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Unmet psychological and practical needs of patients with cancer in rural and remote areas of Western Australia

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ABSTRACT

Introduction: The financial and psychological impacts of cancer treatment on patients can be severe. Practical issues, such as childcare, medical supplies and obtaining 'home help' can impose financial strain on patients and their families, and this is often exacerbated by a simultaneous loss of income if a patient is unable to continue employment during treatment, or if family members become full-time carers. These financial difficulties are often more severe for patients from rural regions because cancer services tend to be concentrated in metropolitan areas, requiring rural patients to relocate or undertake lengthy, frequent commutes to access treatment. The needs of rural cancer patients may differ from and exceed those of metropolitan cancer patients. Because of this, it is important to assess the needs of rural and metropolitan populations to develop appropriate, tailored supportive-care interventions. This article compares the unmet supportive-care needs of rural/remote with metropolitan cancer patients in Western Australia (WA), a large and sparsely populated Australian state with a substantial rural and remote population. This article is part of a larger program of research assessing the supportive-care needs of WA cancer patients.

Methods: Participants were identified through the Western Australian Cancer Registry (WACR) and considered eligible if diagnosed with any type of cancer between 6 months and 2 years previously. A random sample of 2079 potential participants was generated, structured to include all cancer types and geographical areas, and with both sexes randomised within these groups. Following confirmation and exclusion of deceased patients and those patients excluded at the treating doctor's request, 1770 patients were contacted. Participants were asked to complete a demographic questionnaire and the Supportive Care Needs Survey Long Form (SCNS-59). Data from participants who completed and returned both questionnaires were analysed using descriptive statistics and χ^2 tests; and any missing data were addressed through imputation.

Results: Eight hundred and twenty-nine participants (47% response) completed the SCNS-LF59 and 786 (94.8%) completed both questionnaires. Of the 786 respondents, 234 (30%) were from rural areas and 169 (22%) were from remote areas. Among the 15 items with the highest frequency for 'some needs' on the survey, participant needs did not vary by geographical location, with no significant differences found for any of the 15 items. The item for which the greatest, albeit non-significant ($p = 0.12$) difference was seen, was 'concern about financial situation'. The differences among all other items were not significant (p-values from 0.28 to 0.96). Furthermore, the proportion of participants reporting 'moderate to high need' on these items also did not differ significantly across geographical populations (p-values from 0.13 to 0.91).

Conclusions: The lack of discrepancy between rural, remote and metropolitan cancer patients' unmet needs provides a positive message regarding the state of WA cancer services and the level of support provided to rural and remote WA residents. Future research should also assess the unmet needs of rural and remote carers and families in comparison with metropolitan carers and families, to ensure that services are well-equipped to meet the needs of all individuals involved in a patient's cancer journey.

Key words: cancer supportive care needs, supportive care needs survey, unmet needs, Western Australia.

Introduction

Cancer treatments can impose significant psychological and financial burdens on patients for a number of reasons. Financial issues are a common problem for cancer patients, because support is required for medical procedures, services such as physiotherapy and counselling, prostheses, aides, travel and accommodation, along with other practical issues such as child care and 'home help', to name a few. These increased financial requirements may also be coupled with a loss of income, and concerns about financial issues and how to access relevant information, which may influence a patient's treatment and wellbeing.

Such concerns are exacerbated for cancer patients from rural and remote areas, where treatment requires frequent travel to the city. While metropolitan and rural cancer patients have similar needs, higher cancer-related burdens and geography has been identified as a factor for rural patients[1]. A substantial financial burden accompanies the relocation for treatment, including unexpected costs such as telephone calls, laundry services and pharmaceutical products[2]. In addition to the financial costs of temporary relocations during treatment, rural families often need to maintain households in two locations while facing a loss of income when a family member is unable to work[3]. Because rural patients are no longer at home, the patients' (or carers') responsibilities fall to other family members, imposing additional stress and burdens on the family members who have stayed behind. Patients may also experience difficulties if they travel alone, including paying medical expenses and coping with treatment side-effects in a new environment[4]. The isolation of being in a new environment is also a challenge, and although patients may be able to build a network during their stay in the city, it is lost on their return to the rural area, leading to new feelings of isolation[5]. Relocation for treatment causes significant disruption in the lives of rural patients[6,7].

In order to avoid the difficulties associated with relocation, or because they cannot afford relocation, some rural patients travel back and forth on a daily basis[8]. Additional travel can cause fatigue and stress[8], and the treatment side-effects may also make travelling especially difficult and stressful[9]. Travel and time costs have been identified as factors in rural women having comparatively lower rates of use of breast-conserving therapy[10], and mastectomy may be chosen over adjuvant therapy in order to accelerate the woman's return home[11].

Although financial assistance may be available to mitigate the impact of relocation, patient awareness about such support is not always high[7,12] and financial assistance may not fully cover the substantial costs associated with treatment relocation[12]. Rural patients also report other practical needs, including the need for information[2] and medical support[13]. These issues are of concern for large, sparsely populated countries such as Australia, in which 29% of the population lives in rural and remote areas.

In this article, the results of a large survey of the supportive care needs of cancer patients in Western Australia (WA), a large, sparsely populated Australian state, are reported. At the time of the study, the state capital Perth was the only major centre in the state providing cancer services. The geography of WA impacts on residents' access to services and the travel costs associated with this access. This article explores the relationship between the unmet psychological and practical support needs of WA cancer patients and geographic location. Other aspects of the survey, including the identification and comparison of unmet needs across cancer sub-groups (eg lung, breast, prostate), will be reported elsewhere.

Methods

Participant recruitment

A random sample of 2079 potential participants was generated at the Western Australian Cancer Registry (WACR). The sample was structured to include all cancer types and geographical areas and with both sexes and randomised within these groups. Participants were considered eligible if they had been diagnosed with cancer between 6 months and 2 years previously. Throughout the recruitment process, a number of death registry checks were undertaken to ensure there was no attempt to contact deceased patients. Treating doctors for the potential participants were identified from WACR records and mailed a letter, a brief précis of the study, a list of their patients to be contacted and a reply paid envelope, as per ethics committee requirements. After the initial mail-out, doctors who did not respond (51%) were sent a reminder letter, with an accompanying list of patients and a reply paid envelope. In this letter, doctors were advised that the research team regarded non-response as indication that they could contact the doctor's patients.

Following these steps, 1770 participants were mailed a letter of invitation, information sheet, 2 questionnaires, WACR pamphlet and a reply paid envelope. The WACR pamphlet explained the function of the registry, how their names were included on the registry, and the process that WACR had undertaken to identify their name for an invitation to participate in the study.

All participants were fully informed of the purpose and procedures of the study and consent was assumed where surveys were returned. Ethics approval for the study was obtained from the Edith Cowan University Ethics Committee and the Confidentiality of Health Information Committee (CHIC).

Survey measures

The Long Form Supportive Care Needs Survey: The Long Form Supportive Care Needs Survey (SCNS-LF59) was used in this survey. The SCNS-LF59 is a reliable (Cronbach's α of 0.87–0.97 for the 5 scales identified with principal components analysis) and valid (face, content and construct validity)[14] self-administered instrument for measuring global needs in cancer patients. The SCNS-LF59 needs assessment tool was developed in Australia and is widely used within the Australian context[15-17]. It takes approximately 20 min to complete and can be understood by people with minimal reading ability[15].

The SCNS-LF59 consists of 59 items with 5 domains: (i) psychological; (ii) health system and information; (iii) physical and daily living; (iv) patient care and support; and (v) sexuality. For each item, participants are asked to circle their level of need for help over the last month on a scale of 1 to 5 (1 = not applicable, 2 = satisfied, 3 = low need, 4 = moderate need, 5 = high need). The questionnaire distinguishes 'some need' by combining scores for low, moderate and high needs, as opposed to 'no need' (the combination of scores for not applicable and satisfied).

Needs assessments offer advantages over other methodologies because they address both quality of life and quality of care issues, and enable direct evaluation of patients' perceived needs for help, thus providing indication of needed resources[14]. Identification of the magnitude of the needs is also possible, thereby allowing individuals and subgroups with higher levels of needs to be identified and targeted with appropriate early intervention, reduction of problems and prioritisation of support.

Demographic questionnaire: A demographic questionnaire was also administered to ascertain participant characteristics including sex, cultural background, educational attainment and employment status.

Assessment of remoteness: To determine metropolitan, rural and remote areas within the study, the Australian Bureau of Statistics (ABS) remoteness classes were adapted[18] using the ABS classifications which range from 0 to 4 (0 = major cities, 1 = inner regional, 2 = outer regional, 3 = remote, 4 = very remote). For this study, these classifications were collapsed into 3 categories: (i) metropolitan (ABS classification 0); (ii) rural/regional (ABS classifications 1 and 2); and (iii) remote (ABS classifications 3 and 4). Because numbers were comparatively smaller in the rural and remote categories, the suitability of collapsing the categories into metropolitan/rural/remote rather than metropolitan/rural and remote was checked by re-running the analyses with the latter approach to categorisation. This re-categorisation did not change any of the findings and so the original categorisation was retained.

Data analysis

Only participants who had returned a completed demographic questionnaire and the SCNS-LF59 were included in the final analysis. Missing data were dealt with by imputing the mean score for the variable to replace the missing values. Basic frequencies and percentages were tabulated. The primary analysis was a comparison of proportions reporting 'some need' versus 'no need' across groups for the 15 highest-rated items for 'some need', undertaken with χ^2-tests with a p-value of 0.05 used as the measure of significance. Because other researchers have suggested dichotomising the variables to 'moderate to high need' and 'low to no need'[15,19], proportions were compared using this dichotomy but with a corrected p-value of 0.01 due to the number of tests undertaken. Finally, although the 15 highest-rated items across the sample were generally the highest-rated items for each geographical group, some items appeared in some groups that did not appear elsewhere, and so χ^2-tests for these items (with $p = 0.01$ as the α value) were undertaken.

Results

Participants

Of the 1770 individuals sent a letter, information sheet, WACR brochure and questionnaires, 829 (47%) returned questionnaires, implying consent. Only participants who returned both the completed demographic questionnaire and the SCNS-LF59 ($n = 786$; 94.8%) were included in the final analysis. The sample consisted of 382 males and 398 females (6 demographic questionnaires had these data missing); demographic data for participants are provided (Table 1).

Table 1: Participant characteristics (valid percentage in parentheses)

Characteristic	**Total** ***n* (%)** ***N*=786**	**Location** ***n* (%)**		
		Metro ***N*=383**	**Rural** ***N*=234**	**Remote** ***N*=169**
Age, mean years (range)	62.8 (22-100)	62.2 (23-100)	64.8 (22-94)	61.6 (22-100)
Sex				
Male	382 (49.0)	177 (46.5)	120 (51.7)	85 (50.9)
Female	398 (51.0)	204 (53.5)	112 (48.3)	82 (49.1)
Years in Australia				
Born in Australia	532 (68.4)	237 (62.4)	160 (69.3)	135 (80.8)
Born elsewhere: *n* years in Australia				
1–20	40 (16.6)	30 (21.3)	6 (8.8)	4 (12.5)
21–40	114 (47.3)	61 (43.3)	36 (52.9)	17 (51.5)
≥41	87 (36.1)	50 (35.5)	26 (38.2)	11 (33.3)
Cultural background				
Not Aboriginal/Torres Strait Islander	603 (81.3)	282 (78.1)	178 (80.9)	143 (88.8)
Aboriginal/Torres Strait Islander	7 (0.9)	1 (0.3)	2 (0.9)	4 (2.5)
English is primary language	753 (98.0)	362 (96.8)	228 (99.1)	163 (99.4)
Highest educational level				
Secondary school (up to year 12)	408 (53.3)	190 (50.5)	125 (55.1)	93 (57.4)
Trade/ Vocational education certificate	185 (24.2)	88 (23.4)	59 (26.0)	38 (23.5)
University degree (incl. postgraduate)	148 (19.3)	81 (21.5)	40 (17.6)	27 (16.7)
Other	17 (2.2)	14 (3.7)	2 (0.9)	1 (0.6)
Undefined/don't know	7 (0.9)	3 (0.8)	1 (0.4)	3 (1.9)
Employment status (last 12 months)				
Full-time or self-employed	207 (27.0)	94 (25.1)	51 (22.3)	62 (38.0)
Part-time or casual	124 (16.2)	66 (17.6)	28 (12.2)	30 (18.4)
Retired/pensioner (incl. disability pension)	336 (43.8)	164 (43.7)	124 (54.1)	48 (29.4)
Not working (incl. housewife)	86 (11.2)	46 (12.3)	22 (9.6)	18 (11.0)
Other	14 (1.8)	5 (1.3)	4 (1.7)	5 (3.1)
Employment status is the same as above				
Yes	621 (90.9)	300 (90.1)	188 (93.5)	133 (89.3)
No	62 (9.1)	33 (9.9)	13 (6.5)	16 (10.7)

Metro, Metropolitan.

The proportions of participants who were male of Aboriginal/Torres Strait Islander background and spoke English as their primary language were similar across geographic groups. A majority of participants in each group were born in Australia, although this proportion was highest in the remote location group. Proportions were also similar in terms of educational attainment, with a majority in each group completing some form of secondary schooling. Although nearly all participants in each group held the same employment status as they had held for the previous 12 months, this varied across groups with the remote group having the largest proportion of self-employed or full-time workers and the smallest proportion of retirees or pensioners.

The distribution of cancer subgroups across the sample is presented (Table 2). The percentage of participants reporting each cancer type was similar across metropolitan, rural and remote areas.

Table 2: Number of participants in each cancer subgroup for the total sample and according to location (valid percentage in parentheses)

Cancer subgroup	**Total** ***n* (%)** ***N*=786**	**Location** ***n* (%)**		
		Metro ***N*=383**	**Rural** ***N*=234**	**Remote** ***N*=169**
Breast (female)	169 (21.5)	83 (21.7)	46 (19.7)	40 (23.7)
Prostate (male)	161 (20.5)	75 (19.6)	46 (19.7)	40 (23.7)
Colorectal	93 (11.8)	47 (12.3)	26 (11.1)	20 (11.6)
Melanoma of skin	90 (11.5)	42 (11.0)	28 (12.0)	20 (11.8)
Lymphoma	28 (3.6)	12 (3.1)	12 (5.1)	4 (2.4)
Lung, bronchus & trachea	25 (3.2)	12 (3.1)	9 (3.8)	4 (2.4)
Thyroid, adrenal & other endocrine	23 (2.9)	12 (3.1)	7 (3.0)	4 (2.4)
Head & neck	22 (2.8)	11 (2.9)	7 (3.0)	4 (2.4)
Ovary (female)	17 (2.2)	9 (2.3)	4 (1.7)	4 (2.4)
Kidney	16 (2.0)	9 (2.3)	5 (2.1)	2 (1.2)
Uterus (female)	14 (1.8)	4 (1.0)	5 (2.1)	5 (3.0)
Peripheral nerves, peritoneum & soft tissues	14 (1.8)	8 (2.1)	4 (1.7)	2 (1.2)
Leukaemia	12 (1.5)	7 (1.8)	4 (1.7)	1 (0.6)
Bladder & other urinary	12 (1.5)	6 (1.6)	1 (0.4)	5 (3.0)
Other lymphohaematopoietic neoplasms	12 (1.5)	5 (1.3)	5 (2.1)	2 (1.2)
Myeloma	12 (1.5)	5 (1.3)	4 (1.7)	3 (1.8)
Central nervous system & spinal cord	10 (1.3)	5 (1.3)	2 (0.9)	3 (1.8)
Mesothelioma	9 (1.1)	4 (1.0)	4 (1.7)	1 (0.6)
Unknown primary site	8 (1.0)	5 (1.3)	2 (0.9)	1 (0.6)
Gastro-oesophageal	8 (1.0)	5 (1.3)	3 (1.3)	0
Lip	8 (1.0)	4 (1.0)	3 (1.3)	1 (0.6)
Testis & other male genital	6 (0.8)	3 (0.8)	2 (0.9)	1 (0.6)
Non-melanoma skin cancer	6 (0.8)	1 (0.3)	4 (1.7)	1 (0.6)
Hepato-biliary, pancreatic & small intestine	4 (0.5)	4 (1.0)	0	0
Other female genital	4 (0.5)	2 (0.5)	1 (0.4)	1 (0.6)
Cervix (female)	3 (0.4)	3 (0.8)	0	0

Metro, Metropolitan.

Unmet needs

As reported elsewhere, at least 20% of the participant sample identified 15 items where they had 'some needs' and the item with the highest number of participants (41%) reporting 'some needs' was 'fears about the cancer returning'[20]. The 15 items with the highest frequency on the SCNS-LF59 survey for 'some needs' were compared according to participants' location (metropolitan, rural or remote; Table 3).

There were no statistically significant differences between the response from individuals in the metropolitan, rural and remote areas for any of the top 15 'some needs' items, with p-values of at least 0.20 seen for all items except 'concern about financial situation' (p = 0.12).

As noted, the top 15 'some needs' items were then compared in terms of 'moderate to high need' against 'low to no need'. No significant differences were found among individuals in metropolitan, rural and remote areas with this comparison (Table 4).

No statistically significant differences were found, and although p-values were smaller than when the variables were dichotomised as 'some to high need'/'no need', all p-values exceeded 0.10.

Table 3: Frequencies for fifteen highest 'some needs' items reported according to participants' location (valid percentage in parentheses)

Rank	Item	Total *n* (%) *N*= 786	Location *n* (%) Metro *N*= 383	 Rural *N*=234	 Remote *N*=169	Statistical findings†
1	Fears about the cancer returning (Psychological)	321 (40.8)	158 (41.3)	87 (37.2)	76 (45.0)	χ^2=2.52 (p=0.28)
2	Fears about the cancer spreading (Psychological)	296 (37.7)	150 (39.2)	80 (34.2)	66 (39.1)	χ^2=1.71 (p=0.43)
3	Concerns about the worries of those closest to you (Psychological)	261 (33.2)	122 (31.9)	86 (36.8)	53 (31.4)	χ^2=1.90 (p=0.39)
4	Lack of energy and tiredness (Physical& Daily Living)	249 (31.7)	122 (31.9)	75 (32.1)	52 (30.8)	χ^2=0.09 (p=0.96)
5	Not being able to do the things you used to do (Physical& Daily Living)	241 (30.7)	113 (29.5)	80 (34.2)	48 (28.4)	χ^2=2.02 (p=0.37)
6	Uncertainty about the future (Psychological)	239 (30.4)	116 (30.3)	68 (29.1)	55 (32.5)	χ^2=0.57 (p=0.75)
7	Not sleeping well (Physical & Daily Living)	224 (28.5)	105 (27.4)	70 (29.9)	49 (29.0)	χ^2=0.47 (p=0.79)
8	Anxiety (Psychological)	223 (28.4)	104 (27.2)	69 (29.5)	50 (29.6)	χ^2=0.55 (p=0.76)
9	Feeling down or depressed (Psychological)	223 (28.4)	101 (26.4)	73 (31.2)	49 (29.0)	χ^2=1.71 (p=0.43)
10	Fears about physical disability or deterioration (Psychological)	211 (26.8)	103 (26.9)	66 (28.2)	42 (24.9)	χ^2=0.56 (p=0.76)
11	Changes in sexual feelings (Sexuality)	201 (25.6)	100 (26.1)	60 (25.6)	41 (24.3)	χ^2=0.21 (p=0.90)
12	Feelings of sadness (Psychological)	193 (24.6)	92 (24.0)	58 (24.8)	43 (25.4)	χ^2=0.14 (p=0.93)
13	Worry that the results of treatment are beyond your control (Psychological)	175 (22.3)	87 (22.7)	56 (23.9)	32 (18.9)	χ^2=1.50 (p=0.47)
14	Concerns about your financial situation (No domain)	173 (22.0)	94 (24.5)	41 (17.5)	38 (22.5)	χ^2=4.20 (p=0.12)
15	Feelings about death and dying (Psychological)	172 (21.9)	90 (23.5)	48 (20.5)	34 (20.1)	χ^2=1.15 (p=0.56)

Metro, Metropolitan.
†DF = 2.

As noted, the top 15 'some needs' items were then compared in terms of 'moderate to high need' against 'low to no need'. No significant differences were found among individuals in metropolitan, rural and remote areas with this comparison (Table 4).

No statistically significant differences were found, and although *p*-values were smaller than when the variables were dichotomised as 'some to high need'/'no need', all *p*-values exceeded 0.10.

Finally, the top 15 'some needs' were listed and compared across each geographical group of participants and 5 additional needs (not included in the original list) were identified. These were 'Being informed about things you can do to help yourself get well', 'Work around the home', 'Changes to your usual routine and lifestyle', 'Anxiety about having any treatment' and 'Changes in your sexual relationships'. No significant differences were identified for the proportion of participants reporting 'some needs' for each of these items (Table 5).

Table 4: Comparison of proportions reporting moderate to high needs on top fifteen 'some needs' items, according to participants' location (valid percentage in parentheses)

Rank	Item	Total *n* (%) *N*=786	Location *n* (%)			Statistical findings†
			Metro *N*= 383	Rural *N*=234	Remote *N*=169	
1	Fears about the cancer returning (Psychological)	169 (21.5)	92 (24.0)	41 (17.5)	36 (21.3)	χ^2=3.64 (p=0.16)
2	Fears about the cancer spreading (Psychological)	162 (20.6)	87 (22.7)	40 (17.1)	35 (20.7)	χ^2=2.81 (p=0.25)
3	Concerns about the worries of those closest to you (Psychological)	152 (19.3)	75 (19.6)	48 (20.5)	29 (17.2)	χ^2=0.74 (p=0.69)
4	Lack of energy and tiredness (Physical& Daily Living)	129 (16.4)	56 (14.6)	48 (20.5)	25 (14.8)	χ^2=4.09 (p=0.13)
5	Not being able to do the things you used to do (Physical& Daily Living)	131 (16.7)	63 (16.4)	41 (17.5)	27 (16.0)	χ^2=0.19 (p=0.91)
6	Uncertainty about the future (Psychological)	119 (15.1)	54 (14.1)	32 (13.7)	33 (19.5)	χ^2=3.25 (p=0.20)
7	Not sleeping well (Physical & Daily Living)	120 (15.3)	52 (13.6)	44 (18.8)	24 (14.2)	χ^2=3.26 (p=0.20)
8	Anxiety (Psychological)	112 (14.2)	54 (14.1)	39 (16.7)	19 (11.2)	χ^2=2.38 (p=0.31)
9	Feeling down or depressed (Psychological)	101 (12.8)	50 (13.1)	31 (13.2)	20 (11.8)	χ^2=0.20 (p=0.90)
10	Fears about physical disability or deterioration (Psychological)	124 (15.8)	57 (14.9)	41 (17.5)	26 (15.4)	χ^2=0.79 (p=0.68)
11	Changes in sexual feelings (Sexuality)	116 (14.8)	54 (14.1)	38 (16.2)	24 (14.2)	χ^2=0.58 (p=0.75)
12	Feelings of sadness (Psychological)	96 (12.2)	50 (13.1)	28 (12.0)	18 (10.7)	χ^2=0.65 (p=0.72)
13	Worry that the results of treatment are beyond your control (Psychological)	91 (11.6)	43 (11.2)	31 (13.2)	17 (10.1)	χ^2=1.06 (p=0.59)
14	Concerns about your financial situation (No domain)	112 (14.2)	62 (16.2)	25 (10.7)	25 (14.8)	χ^2=3.65 (p=0.16)
15	Feelings about death and dying (Psychological)	81 (10.3)	43 (11.2)	24 (10.3)	14 (8.3)	χ^2=1.10 (p=0.58)

Metro, Metropolitan.
†DF = 2.

Although there was some variation in terms of which items appeared on the list of top 15 items for each geographically divided group of participants, the differences were small and all *p*-values exceeded 0.30.

Discussion

The perceived unmet needs of participants in the current study did not differ significantly according to geographical location. This finding is surprising, as it might have been expected that the lower levels of primary health care and supportive-care services in rural and remote WA would adversely impact the unmet needs of cancer patients[2]. Furthermore, a previous study assessing the needs of breast cancer patients found that location was predictive of higher needs for the 'physical' and 'daily living' domains[21]. A possible explanation is that the informal support structures (eg friends and families) that exist in rural communities provide a significant source of support to rural cancer patients[22,23] and may contribute to reducing patients' unmet needs.

Table 5: Comparison of proportions reporting 'some needs' for select items according to participants'location (valid percentage in parentheses)

Item	Total *n* (%) *N*=786	Location *n* (%)			Statistical findings†
		Metro *N*=383	Rural *N*=234	Remote *N*=169	
Being informed about things you can do to help yourself get well (Health System & Information)	168 (21.4)	89 (23.2)§	45 (19.2)	34 (20.1)	χ^2=1.59 (p=0.45)
Work around the home (Physical & Daily Living)	162 (20.6)	74 (19.3)	55 (23.5)§	33 (19.5)	χ^2 =1.71 (p=0.43)
Changes to your usual routine and lifestyle (Psychological)	171 (21.8)	81 (21.1)	55 (23.5)§	35 (20.7)	χ^2=0.61 (p=0.74)
Anxiety about having any treatment (Psychological)	163 (20.7)	72 (18.8)	51 (21.8)	40 (23.7)§	χ^2=1.92 (p=0.38)
Changes in your sexual relationships (Sexuality)	169 (21.5)	84 (21.9)	48 (20.5)	37 (21.9)§	χ^2=0.19 (p=0.91)

Metro, Metropolitan.
†DF = 2; § indicates geographical group for which this item appeared in the top fifteen list of 'some needs'.

Although needs did not differ among metropolitan, rural and remote participants, our study identified that 'fear regarding the recurrence of cancer', 'psychological concerns' and 'financial concerns' were areas of need for Australian rural patients, and this is consistent with previous research[24]. Our findings are also consistent with a survey of rural women with breast cancer in Tasmania employing the Supportive Care Needs Survey which found moderate to high needs in the psychological and physical domains and few needs in the health system and information domain[25]. The authors of the Tasmanian study suggested this was because breast nurses improved supportive-care access and thus met patient needs in that domain[25]. Similarly, a 2008 study of rural and metropolitan cancer patients in WA found that both groups were satisfied with the quality of care, although rural patients wanted more information[26]. In another study, cancer nurse coordinators and cancer support workers were identified as playing a key role in improving care for rural WA cancer patients, specifically by improving patients' information and knowledge regarding accessible services and by decreasing the fragmentation of care[27]. Thus, another explanation for the present study finding of lack of difference in unmet needs across rural and urban populations may be that cancer services in WA were meeting the needs of patients in rural and remote areas.

Study strength and limitations

One of the strengths of this study is that it directly compared the unmet needs of rural, remote and metropolitan populations using a validated and reliable measure. However, this study also had several limitations. Participant numbers for some of the cancers were small and therefore results cannot be generalised to all cancer populations. Only participants who had English literacy skills sufficient to enable them to read and respond to a written questionnaire were considered eligible, potentially resulting in a non-representative sample of the socioeconomic population in WA. This may have particular implications for the findings relating to financial needs. Other limitations relating to the SCNS have been discussed elsewhere[20].

Conclusions

The results of the present study provide important information about perceived unmet needs among remote, rural and metropolitan cancer patients in WA, which can guide the development of interventions to meet those needs. The lack of discrepancy among the three populations provides a positive message regarding the state of WA cancer services in rural areas, and the level of support provided to rural WA residents. In light of previous studies identifying high levels of need among remote carers, particularly in terms of health systems and information[16], conducting a survey of the unmet needs of rural and remote carers would be an appropriate next step to ensure that cancer services are well equipped to meet the needs of all individuals involved in a patient's cancer journey.

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