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Assessment of patient and caregiver needs in fragile X-associated tremor/ataxia syndrome (FXTAS) by utilizing Q-sort methodology

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Abstract

Objectives—Psychosocial stressors faced by patients with fragile X-associated tremor/ataxia syndrome (FXTAS) and their caregivers have not been systematically explored. FXTAS is a neurodegenerative disease occurring in approximately 45% of elderly male carriers and 8–16% of female carriers of the *FMR1* premutation. This study investigated subjective needs of patients with FXTAS and their family caregivers, by utilizing Q-sort methodology.

Method—Patients with FXTAS and their caregivers seen during January 2005 to June 2007 participated. The Q-sort was composed of 17 (8 formal, 9 informal) items, designed to explore emotional, informational, and instrumental needs of patients with FXTAS and their caregivers. Item scores were generated, from 1= least important, to 7 = most important. Analysis included descriptive statistics for all the demographic and outcome variables. Generalized estimating equations were used to identify which of the need domains were perceived as most important by the participants.

Results—24 patients (79% men, mean age 65.6 ± 6.4 years) with FXTAS and 18 caregivers (11% men, mean age 63.6 ± 6.2 years) completed the Q-sort. Both patients and caregivers rated informational needs as most important, followed by emotional and, lastly, by instrumental needs. Participants lacked many important resources, in particular those addressing instrumental needs.

Conclusion—Providers should be educated and able to provide timely information and referrals to formal services, as well as to informal resources, including the National Fragile X Foundation online support network (www.fragilex.org).

Keywords

family caregivers; FXTAS dementia; psychosocial stressors; fragile X

Introduction

Fragile X-associated tremor ataxia syndrome (FXTAS) is a neurodegenerative disorder affecting adults who carry the Fragile X Mental Retardation 1 (*FMRI*) gene premutation with CGG trinucleotide repeat size ranging from 55 to 200 (Jacquemont et al., 2003; Hagerman & Hagerman, 2004). FXTAS affects approximately 45% of older male carriers and 8%–16% of female carriers (Coffey et al., 2008; Jacquemont et al., 2004; Rodriguez-Revenga et al., 2009). Onset of neurological symptoms is usually between 50 and 70 years of age, with a variable time interval between the occurrence of motor features and cognitive changes (Jacquemont et al., 2004; Leehey et al., 2007). Women premutation carriers may present with peripheral neuropathy, hypertension, thyroid disease, and fibromyalgia (Coffey et al., 2008; Hagerman et al., 2004). Additionally, up to 20% of female premutation carriers develop primary ovarian insufficiency (Allingham-Hawkins et al., 1999; Rodriguez-Revenga et al., 2009). Psychiatric features in premutation carriers of both genders have been described, including anxiety and depressive symptoms, personality change, disinhibition, and irritability (Bourgeois et al., 2007; Hessler et al., 2005; Roberts et al., 2009; Rodriguez-Revenga, Madrigal, Montserrat, Santos, & Montserrat, 2008). A recent review of psychiatric diagnoses in premutation carriers revealed a significantly higher lifetime prevalence of social phobia, when compared with controls from the National Comorbidity Survey Replication (NCS-R) (Bourgeois et al., in press). Individuals with FXTAS had a 65% lifetime prevalence of mood disorders and 52% rate of anxiety disorders, as well as a significantly higher prevalence of major depressive disorder, panic disorder, specific phobia, and posttraumatic stress disorder when compared with NCS-R controls (Bourgeois et al., in press).

The FXTAS-associated dementia combining cortical and subcortical features has been described (Bacalman et al., 2006; Seritan et al., 2008). Executive dysfunction is a prominent impairment, and also appears to mediate other cognitive deficits (Brega et al., 2008). Typically, tremor and ataxia precede the cognitive changes by a variable time interval, ranging from 1 to 13 years, although cognitive impairment may occur before any motor symptoms are noted (Seritan et al., 2008; Sévin et al., 2009). Dementia is more common in men and occurs late in the course of the illness. When women develop FXTAS, they typically have less severe cognitive deficits and milder brain changes on MRI than males with FXTAS (Adams et al., 2007; Hagerman & Hagerman, 2004). In a study of 68 adults with FXTAS (50 men, 18 women) 50% of men and no women had cognitive impairment (Seritan et al., 2008).

While the delineation of FXTAS as a medical disorder continues to evolve, the illness impact upon the patient as well as their caregiver regarding everyday physical and emotional needs has yet to be understood. A large body of literature exists on the caregiver response to dealing with chronic medical and psychiatric illness and neurodegenerative dementias, such as Alzheimer's disease (Cameron, Franche, Cheung, & Stewart, 2002; Cameron, Cheung, Streiner, Coyte, & Stewart, 2006; Grunfeld et al., 2004). Most caregivers are women, whether providing care for someone with dementia (72%) or someone with another condition (68%) (Ory, Hoffman, Yee, Tennsted, & Schulz, 1999). Informal (unpaid) female caregivers of community-dwelling patients with dementia had significantly higher odds of having a high score on the Zarit Burden Interview scale than male caregivers (Gallicchio, Siddiqi, Langenberg, & Baumgarten, 2002). Dementia caregivers spent significantly more hours per week providing care and reported greater impact in terms of employment complications, caregiver strain, mental and physical problems, time for leisure and other family members, and family conflict, when compared with non-dementia caregivers (Ory et al., 2006). Independent of dementia severity, caregivers felt more depressed, more burdened,

and spent more time giving care when their care recipients also had neuropsychiatric symptoms (Sink, Covinsky, Barnes, Newcomer, & Yaffe, 2006). Neuropsychiatric symptoms, including agitation/aggression, depression, apathy, disinhibition, and irritability, are salient features of FXTAS, compounding caregiver stress (Bacalman et al., 2006).

This study used Q-sort to assess physical and emotional needs of patients with FXTAS and their caregivers. The Q-sort technique, originally developed by Stephenson (Stephenson, 1953), has experienced a revival in the U.S.A. in the 1970s and in the U.K. since the 1990s. This approach has been adopted in a wide range of fields, including literary analysis, political science, communication theory, child psychology, nursing, pharmacy, and education (Barker, 2008; Block, 1994). In medicine, Q-sort methodology has been used in early intervention, with families of children with disabilities, as well as with health providers (Staley-Gane, Flynn, Neitzel, Cronister, & Hagerman, 1996; Prasad, 2001; Thompson et al., 2002). In the psychology realm, Q-sort instruments have gained considerable interest, being used in infant-mother attachment studies (Pederson et al., 1990; Vaughn & Waters, 1990), adapted to observing attachment behaviors of children with autism (Rutgers, van IJzendor, Bakermans-Kranenburg, & Swinkels, 2007), as measure of affect regulation (Westen, Muderrisoglu, Fowler, Shedler, & Koren, 1997), in rating behaviors of children with HIV (Moss et al., 1994) and their providers' reactions (Prasad, 2001), and extensively in personality disorders research (Westen, Shedler, & Bradley, 2006; Shedler & Westen, 2007). Recently, a measure of lifestyle-adjusted function based on the Q-sort has been developed for the elderly (Albert, Bear-Lehman, & Burkhardt, 2009).

Q-sort responses can help the treatment team to identify specific patient and caregiver needs and to appropriately tailor educational and psychosocial interventions. To our knowledge, this study is the first to evaluate the subjective needs and stressors of FXTAS families.

Methods

Participants

The Institutional Review Board at the University of California, Davis reviewed and approved the study protocol. Participants were 24 adult patients with FXTAS and 18 caregiver spouses who presented for evaluation as part a comprehensive research protocol. All patients and caregivers who saw the genetic counselor on the team were invited to participate; participation was voluntary. Patients traveled across the country in order to participate in this study and not all of them came accompanied by their caregivers. Also, some patients were only mildly affected therefore they did not need supervision. The only exclusion was a man with FXTAS who had a history of cerebrovascular accidents and subsequent severe cognitive impairment, whose reliability was questionable during the interview. Data was collected from January 2005 to June 2007 and included: age, gender, education level (for both patients and caregivers), and FXTAS stage, cognitive status, and psychiatric diagnoses (for patients). FXTAS stages are defined as follows: Stage 1 includes subtle or questionable tremor and/or balance problems, Stage 2 shows minor tremor and/or balance problems, with minimal interference in activities of daily living (ADLs), Stage 3 involves moderate tremor and/or balance problems with significant interference in ADLs, Stage 4 refers to severe tremor and/or balance problems with use of a cane or walker, Stage 5 means using a wheelchair daily, and patients in Stage 6 are bedridden (Bacalman et al., 2006). FXTAS staging was determined through clinical examination.

Patients' cognitive status was assessed based on clinical examinations and chart review, including neuropsychological testing. The clinical diagnosis of dementia, when applicable, was established by using the National Alzheimer's Coordinating Center (NACC) criteria: impairment in two or more cognitive domains, progression of deficits, and functional

decline (NACC, 2006). Potentially affected cognitive domains included attention, executive function, language, memory, personality, and visuo-spatial skills. Functional impairment had to be clearly established as due to cognitive, not motor, dysfunction (Seritan et al., 2008). Impairment in daily living activities or, in some cases, professional activities leading to early retirement, was most often due to the executive dysfunction that is a well described aspect of cognitive impairment in FXTAS (for example, inability to plan, perform a sequence of steps during an activity, or manage finances). Psychiatric diagnoses were based on clinical interview according to the Diagnostic and Statistical Manual, DSM-IV-TR (American Psychiatric Association, 2000) and were only available for 17 patients, due to the fact that the semi-structured psychiatric interview was introduced in the latter half of the research protocol.

Q-sort methodology

A copyrighted set of items previously developed by Flynn and Staley-Gane (Staley-Gane et al., 1996) formed the basis of this study. Q-sort items were compiled from an extensive review of the literature on needs of families of children with disabilities (Bailey, Blasco, & Simeonsson, 1992; Flynn & McCollum, 1993; Park et al., 2003). These items had been used in previous research with families of children with fragile X syndrome (FXS) (Staley-Gane et al., 1996) and were adapted to address priorities of families with FXTAS. The face validity of items was tested by having 7 individuals complete the Q-sort prior to administering it to the entire study sample.

The Q-sort for this study was composed of 17 items exploring the needs of patients with FXTAS and their caregivers. Items were designed to address three need domains: emotional (7 items), informational (4 items), and instrumental (6 items) (see Table 2). Eight of these items referred to formal assistance provided by professionals with training or expertise in the identified area. The other 9 items involved informal assistance, provided by individuals without special training or expertise (i.e., family, friends, or neighbors). A grid was composed, as shown in Figure 1. Items were printed on cards stating “It would make a difference in my life if I had”, and then listing a support item. Participants were instructed to rank the cards in the grid columns, according to their perceived importance, from “Most important to me” to “Least important to me”. Respondents were asked to review all the items and then choose the 6 most important items to them, which they assigned to columns 5–7, in relative order of importance. Participants were then asked to pick the 6 least important items, which they assigned to columns 1–3, according to a similar method. The 5 cards not selected were assigned to column 4. After ranking, participants identified which items were missing in their lives at the time of the Q-sort administration by turning those cards face down. Patients and their caregivers completed the Q-sort independently. At the end, participants were given the opportunity to name any additional items they would have liked to see included in the Q-sort.

Statistical analysis

Q-sort item scores were generated ranging from 1 to 7, anchoring the least important and the most important ends of the opinion continuum (see Figure 1). Statistical analyses used SAS Version 9.2 (SAS Institute, 2002–2003) and included descriptive statistics for all demographic and outcome variables (means and standard deviations for continuous variables and frequencies and percentages for categorical variables). Generalized estimating equations (GEE) (Liang & Zeger, 1986) were used to identify which of the need domains were perceived as most important by the participants. This approach allowed taking into account both the correlation between item scores of the same person, and between item scores of two spouses. A similar approach for binary data was used to analyze differences in items perceived as missing across the three need domains. Bonferroni adjustments for

multiple comparisons were used when testing differences across domains. All tests employed were two-tailed, with $\alpha = 0.05$.

Results

Twenty-four patients (19 men, 5 women) with FXTAS and 18 caregiver spouses (2 men, 16 women) completed the Q-sort. Only 21% of patients, but the majority of caregivers (89%), were women (Table 1). One of the female premutation carriers had questionable physical signs (FXTAS stage 1), while the other 4 were more affected (stages 2–4). None of the women with FXTAS were cognitively impaired. However 7 (37%) of the men had dementia, all of whom had more advanced illness (stages 3–5). Ten of the 17 patients who received a psychiatric evaluation (9 men, 1 woman) met diagnostic criteria for a disorder during their lifetime. Three men had anxiety disorders (2 with social phobia), 3 had depressive disorders (2 with major depression), and 3 men and the woman had both anxiety and depressive disorders. All patients were married, although only 18 caregivers were available to participate in the study. On average, patients were college-educated, some having obtained graduate degrees.

Table 2 summarizes the Q-sort item score means and standard deviations for the overall sample and stratified by patient and caregiver status. Both patients and caregivers ranked informational items (“Information about what to expect in the future” and “Information on how the person with FXTAS can be helped”) as most important (overall mean scores above 5.4). In descending order of scores, the top 3 informational items were followed by a cluster of emotional items (strong spiritual beliefs, knowing how the diagnosis would affect their family, support from family and friends, and professional counseling). All informational needs were described by formal items (involving expertise of trained personnel), whereas most emotional items (with the exception of professional counseling) were informal, in other words those needs could be met by untrained persons.

Understanding the impact of the disease on the family was a priority (overall mean score 4.6). A prominent additional source of support, having contact with other families affected by FXTAS, was especially important for caregivers (mean score 4.8). Respite care was moderately important to both patients and caregivers (overall mean score 3.7), showing that patients were aware of the burden their illness placed on their spouses. Participation in a formal support group was lower rated (overall mean score 3.5).

The last column of Table 2 presents the overall percentage of participants who identified the items as missing in their lives at the time of the Q-sort administration. Many important resources were lacking. For example, more than half of all patients and caregivers stated that they did not have enough information on what to expect in the future (57%) or on how the person with FXTAS could be helped (52%). Although participation in a support group was moderately important, 93% of participants were lacking this resource. One of the priorities was contact with other families affected by FXTAS however this was unavailable to 71% of participants. Ninety percent of participants noted the absence of home nursing services, whereas other instrumental needs were unmet in more than 60% of cases.

Treating the 17 item scores of each participant as repeated measures, a GEE model was fitted to investigate differences in perceived importance across the three need domains. After adjusting for multiple comparisons, three patterns of needs emerged. The most important needs were informational (estimated score 5.0), followed by those in the emotional domain (estimated score 4.2), while instrumental needs were least important (estimated score 3.1). All differences between domain pairs were statistically significant, with $p < 0.001$.

The next analyses investigated differences in needs between patients and caregivers by adding into the GEE model and testing a term for patient/caregiver status. Terms for gender, age, and education were also examined to investigate their effect on the need levels. Table 3 depicts the composite scores (calculated by averaging the scores for all the items within a domain) for the 3 need domains, overall and stratified by patient/caregiver status, gender, and patient FXTAS stage and cognitive status. Scores for all three domains were similar across the demographic and clinical characteristics and no statistically significant differences were detected. A similar GEE strategy was adopted to analyze the missing items, treating item status as a binary variable (1 = missing, 0 = present). After adjusting for multiple comparisons, the instrumental items were more likely to be identified as missing (estimate 69%, 95% *CI* 60% – 77%) than the emotional (estimate 44%, 95% *CI* 39% – 49%) and the informational items (estimate 38%, 95% *CI* 29% – 48%). Additional items that the participants would have liked to see in the Q-sort were: better communication between spouses and suggestions on helping their children and grandchildren.

Discussion

This study investigated the subjective needs of patients with FXTAS and their caregivers, allowing a glimpse into the varied psychosocial stressors they face. The Q-sort methodology presents advantages and disadvantages. In this forced-choice ranking method, each selection is affected by the other selections therefore individuals have to carefully prioritize their responses. The Q-sort is appropriate for small samples and it reveals dimensions of subjective phenomena from a perspective intrinsic to the individual to help determine what is statistically different about the dimensions (Valenta & Wigger, 1997). However, forced-choice measures may be less useful when evaluating traits across individuals, as opposed to Likert-type scales.

The participating patients were part of the first cohort of individuals with FXTAS seen at our institution. Mean age was 65 years and 37% of male patients in the sample had dementia. This is similar to the 42% rate of dementia found previously in males with FXTAS (Seritan et al., 2008). Also, the penetrance of marked cognitive impairment in male carriers of premutation alleles with over 70 CGG repeats was six times higher than in controls (33.3% vs. 5.1%) in a recent study (Sévin et al., 2009). Similar to prior findings (Seritan et al., 2008), no women with FXTAS had dementia in our study. FXTAS cognitive deficits, including attention problems, executive dysfunction, disinhibition, and impulsivity can alter decision making capacity, and thus influence Q-sort responses. However response reliability was questionable in only one patient, who was excluded. Even though 7 men had dementia, they completed the Q-sort without apparent difficulty.

Patients with FXTAS have to cope with multiple stressors, including loss of physical stamina and cognitive ability, loss of independence, and at times relationship strain. Many of these patients are high-achieving, high-functioning individuals for whom these losses are even more difficult. They may harbor guilt about carrying the premutation gene, which has been passed on to their offspring. Both men and women with FXTAS have a high lifetime prevalence of mood and anxiety disorders (Bourgeois et al., in press; Roberts et al., 2009; Rodriguez-Revenga et al., 2008). In our study, 10 (59%) of the 17 patients who completed a psychiatric interview met criteria for anxiety and/or depressive disorders, and the number of cases would likely be higher, if all patients and caregivers had been assessed by the team psychiatrists. Even when not formally evaluated, many patients reported symptoms of anxiety and depression. The limited availability of psychiatric assessments did not allow a detailed analysis of the relationship of Q-sort responses to psychiatric co-morbidities.

Most caregivers of patients with FXTAS are female spouses, due to the fact that men develop FXTAS more often and may be more severely affected than women. In this study, almost 90% of caregivers were the patients' wives, and lack of support was their main identified difficulty. Our sample was small. Furthermore, not all patients participated with their caregivers. Research on larger samples and using validated scales, such as the Zarit Burden Interview (Zarit, Reever, & Bach-Peterson, 1980) or the Screen for Caregiver Burden (Vitaliano, Russo, Young, Becker, & Maiuro, 1991) will allow closer exploration of the caregiver burden. Additionally, screening for depressive and anxiety symptoms in this high-risk group is recommended.

Overall, informational needs were ranked as most important, followed by emotional, and, lastly, by instrumental needs. This could be due to the fact that our study participants were highly educated and viewed information about their illness as a priority, with emotional reaction being secondary. Focusing on obtaining objective information instead of feelings (intellectualization) is a defense mechanism often used by individuals with obsessive-compulsive symptoms, which have been reported in premutation carriers (Hessl et al., 2005). Instrumental resources were more likely to be identified as missing, so it is not clear if those needs were not pursued because they were less important at the time. However since instrumental resources may depend on insurance coverage or private funding we hypothesize that they were likely missing due to cost constraints.

One of the difficulties in meeting the patients' and caregivers' informational needs is the still evolving picture of the FXTAS illness course, neuropsychiatric and clinical phenotype, and treatments. There are also geographic barriers, as many patients travel thousands of miles in order to participate in research studies, and they desire to find local providers familiar with FXTAS. As noted especially by caregivers, contact with other families affected by FXTAS was very important but not readily available. Providers should be aware of this need. The National Fragile X Foundation (www.fragilex.org) provides information about FXTAS and an online support network.

Multigenerational families present additional challenges. Multiple family members may be affected by the full *FMRI* mutation or premutation, compounding the burden of unaffected family caregivers. In families where the father has FXTAS, all of the daughters are carriers of the premutation and they are at an approximately 50% risk of having a child affected by FXS. The adult daughter ("sandwich generation") cares for her children, of whom one or more may have FXS, and may in addition help care for the elderly father with FXTAS. In these cases, it is hard to differentiate the impact of caring for children with FXS, versus parents with FXTAS, versus anxiety and depressive symptoms associated with the premutation per se (Roberts et al., 2009; Rodriguez-Revenge et al., 2008). In one of the families in this study, a 60 year-old man with FXTAS and his wife served as main caregivers for their four grandchildren, all affected by the premutation to different degrees. In caregivers with significant depression or anxiety, selective serotonin reuptake inhibitors (SSRIs) may be helpful. Also, SSRIs or serotonin-norepinephrine reuptake inhibitors (venlafaxine or duloxetine) are typically helpful for depressive and/or anxiety symptoms in patients with FXTAS (Hagerman et al., 2008). Psychoeducation, support for the patient and family members, particularly the caregiver, and delivering psychiatric care in a multidisciplinary team context, with consistent longitudinal follow-up, are additional critical management strategies (Hagerman et al., 2008).

Conclusion

FXTAS is a newly described neurodegenerative disease in *FMRI* premutation carriers. Despite a growing body of knowledge placing FXTAS among known movement disorders

with dementias, many aspects are yet unknown. Patients and their caregivers face severe psychosocial stressors. Patients may encounter physical disability, cognitive and psychiatric symptoms, and uncertainty about the future. Significant caregiver burden may ensue, especially given the multigenerational context of this genetic disease. Providers should be educated and able to provide timely information and referrals to formal services, as well as to informal resources, including the National Fragile X Foundation online support network.

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Figure 1.
Q-sort distribution.

Table 1

Characteristics of study participants.

	Patients (n = 24)	Caregivers (n = 18)
Age (years)^a	65.6 ± 6.4	63.6 ± 6.2
Education (years)^a	16.2 ± 3.2	14.8 ± 2.6
Gender		
Female	5 (21%)	16 (89%)
Male	19 (79%)	2 (11%)
Cognitive Status		
Dementia	7 (29%)	
No dementia	17 (71%)	
FXTAS Stage		
1	1(4%)	
2	8 (33%)	
3	7 (29%)	
4	6 (25%)	
5	2 (8%)	

^a data missing for 2 caregivers

Table 2

Q-sort item scores (means and standard deviations) and frequency of items identified as missing.

	Overall (n = 42)	Patient (n = 24)	Caregiver (n = 18)	Percent Missing^a
I ₁ . Information about what to expect in the future	5.9 (0.9)	5.9 (1.0)	5.9 (0.6)	57%
I ₂ . Information on how the person with FXTAS can be helped	5.4 (1.4)	5.0 (1.4)	5.9 (1.3)	52%
I ₃ . Information about FXTAS	4.7 (1.0)	5.0 (1.1)	4.3 (0.8)	14%
E ₁ . Strong spiritual beliefs or involvement with an organized religion	4.7 (2.0)	4.7 (2.1)	4.6 (1.9)	17%
E ₂ . Knowing how the diagnosis would influence my family	4.6 (1.3)	5.0 (1.0)	4.0 (1.4)	36%
E ₃ . Contact with other people who have experienced the same situation	4.3 (1.2)	3.9 (1.2)	4.8 (1.0)	71%
E ₄ . Family or close friend to talk to about my concerns	4.2 (0.9)	4.3 (0.9)	4.1 (0.9)	14%
I ₄ . Information about FXTAS to share with others	4.2 (1.2)	4.3 (1.2)	4.1 (1.2)	29%
E ₅ . Counseling with a professional person	4.2 (1.2)	4.1 (1.2)	4.2 (1.1)	52%
E ₆ . Relaxing and fun activities	3.9 (1.3)	4.2 (1.3)	3.6 (1.4)	24%
It ₁ . Respite care or other help for the person with FXTAS	3.7 (1.1)	3.5 (1.1)	3.9 (0.9)	64%
E ₇ . Participation in a support group	3.5 (1.1)	3.4 (1.2)	3.6 (0.9)	93%
It ₂ . Financial help with expenses	3.4 (1.5)	3.2 (1.4)	3.7 (1.6)	69%
It ₃ . Special equipment to meet physical needs	3.2 (1.4)	3.2 (1.4)	3.4 (1.5)	60%
It ₄ . Help with living independently	3.2 (1.3)	3.0 (1.2)	3.0 (1.2)	69%
It ₅ . Nursing services in the home	2.6 (1.2)	2.7 (1.2)	2.6 (1.2)	90%
It ₆ . Help with transportation	2.5 (1.2)	2.6 (1.2)	2.3 (1.1)	62%

E = emotional need item; I = informational need item; It = instrumental need item

^aPercentage of participants who reported these items as missing from their lives

Table 3

Q-sort item domain scores (means and standard deviations).

	Status			Gender		FXTAS Stage			Cognitive Status	
	Overall (n = 42)	Patient (n = 24)	Caregiver (n = 18)	Female (n = 21)	Male (n = 21)	1-2 (n = 9)	3-5 (n = 15)	Dementia (n = 7)	No dementia (n = 17)	
I	5.0 (0.6)	5.0 (0.6)	5.0 (0.6)	5.0 (0.6)	5.0 (0.7)	5.3 (0.6)	4.9 (0.6)	4.9 (0.8)	5.1 (0.6)	
E	4.2 (0.6)	4.2 (0.6)	4.1 (0.5)	4.2 (0.5)	4.1 (0.6)	4.3 (0.7)	4.2 (0.6)	4.2 (0.7)	4.2 (0.6)	
It	3.1 (0.7)	3.0 (0.6)	3.2 (0.9)	3.0 (0.8)	3.2 (0.6)	2.8 (0.5)	3.2 (0.6)	3.2 (0.6)	3.0 (0.6)	

I = informational need domain; E = emotional need domain; It = instrumental need domain

Domain scores were calculated by averaging all the item scores within a domain