Factors in the prioritization of information needs among Hong Kong Chinese breast cancer patients

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ABSTRACT

Objective: The study aims to examine the prioritization of information needs in breast cancer patients, using the Information Needs Questionnaire (INQ); and to identify the demographic and clinical characteristics associated with that prioritization. **Methods:** A cross-sectional exploratory study was conducted, by means of consecutive sampling. The INQ was used to examine participants' preferences on information needs. Their demographic and clinical characteristics were collected by means of a structured questionnaire and review of medical records. Backward multivariable logistic regression analysis was performed to examine the association between prioritization of patients' information needs and their demographic and clinical characteristics. **Results:** A total of 275 breast cancer patients took part in the analysis. Of the nine INQ items, most participants ranked as their top four needs information about the likelihood of a cure (79%), extent of the disease (76%), treatment options (55%), and family risk of developing breast cancer (51%). Certain demographic and clinical characteristics-religious belief, whether living alone or not, household income, educational level, and time since cancer diagnosis-influenced patients' prioritization of information needs. **Conclusion:** Understanding and meeting the information needs of breast cancer patients are crucial to improving their quality of care. Different patients are likely to have different priorities in information needs according to their demographic and clinical characteristics. An awareness of these associated factors will allow better tailor-made educational interventions to be provided to meet patients' individual needs in a more adequate way.

Key words: Information needs, Chinese, breast cancer, prioritization

Introduction

According to the Hong Kong Cancer Registry, breast cancer is the most common form of the disease among females in Hong Kong, accounting for 26% of all cancer cases and 11% of all cancer-related deaths in 2012.[1] Moreover, the age-standardized incidence of breast cancer has been observed to follow an upward trend over the past two decades.[1] Female life expectancy was reported to be 86.9 years in 2012,[2] and such an extended lifetime increases a woman's cumulative risk of suffering breast cancer.

The technology of cancer treatment is constantly advancing. According to the American Cancer Society,[3] treatment options for breast cancer are no longer limited to surgery, but also include other modalities, such as radiation therapy, chemotherapy, hormonal therapy, targeted therapy, and the latest developments in bone-directed therapy. Such a variety of advanced treatment modalities causes greater information needs among breast cancer patients. In view of the importance of information exchange and treatment decision-making in cancer care, the provision of information is considered to be a crucial element in therapeutic intervention and quality cancer care.[4]

Information acquired allows patients to be actively involved in the decision-making process and to derive greater satisfaction from medical treatment.[5] It has also been found that a mismatch of information needs aggravates emotional distress in breast cancer patients.[6] According to Lam *et al.*,[7] the mismatch between a patient's will and her actual decision-making role is associated with difficulties in that decision-making, lower satisfaction and regret about certain past decisions. A breast cancer patient's ability can be improved by giving her relevant information, in order to cope with the disease and overcome the adverse effects of the treatment process.[8,9] With the provision of such information, patients may be prepared for the forthcoming trials of treatment and rehabilitation, reducing their possible anxiety, and mood disturbances through these phases.[8,9] In addition, providing relevant information to breast cancer patients according to their actual needs can also help to improve communication with their significant others.[10]

Given the ever-increasing number of breast cancer patients, an in-depth investigation of their information needs is certainly warranted to establish effective delivery. Patients at different stages of the disease may have different preferences and priorities as they seek information. There is a dearth of studies examining the association between patients' demographic and clinical characteristics and their information needs. The current study aims to fill this gap by identifying the different needs of breast cancer patients in terms of their demographic and clinical characteristics.

Materials and Methods

Study design, setting and participants

This was a cross-sectional exploratory study. A consecutive sample was recruited from the oncology outpatient department of a large regional hospital in Hong Kong. Patients were considered eligible for inclusion if they were Chinese, female, 18 years or above and with a confirmed diagnosis of breast cancer. Those who could not communicate in Cantonese were excluded.

Data collection procedures

Ethical approval was obtained from the ethics committee of the study hospital before the study began. All eligible participants were approached and invited to join the study by the research staff. Details of the study were explained verbally, and supplemented by an information sheet. Before data collection, written informed consent was obtained from each participant. The research staff then administered the questionnaire in face-to-face interviews, each taking approximately 20 min to complete. Information on patients' demographic and clinical characteristics was collected from their own reports and from a review of medical records.

Instruments

The Information Needs Questionnaire (INQ) developed by Degner *et al.* was used to measure the priority of information needs in breast cancer patients.[11] The INQ consists of nine items on different aspects of these needs. The Thurstone scaling technique[12] was used to determine the extent of preferences among the items, each of which was paired with another item, giving a total of 36 pairs, which were presented according to the Ross matrix of optimal ordering to ensure equal spacing of the items and reduce the possibility of selection bias. The participants were requested to prioritize their preferences among information needs by selecting one of the two items.

The nine items were as follows:
1. How advanced the disease is and how far it has spread
2. The likelihood of cure.
3. How the treatment may affect the patient's ability to carry on her usual social activities.
4. Unpleasant adverse effects of treatment.
5. How family members or close friends may be affected by the disease.
6. Whether the patient's children or other family members are at risk of developing breast cancer.
7. Caring for oneself at home.
8. Different types of treatment and the advantages and disadvantages of each.
9. How the treatment may affect the patient's feelings about her own body or sexual attractiveness.

Demographic and clinical data

A self-developed data sheet was used to collect patients' demographic and clinical information, with items developed according to the recommendations of the National Cancer Institute.[13] The demographic details included the patient's

age, marital status, educational level, etc., while the clinical characteristics covered information about the time since diagnosis, stage of cancer, current treatment regime, etc.

Data analysis

IBM SPSS 22 (IBM Corp., Armonk, NY, USA) was used for data analysis. Appropriate descriptive statistics, including means, standard deviations (SDs), medians, inter-quartile ranges, frequencies, and percentages were used to summarize and present the characteristics of the participants. The Thurstone scaling technique [12] was used to prioritize the nine items. The numbers and percentages of participants choosing each of the items as one of their top-three priorities were tabulated. For each item, the demographic and clinical characteristics of those who chose the underlying item as a top-three priority were compared with those who did not choose such items, using binary logistic regression. Those characteristics with $P < 0.25$ in univariate analysis were selected for backward multivariable logistic regression to identify factors independently associated with the prioritization of each information need the item. All statistical tests involved were two-sided, and the level of significance was set at 5%.

Results

A total of 362 participants completed the INQ, 87 of whom were excluded from data analysis because of the commission of circular triads when rating the preference of information needs, which demonstrated inconsistency in making paired comparisons.[14] This left a total of 275 participants to be included in the analysis.

Demographic and clinical characteristics

The demographic and clinical characteristics of the participants are shown in Table 1. The mean age of participants was 54.5 (SD = 10.6). A majority (75%) were married or cohabitating. The percentage of participants who had received a primary education or lower was 34, while 55% had a secondary level of education and the remainder (11%) postsecondary or above. Most participants (70%) were not employed. The percentage of monthly household income lower than HK$10,000 (1UD$ = 7.8 HK$) was 44, while only 15% of the participants had an income over HK$30,000. Almost half (49%) held a religious belief. Approximately, three-quarters of the participants did not have a family history of cancer, 13% did have such a history, the remainder being unsure. The median time since diagnosis of breast cancer was 11 months. Half the participants were diagnosed at stage II, around a quarter at stage 0 or I, and 19% at stage III or IV. Most (93%) were

Table 1: Demographic and clinical characteristics of the study sample ($n = 275$)

Characteristics	Mean (SD)/median (IQR)/n (%)
Demographic characteristics	
Age (years)[a]	54.5 (10.6)
Marital status	
Single/divorced/widowed	68 (24.9)
Married/cohabitation	205 (75.1)
Education level	
No formal education/primary	92 (33.6)
Secondary	151 (55.1)
Postsecondary or above	31 (11.3)
Full/part-time working	
No	192 (70.3)
Yes	81 (29.7)
Monthly household income (HK$)	
≤10,000	119 (44.2)
10,001-30,000	111 (41.3)
>30,000	39 (14.5)
Living alone	
No	249 (92.6)
Yes	20 (7.4)
Religious belief	
No	139 (51.3)
Yes	132 (48.7)
Family history of cancer	
No	217 (79.2)
Yes	35 (12.8)
Unsure	22 (8.0)
Clinical characteristics	
Time since diagnosis (months)[b]	11 (6-22)
Stage of disease	
0/I	75 (27.4)
II	138 (50.4)
III/IV	52 (19.0)
Unstaged	9 (3.3)
Recurrence	
No	255 (92.7)
Yes	20 (7.3)
Treatment received	
Not started any treatment yet	14 (5.1)
Surgery	23 (8.4)
Chemotherapy/radiation therapy	74 (27.0)
Hormonal therapy	118 (43.1)
Finished all treatment	45 (16.4)

Data marked with [a]presented as mean (SD), [b]Median (IQR), all others are presented as frequency (%). SD: Standard deviation, IQR: Interquartile range

not experiencing a recurrence of the disease. The data on treatment received were divided into "not started any treatment yet" (5%), "surgery" (8%), "chemotherapy/radiation therapy" (27%), "hormonal therapy" (43%), and "finished all treatment" (16%).

Information needs

The top-three priorities among information needs are presented in Table 2. Among the nine items, most

INQ items	Top-three priority *n* (%)
Table 2: The frequency and percentage of each item of INQ judged as the top-three priorities by the participants	
How advanced the disease is and how far it has spread	209 (76.0)
The likelihood of cure	218 (79.3)
How the treatment may affect the patient's ability to carry on her usual social activities	9 (3.3)
Unpleasant adverse effects of treatment	115 (41.8)
How family members or close friends may be affected by the disease	22 (8.0)
Whether the patient's children or other family members are at risk of developing breast cancer	141 (51.3)
Caring for oneself at home	51 (18.5)
Different types of treatment and the advantages and disadvantages of each treatment	150 (54.5)
How the treatment may affect feelings about her own body or sexual attractiveness	19 (6.9)
INQ: Information Needs Questionnaire	

participants ranked information about the likelihood of cure (79%), extent of the disease (76%), and information about treatments options (55%) as their top-three needs, with impact on usual social activities (3%), body appearance (7%), and effect on the patient's nearest and dearest (8%) being the least frequently chosen as top-three priorities.

Demographic and clinical characteristics associated with prioritization of information needs

Since fewer than 10% of the participants ranked as top-three priorities information about the effect of treatment on the ability to continue normal social activities (item 3), the impact of the disease on significant others (item 5), and the impact of treatment on perceptions of the patient's own body or sexual attractiveness (item 9), these areas were excluded from the analysis.

Backward multivariable regression analysis for those variables with $P < 0.25$ in univariate analysis produced no significant difference in participants' demographic and clinical characteristics in respect of prioritizing of items 1 (how advanced the disease is and how far it has spread) and 2 (the likelihood of cure). Other items revealed that patients who held a religious belief wanted more information about any unpleasant adverse effects of treatment than those without such a belief (odds ratio [OR] =1.68, 95% confidence interval [CI]: 1.03-2.73, $P = 0.038$) [Table 3]. Patients who were not living alone (OR = 0.28, 95% CI: 0.10-0.84, $P = 0.022$) and those with a longer interval since cancer diagnosis (OR = 1.49, 95% CI: 1.19-1.87, $P = 0.001$) preferred more information about the risk of their significant others developing breast cancer [Table 4]. On the other hand,

the level of monthly household income played a role in influencing patients' information needs concerned with caring for themselves at home. Patients with higher monthly household incomes were less likely to prioritize information on caring for themselves at home as a top-three choice (OR = 0.15 [95% CI:0.03-0.65], $P = 0.011$) – for those in the highest income group (>HK$30,000) and OR = 0.49 (95% CI: 0.26-0.95), $P = 0.034$ – for the middle income group (HK$10,000-30,000), compared with those in the lowest income group (≤HK$10,000) [Table 5]. Furthermore, patients' educational level and time since diagnosis were both significantly associated with a preference for information on treatment options and their respective advantages and disadvantages. Patients with postsecondary or higher educational attainment, compared with at a primary or lower educational level (OR = 3.61 [95% CI: 1.45-9.01], $P = 0.006$), and shorter time interval since diagnosis (OR = 0.80 [95% CI: 0.65-0.99], $P = 0.039$) showed a greater preference for information on treatment options [Table 6].

Discussion

To the best of our knowledge, the present study is the first to examine the association between prioritization of information needs, using INQ, and the demographic and clinical characteristics of breast cancer patients. Our results indicate that certain demographic and clinical characteristics-religious belief, whether living alone, household income, educational level and time since diagnosis-influence patients' preferences for information.

Although, the information needs of breast cancer patients can theoretically be very diverse, according to background and personal factors, our results show that certain aspects of such needs are common to most patients. Most considered the likelihood of cure as a top-three item (79%) among breast cancer-related information needs, consistent with previous studies, e.g., Luker *et al.*[5] It is natural that most patients would, first of all, be concerned about their chances of a cure, no matter what background they were from. In fact, our analysis also indicates that there is no difference in patient demographic and clinical characteristics in respect of their choice of this aspect as a top-three priority.

How advanced the disease is and how far it has spread was the second most common INQ item that the patients selected as a top-three priority (76%). The studies by Graydon *et al.*[15] also reported that this item was one of the most preferred areas of information among breast cancer

Table 3: Association between the preference of information on unpleasant treatment adverse effects and the demographic and clinical characteristics of breast cancer patients in Hong Kong

Characteristics	Univariate analysis				Multivariable analysis	
	Information on unpleasant treatment adverse effects as the top three priorities		ORU	*P*	ORA (95% CI)	*P*
	No (*n* = 160) (%)	Yes (*n* = 115) (%)				
Demographic characteristics						
Age (years)[a]	54.1 (10.7)	55.1 (10.6)	1.01	0.435		
Marital status						
Single/divorced/widowed (ref)	37 (54.4)	31 (45.6)	1			
Married/cohabitation	121 (59.0)	84 (41.0)	0.83	0.505		
Education level						
No formal education/primary (ref)	50 (54.3)	42 (45.7)	1			
Secondary	95 (62.9)	56 (37.1)	0.70	0.187		
Postsecondary or above	14 (45.2)	17 (54.8)	1.45	0.377		
Full/part-time working						
No (ref)	113 (58.9)	79 (41.1)	1			
Yes	45 (55.6)	36 (44.4)	1.14	0.614		
Monthly household income (HK$)						
≤10,000 (ref)	67 (56.3)	52 (43.7)	1			
10,001-30,000	71 (64.0)	40 (36.0)	0.73	0.237		
>30,000	17 (43.6)	22 (56.4)	1.67	0.169		
Living alone						
No (ref)	145 (58.2)	104 (41.8)	1			
Yes	9 (45.0)	11 (55.0)	1.70	0.254		
Religious belief						
No (ref)	89 (64.0)	50 (36.0)	1		1	
Yes	68 (51.5)	64 (48.5)	1.68	0.038	1.68 (1.03-2.73)	0.038
Family history of cancer						
No/unsure (ref)	139 (58.2)	100 (41.8)	1			
Yes	20 (57.1)	15 (42.9)	1.04	0.909		
Clinical characteristics						
Time since diagnosis (months)[b]	12 (7–22)	9 (3–18)	0.82	0.062		
Stage of disease						
Unstaged/0/I (ref)	42 (50.0)	42 (50.0)	1			
II	83 (60.1)	55 (39.9)	0.66	0.140		
III/IV	34 (65.4)	18 (34.6)	0.53	0.081		
Recurrence						
No (ref)	151 (59.2)	104 (40.8)	1			
Yes	9 (45.0)	11 (55.0)	1.78	0.220		
Treatment received						
Not started any treatment yet (ref)	7 (50.0)	7 (50.0)	1			
Surgery	7 (30.4)	16 (69.6)	2.29	0.238		
Chemotherapy/radiation therapy	46 (62.2)	28 (37.8)	0.61	0.397		
Hormonal therapy	73 (61.9)	45 (38.1)	0.62	0.394		
Fished all treatment	27 (60.0)	18 (40.0)	0.67	0.510		

[a]Mean (SD) and [b]medians (IQR) are presented and log-transformed to correct their skewness when entering into the statistical analyses. ref: Reference group of the categorical variable that analyzed by creating dummy variables, ORU: Univariate odds ratio, ORA: Odds ratio adjusted for other significant factors obtained from backward logistic regression analyses using variables with *P* < 0.25 in univariate analysis as candidate variables, NS: Not statistically significant in multivariate analysis, NE: Not entered into multivariable analysis, IQRs: Interquartile ranges, CI: Confidence interval

patients. In the same way, as the item concerned with the likelihood of a cure, there were no significant demographic and clinical characteristics associated with the choice of this item as a top-three priority. Since information about the spread of the disease is fundamentally important to almost all breast cancer patients, it is quite understandable that no

particular subgroup of patients prefer such information to a greater or lesser extent according to their demographic and clinical background.

Treatment options and their advantages and disadvantages were the third most common item of information needs

Table 4: Association between the preference of information on breast cancer risk of the significant others and the demographic and clinical characteristics of breast cancer patients in Hong Kong

Charateristics	Univariate analysis				Multivariable analysis	
	Information on breast cancer risk of the significant others as the top three priorities		ORU	*P*	ORA (95% CI)	*P*
	No (*n* = 134) (%)	Yes (*n* = 141) (%)				
Demographic characteristics						
Age (years)[a]	54.4 (12.1)	54.7 (9.1)	1.00	0.811		
Marital status						
Single/divorced/widowed (ref)	42 (61.8)	26 (38.2)	1			
Married/cohabitation	91 (44.4)	114 (55.6)	2.02	0.014		
Education level						
No formal education/primary (ref)	39 (42.4)	53 (57.6)	1			
Secondary	75 (49.7)	76 (50.3)	0.75	0.271		
Postsecondary or above	20 (64.5)	11 (35.5)	0.41	0.036		
Full/part-time working						
No (ref)	87 (45.3)	105 (54.7)	1			
Yes	47 (58.0)	34 (42.0)	0.60	0.056		
Monthly household income (HK$)						
≤10,000 (ref)	60 (50.4)	59 (49.6)	1			
10,001-30,000	47 (42.3)	64 (57.7)	1.39	0.220		
>30,000	24 (61.5)	15 (38.5)	0.64	0.229		
Living alone						
No (ref)	117 (47.0)	132 (53.0)	1		1	
Yes	15 (75.0)	5 (25.0)	0.30	0.022	0.28 (0.10-0.84)	0.022
Religious belief						
No (ref)	64 (46.0)	75 (54.0)	1			
Yes	69 (52.3)	63 (47.7)	0.78	0.306		
Family history of cancer						
No/unsure (ref)	121 (50.6)	118 (49.4)	1			
Yes	13 (37.1)	22 (62.9)	1.74	0.139		
Clinical characteristics						
Time since diagnosis (months)[b]	9 (4-15)	13 (8-30)	1.45	0.001	1.49 (1.19-1.87)	0.001
Stage of disease						
Unstaged/0/I (ref)	47 (56.0)	37 (44.0)	1			
II	60 (43.5)	78 (56.5)	1.65	0.072		
III/IV	26 (50.0)	26 (50.0)	1.27	0.499		
Recurrence						
No (ref)	127 (49.8)	128 (50.2)	1			
Yes	7 (35.0)	13 (65.0)	1.84	0.208		
Treatment received						
Not started any treatment yet (ref)	8 (57.1)	6 (42.9)	1			
Surgery	17 (73.9)	6 (26.1)	0.47	0.295		
Chemotherapy/radiation therapy	37 (50.0)	37 (50.0)	1.33	0.625		
Hormonal therapy	50 (42.4)	68 (57.6)	1.81	0.298		
Fished all treatment	21 (46.7)	24 (53.3)	1.52	0.495		

[a]Mean (SD) and [b]medians (IQR) are presented and log-transformed to correct their skewness when entering into the statistical analyses. ref: Reference group of the categorical variable that analyzed by creating dummy variables, ORU: Univariate odds ratio, ORA: Odds ratio adjusted for other significant factors obtained from backward logistic regression analyses using variables with *P* < 0.25 in univariate analysis as candidate variables, NS: Not statistically significant in multivariate analysis, NE: Not entered into multivariable analysis, IQRs: Interquartile ranges, CI: Confidence interval

(55%) that patients ranked as one of their top-three priorities. Unlike the two most preferred items in INQ mentioned above, our results showed that educational level and time since diagnosis did influence preference for this item. In general, those with a higher educational level would be more likely to rank this item as a top-three priority, while those with a longer period since diagnosis would be less likely to do so.

Wallberg *et al.*'s study [16] found that younger and better educated patients tended to prefer a more active role in decisions on treatment options, which is consistent with our

Table 5: Association between the preference of information on caring themselves at home and the demographic and clinical characteristics of breast cancer patients in Hong Kong

Characteristics	Univariate analysis				Multivariable analysis	
	Information on caring themselves at home as the top three priorities		ORU	P	ORA (95% CI)	P
	No (n = 224) (%)	Yes (n = 51) (%)				
Demographic characteristics						
Age (years)[a]	53.8 (10.1)	57.6 (12.5)	1.03	0.023		
Marital status						
Single/divorced/widowed (ref)	57 (83.8)	11 (16.2)	1			
Married/cohabitation	165 (80.5)	40 (19.5)	1.26	0.541		
Education level						
No formal education/primary (ref)	76 (82.6)	16 (17.4)	1			
Secondary	119 (78.8)	32 (21.2)	1.28	0.471		
Postsecondary or above	28 (90.3)	3 (9.7)	0.51	0.311		
Full/part-time working						
No (ref)	152 (79.2)	40 (20.8)	1			
Yes	70 (86.4)	11 (13.6)	0.60	0.163		
Monthly household income (HK$)						
≤10,000 (ref)	87 (73.1)	32 (26.9)	1		1	
10,001-30,000	94 (84.7)	17 (15.3)	0.49	0.034	0.49 (0.26-0.95)	0.034
>30,000	37 (94.9)	2 (5.1)	0.15	0.011	0.15 (0.03-0.65)	0.011
Living alone						
No (ref)	206 (82.7)	43 (17.3)	1			
Yes	13 (65.0)	7 (35.0)	2.58	0.057		
Religious belief						
No (ref)	111 (79.9)	28 (20.1)	1			
Yes	111 (84.1)	21 (15.9)	0.75	0.366		
Family history of cancer						
No/unsure (ref)	193 (80.8)	46 (19.2)	1			
Yes	30 (85.7)	5 (14.3)	0.70	0.483		
Clinical characteristics						
Time since diagnosis (months)[b]	11 (6-18)	12 (6-36)	1.23	0.127		
Stage of disease						
Unstaged/0/I (ref)	73 (86.9)	11 (13.1)	1			
II	111 (80.4)	27 (19.6)	1.61	0.217		
III/IV	39 (75.0)	13 (25.0)	2.21	0.081		
Recurrence						
No (ref)	209 (82.0)	46 (18.0)	1			
Yes	15 (75.0)	5 (25.0)	1.51	0.443		
Treatment received						
Not started any treatment yet (ref)	10 (71.4)	4 (28.6)	1			
Surgery	22 (95.7)	1 (4.3)	0.11	0.066		
Chemotherapy/radiation therapy	57 (77.0)	17 (23.0)	0.75	0.653		
Hormonal therapy	98 (83.1)	20 (16.9)	0.51	0.293		
Fished all treatment	36 (80.0)	9 (20.0)	0.63	0.501		

[a]Mean (SD) and [b]median (IQR) are presented and log-transformed to correct their skewness when entering into the statistical analyses. ref: Reference group of the categorical variable that analyzed by creating dummy variables, ORU: Univariate odds ratio, ORA: Odds ratio adjusted for other significant factors obtained from backward logistic regression analyses using variables with P < 0.25 in univariate analysis as candidate variables, NS: Not statistically significant in multivariate analysis, NE: Not entered into multivariable analysis, IQRs: Interquartile ranges, CI: Confidence interval

own research findings: Patients with a higher educational level are more eager to know more about their treatment options and the associated advantages and disadvantages. The younger and better-educated group of patients believed they were quite capable of understanding the alternative options and making decisions themselves. Wallberg *et al.* also found that most patients turned to a passive form of collaboration whereby they still preferred that their doctor make the final decision on their treatment but while still seriously considering their own opinion.[16] However, patients who had had the disease for a longer period may perhaps already have a certain degree of knowledge of their treatment options and are no longer eager to obtain information on that aspect, not giving it priority.

Table 6: Association between the preference of information on breast cancer treatment options and the demographic and clinical characteristics of breast cancer patients in Hong Kong

Charateristics	Univariate analysis				Multivariable analysis	
	Information on breast cancer treatment options as the top three priorities		ORU	*P*	ORA (95% CI)	*P*
	No (*n* = 125) (%)	Yes (*n* = 150) (%)				
Demographic characteristics						
Age (years)[a]	56.1 (10.7)	53.2 (10.5)	0.97	0.023		
Marital status						
Single/divorced/widowed (ref)	25 (36.8)	43 (63.2)	1			
Married/cohabitation	100 (48.8)	105 (51.2)	0.61	0.086		
Education level						
No formal education/primary (ref)	49 (53.3)	43 (46.7)	1		1	
Secondary	68 (45.0)	83 (55.0)	1.39	0.214	1.57 (0.92-2.67)	0.098
Postsecondary or above	8 (25.8)	23 (74.2)	3.28	0.010	3.61 (1.45-9.01)	0.006
Full/part-time working						
No (ref)	96 (50.0)	96 (50.0)	1			
Yes	29 (35.8)	52 (64.2)	1.79	0.032		
Monthly household income (HK$)						
≤10,000 (ref)	57 (47.9)	62 (52.1)	1			
10,001-30,000	50 (45.0)	61 (55.0)	1.12	0.665		
>30,000	17 (43.6)	22 (56.4)	1.19	0.640		
Living alone						
No (ref)	113 (45.4)	136 (54.6)	1			
Yes	9 (45.0)	11 (55.0)	1.02	0.974		
Religious belief						
No (ref)	64 (46.0)	75 (54.0)	1			
Yes	59 (44.7)	73 (55.3)	1.06	0.824		
Family history of cancer						
No/unsure (ref)	107 (44.8)	132 (55.2)	1			
Yes	18 (51.4)	17 (48.6)	0.77	0.461		
Clinical characteristics						
Time since diagnosis (months)[b]	12 (6-35)	10 (6-16)	0.83	0.072	0.80 (0.65-0.99)	0.039
Stage of disease						
Unstaged/0/I (ref)	39 (46.4)	45 (53.6)	1			
II	60 (43.5)	78 (56.5)	1.13	0.668		
III/IV	26 (50.0)	26 (50.0)	0.87	0.685		
Recurrence						
No (ref)	114 (44.7)	141 (55.3)	1			
Yes	11 (55.0)	9 (45.0)	0.66	0.376		
Treatment received						
Not started any treatment yet (ref)	7 (50.0)	7 (50.0)	1			
Surgery	9 (39.1)	14 (60.9)	1.56	0.518		
Chemotherapy/radiation therapy	32 (43.2)	42 (56.8)	1.31	0.641		
Hormonal therapy	57 (48.3)	61 (51.7)	1.07	0.905		
Fished all treatment	20 (44.4)	25 (55.6)	1.25	0.716		

[a]Mean (SD) and [b]medians (IQR) are presented and log-transformed to correct their skewness when entering into the statistical analyses. ref: Reference group of the categorical variable that analyzed by creating dummy variables, ORU: Univariate odds ratio, ORA: Odds ratio adjusted for other significant factors obtained from backward logistic regression analyses using variables with *P* < 0.25 in univariate analysis as candidate variables, NS: Not statistically significant in multivariate analysis, NE: Not entered into multivariable analysis, IQRs: Interquartile ranges, CI: Confidence interval

Patients who are not living alone but with their families usually want to know more about the risk of family members developing the same disease. As time since diagnosis increases, so their desire to know more about these family risks increases. When they are newly diagnosed, the focus of information needs tends to be more self-related, but as time passes these needs change.

Another interesting finding concerns monthly household income. The lower the income, the more patients are interested in caring for themselves at home. Probably because of a shortage of funds, patients would like to know more about how they could take care of themselves at home. The wealthier group would possibly hire a carer for the home, when the need for such information would

become less pressing. Interestingly, patients who hold a religious belief want more information about unpleasant adverse effects of treatment-findings not reported before.

Regardless of the treatment option, the information needs of women suffering from breast cancer only have minor variations. Graydon *et al.*[15] reported that the information needs of women during early treatment for breast cancer were strong, directed toward information about their disease, treatment and investigative tests, and specifically dealt with the chance of recurrence. However, our study indicated that, even when patients have undergone different kinds of treatment, they are not so desirous of acquiring information on their disease and its treatment, or even on caring for themselves at home. This is probably because, once patients have been diagnosed with breast cancer, information is given universally to them all. Since that information is adequate and nonspecific, even patients undergoing different forms of treatment are still satisfied.

The study has several limitations. First, it was a cross-sectional type measuring both dependent and independent variables at a single point in time, and no causal relationships can be confirmed for the association between preferences for information items and identified demographic and clinical characteristics. Second, with a self-reported questionnaire, as adopted in this study, potential self-recall bias or inaccuracy may occur when participants fail to complete the questionnaires or do so incorrectly in some way.[17] Finally, a convenience sampling method was used to recruit participants from a single local hospital, and the findings may not therefore be generalizable to all Hong Kong Chinese breast cancer patients. As it is, the information needs items were confined by the INQ, and there are other aspects of information needs not covered by the instrument. The study findings may not therefore completely reflect the whole picture, further affecting the external validity of the results. Further studies are clearly needed before the present findings can be confirmed.

Conclusion

Understanding and meeting the information needs of breast cancer patients are crucial to improving the quality of care they receive. Different patients are likely to have different priorities in information needs according to their demographic and clinical background. Our study findings indicate that certain demographic and clinical characteristics among Hong Kong Chinese breast cancer patients-religious belief, whether living alone, household income, educational level and time since diagnosis-influence their preferences for information needs. An awareness of these associated factors will allow better tailor-made educational interventions to be provided to meet patients' individual needs more adequately.

Conflicts of interest

There are no conflicts of interest.

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