0.03	0.117
Need for Help	1.01 (0.26)	0.84 (0.22)	0.64	0.006	< 0.001	0.548	0.27	0.030
MCS	61.74 (1.43)	63.44 (1.17)	0.39	0.019	< 0.001	0.384	0.35	0.022
PCS	59.72 (0.99)	62.38 (0.81)	0.06	0.088	< 0.001	0.377	0.18	0.045
MAX-PC	10.67 (1.29)	10.81 (1.05)	0.94	0.000	< 0.001	0.645	0.70	0.004
CCQ-TOTAL	1.83 (0.09)	1.94 (0.08)	0.40	0.018	< 0.001	0.570	0.88	0.001
CCQ-Interaction	2.00 (0.11)	1.80 (0.09)	0.13	0.060	< 0.001	0.613	0.12	0.061

Table 4

Control group patients' reasons for not participating in the intervention (N = 26).

| | Control group | |
	N	%
Reasons for not participating in the intervention		
I doubted that the intervention could help me	8	31
I was not interested	8	31
I did not have time	5	19
A chat group is impersonal	4	15
My disease is a private issue	3	12
Technical problems prohibited my participation	2	8
Other	5	19

Table 5

Intervention participants' satisfaction with and acceptance of the intervention (N = 18).

| | Intervention group | |
	N	%
Reasons for participating in the intervention		
Staying in contact with other patients	12	67
Hoping to get new information about prostate cancer	11	61
Talking about problems anonymously	9	50
Staying in contact with the therapist	7	39
Getting to know chat programs and the internet in general	3	17
Others	2	11
Reasons for ending the intervention		
Followed the five offered sessions	6	33
I achieved my goals	3	17
The group sessions were not helpful	2	11
The amount of sessions was limited	2	11
I had no time	1	6
The group session proved that I did not had serious problems	1	6
I can be an inspiration for others because I managed to control my own problems	1	6
Improvements for the chat program		
A doctor should be present	3	17
Smaller groups	3	17
Moderator is missing	1	6
Every participant should have its own profile	1	6
Typing difficulties (too slow)	1	6
I would pay for the chat program	4	22
Would you recommend the chat program to other prostate cancer patients		
I strongly agree/I agree	14	77
I strongly disagree/I disagree	2	11
Undecided	2	11
Would you participate in a chat program again		
I strongly agree/I agree	11	65
I strongly disagree/I disagree	5	29
Undecided	1	6

elderly people increases and that the participants reported no access or any other computer problems during intervention, research on cancer patients still showed that younger patients feel more comfortable using the computer for emotional support and encouragement than older patients and may not be ready to profit from eHealth programs in a way younger patients could (Bouma et al., 2015; Rising et al., 2015). 68 patients reported not wanting to participate in the study because they were not able to use a computer or the internet.

Online interventions can still suffer from patients' low acceptability. However, intervention participants seemed satisfied with the intervention, which does not seem to explain the absence of psychosocial benefits from the intervention. Participants would recommend the chat program to other prostate cancer patients and only 11% of the participants stated that the group sessions were not helpful. These results were consistent with the outcomes of a study which showed that prostate cancer patients have a positive attitude towards eHealth (Jansen et al., 2015). Additionally, participants in our study gave constructive criticism that leaves room for improvements. Participants recommended using "smaller groups" for future use of chat programs in the psychosocial aftercare, which could help to keep the chat interaction structured and productive.

4.1. Limitations

A major limitation of this study was the small amount of participants in the intervention as well as in the control group. Only 44 (11%) participants could be included into the analysis from the 384 patients that have been approached and only 18 patients (5%) participated in the intervention group till follow-up. Recruitment and drop out complication were also reported in four studies who offered psychosocial intervention to prostate cancer patients (Osei et al., 2013; Schover et al., 2012; Wootten et al., 2015; Yanez et al., 2015). However, the problems encountered in this study were more severe. Recruitment

already started in July 2012, but it took more than a year to find enough patients to form a group. Patients who were interested in participating in the study were often lost or lost interest in the study because of the long waiting period. Furthermore, patients reported to not wanting to participate in the study because they felt "not able to use the internet or the computer". Being physically present in the healthcare facility for recruitment, which was thought to increase recruitment numbers after the pilot study, seemed to have no positive impact. For future studies it would be recommendable to improve recruitment and increase response to the questionnaires by using strategies for recruitment (Treweek et al., 2010) and strategies to increase postal and electronic response (Edwards et al., 2009). Possible strategies that

could have been used are regular telephone reminders for non-respondents (Treweek et al., 2010) and an offer of unconditional or monetary incentives (Edwards et al., 2009; Treweek et al., 2010).

Additionally, it would have been beneficial to do a broad non-respondent analysis in order to answer the question why patients did not participate in the study.

5. Conclusions

The findings of this study indicate that web based chat groups may not be an effective way to decrease prostate cancer perceived distress even if the intervention participants seem to accept the intervention.

Furthermore, the current study indicates that even in one of the biggest prostate cancer center worldwide, it can be very difficult to recruit and excite sufficient prostate cancer patients to participate in this online intervention.

Appendix A

Appendix Table A
Intervention participants' evaluation of the chat sessions ($N = 18$).

	Intervention group	
	Mean[a]	SD
Evaluation of the chat sessions		
The exchange with other patients has helped me	2.50	1.04
The support from other patient has helped me	3.28	0.83
The therapist has helped me	2.61	0.92
I got the feeling, that I helped others	2.94	0.80
Focusing on my disease for 1 h a week has helped me	3.06	1.21
Staying in contact with other patients from the clinic, was important to me	3.50	1.30
Staying in contact with the therapist after treatment was important to me	2.72	1.02
The chat sessions had a confidential atmosphere	1.83	0.51
I would have preferred talking to the other patients personally[b]	3.06	1.16
A different group constellation would have helped to solve my problems[b]	3.57	1.18
The chat was too impersonal, to discuss certain problems[b]	3.83	0.92
Problems could not be discussed in detail[b]	2.89	0.96
The chat session had a central topic	2.33	0.91
I could introduce my own topics in the discussion	2.44	0.98
The chat program worked as a bridge between inpatient treatment and daily life	2.06	0.73
Overall, I am satisfied with the chat program	2.44	0.98
I had problems to access the chat program[b]	4.39	0.92
I had computer problems during the chat program[b]	3.95	1.16
I could not type fast enough[b]	4.00	1.14
60 min per session was sufficient	2.06	0.73
One session per week was sufficient	2.06	0.64
Five moderated session were sufficient	2.18	0.71
There were too many participants per chat group[b]	3.78	1.17
I improved my computer skills by participating	4.44	0.71
It is difficult to impress your feelings with smileys (e.g. ☺, ☺)[b]	3.00	1.03

[a] The mean was scored from 1 = 'I strongly agree' to 5 = 'I strongly disagree'.
[b] The negative worded questions are reversed scored.

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