

1-1-2011

## **Measuring older patients' attitudes to general practice registrars: Exploratory factor analysis of a survey instrument**

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### **Citation**

Bonney, Andrew D.; Magee, Christopher A.; and Caputi, Peter, 2011, Measuring older patients' attitudes to general practice registrars: Exploratory factor analysis of a survey instrument, 74-85.  
<https://ro.uow.edu.au/medpapers/65>

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### Abstract

**Introduction:** Training general practice registrars (GPRs) to meet the challenges of an ageing population is hampered by their relatively reduced contact with older patients and a paucity of suitable research to inform training models. This paper describes an exploratory factor analysis of a survey instrument assessing the attitudes of older patients to GPRs, as part of a project to address these concerns.

**Methods:** The instrument was developed on the basis of a qualitative study and a literature review and distributed to 500 patients aged 60 years and over from 10 training practices in regional Australia.

Responses to 22 of the survey's Likert scale items were examined, including inter-item correlations and internal consistency (Cronbach's alpha). Exploratory factor analysis was performed to identify domains of patients' attitudes. **Results:** The response rate was 39.2% (n=196). None of the items were redundant and the scale had appropriate levels of internal consistency (Cronbach's alpha = 0.76). The exploratory factor analysis identified three factors. Factor one, labelled 'interpersonal trust', explained 26.2% of the variance.

Factor two accounted for 11.4% of the variance and was labelled 'system trust'. Factor three, labelled 'interpersonal continuity', explained 7.5% of the variance. **Conclusion:** The instrument demonstrated acceptable psychometric properties and three distinct factors reflecting older patients' attitudes toward GPRs, with trust appearing to be particularly important. The instrument appears effective in obtaining valid data, which should assist in developing improved training models. These findings warrant confirmation with a larger sample and exploration of adaptations of the instrument to be used in other contexts. **Keywords:** general practice registrar; post-graduate training; patient attitudes

### Keywords

older, measuring, patients, attitudes, general, practice, registrars, exploratory, factor, analysis, survey, instrument

### Disciplines

Medicine and Health Sciences

### Publication Details

Bonney, AD, Magee, CA & Caputi, P, Measuring older patients' attitudes to general practice registrars: Exploratory factor analysis of a survey instrument, *Focus on Health Professional Education: A Multidisciplinary Journal*, 12(3), 2011, 74-85.

# Measuring older patients' attitudes to general practice registrars: Exploratory factor analysis of a survey instrument

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## Introduction

Vocational training for general practice follows an apprenticeship-like model: trainees, referred to as general practice registrars (GPRs), gain experience by working in community based practices under the supervision of practising general practitioners (GPs) (Sturmberg & Heard 2004). With the ageing of the Australian population, these GPs of the future will be managing an increasing caseload of older patients (Britt et al. 2008), with the concomitant responsibility for chronic and complex care management that older patients bring. Currently, over 40% of all Australian GP consultations address a chronic problem, with this figure having steadily risen in recent years (Britt et al. 2009; Britt et al. 2008). Therefore, adequate training for the management of the elderly and chronically ill is assuming increasing importance (Spike & Britt 2006). While it has been recognised in many countries that there is a need for significant structural reform for general practice to adapt to these and other changes (CFPC 2009; Harris & Zwar 2007; NHHRC 2009; Rosenthal 2008; Soubhi 2007), it is also evident that models of GP training and registrar learning requirements will need to adapt (Lipman 2000).

Adult education theory indicates that adults are motivated to learn by the need to solve important, real-life problems (Knowles et al. 1998). It is concerning then that GPRs are involved in the management of significantly fewer older and chronically ill patients than established GPs, as this has clear consequences in reducing learning opportunities (Spike & Britt 2006). In addition, Australian qualitative research

has indicated that older patients have different expectations of their patient-doctor relationship with GPRs, as compared with their usual GPs, resulting in a tendency to more superficial, convenience based consultations with GPRs (Bonney et al. 2009a). Therefore providing experience for GPRs in the management of older patients is hampered by both reduced opportunities and the dynamics of the interaction. To address these concerns, barriers to older patient-GPR interaction need to be identified so that training models can be developed that are acceptable to patients and that enable adequate experience for GPRs.

Unfortunately, there has only been limited research investigating how patients respond to GPRs (Bonney et al. 2009b). For example, a review of the literature identified that from 1980 to March 2009, only 15 papers had been published that examined patients' attitudes to GPRs (Bonney et al. 2009b). From the limited data available from two of these studies, there is evidence that increasing age is associated with less positive attitudes toward GPRs (Murphy 1995), and patients are less willing to have chronic conditions managed by GPRs (Allen & Bahrami 1981; Murphy 1995). However, no previous quantitative studies have focused on older patients. In addition, previous studies have been limited by inconsistencies in the measures used to assess patients' attitudes or satisfaction with GPRs. Neither of the two studies which touched on patients' attitudes to GPR chronic disease involvement used validated instruments. Of other work regarding attitudes to GPRs, four studies utilised some pre-existing and validated

questionnaires, but these assessed a range of constructs including patient trust (Bonds et al. 2004), patient satisfaction (Rodney et al. 1986; Yancy et al. 2001) and social support (Boutin-Foster & Charlson 2001). One study validated a pre-existing patient satisfaction questionnaire in the context of family practice training centres (Rodney et al. 1986), while another validated their own survey instrument, which had been developed for a very specific population (i.e. patient satisfaction in gynaecologic care provided by residents at a university medical centre) (Sheets et al. 1991).

Utilising existing generic patient satisfaction questionnaires in this context is problematic, as previous studies have indicated that there is an overall reported acceptable satisfaction with GPR consultations, with a co-existing reluctance of patients, especially older ones, to having GPRs manage their complex/chronic problems (Bonney et al. 2009b). Hence it is unlikely that existing patient satisfaction questionnaires can accurately assess the factors involved in older patients' decisions regarding consulting a GPR, as they have not been designed or validated for use in that context. Therefore, there is a need for a validated instrument that assesses patients' attitudes to GPRs and that is suitable for use in older patient populations.

As part of a project to address these concerns, one of the authors undertook a multi-centre cross-sectional survey of older patients' attitudes to GPRs; reported elsewhere (Bonney et al. 2010). The purpose of this paper is to report on an examination of some of the psychometric properties of the survey instrument and assess its potential

effectiveness in obtaining valid data to assist GP training adapt to its changing environment.

## **Methods**

### *Materials*

The survey instrument was developed on the basis of a literature review (Bonney et al. 2009b) and a qualitative study (Bonney et al. 2009a). The instrument included 11 categorical, four open response, and 30, 5-point Likert scale attitude items (1 = most negative; 5 = most positive). Only 22 of the latter were considered in this study. These items were designed to explore patients' attitudes to GPRs in the context of their relationship with their usual GP, and were linked to themes identified in previous research (Bonney et al. 2009b): seven regarding continuity of care (items 11, 13, 19, 21, 25, 26 and 31); two regarding each of access (items 10 and 12) and openness (items 22 and 23); six regarding trust (items 14, 15, 17, 18, 24 and 27) and four regarding communication (items 16, 20, 28 and 29). None of the items were reverse scored. Previous research had also identified that patients were unfamiliar with the term 'registrar' (Bonney et al. 2009a). Therefore the term 'new doctor' was used in the survey instrument, with an explanatory note for respondents. This term had been used successfully in a previous study of patients' attitudes to GPRs (Murphy 1995).

### *Procedure*

Approval from the Human Research Ethics Committee of the University of Wollongong (New South Wales) was obtained before initiation of the

study. A two-stage sampling process was employed in order to obtain a sample with approximately equal rural and non-rural participants. The public website of a general practice training provider in regional Australia was accessed. The 87 listed training practices were stratified according to their designation as belonging to a 'rural' (n=41) or 'general' (n=46) training stream, and the chief investigator telephoned the principal of each practice to discuss the research, invite their participation and forward information and consent forms. Practices were then randomly selected within each stream and invited to participate. This process continued until five practices from each group consented to involvement, indicated by returning a signed consent form. To assist patients' recall of GPRs, practices were excluded if they had not had a registrar within the previous 3 months.

Participating practice personnel were instructed to offer to 50 sequential patients aged 60 years and over - post-consultation - an information sheet and the questionnaire with a return postage paid envelope. The respondents returned completed questionnaires by mail directly to the university. No incentives were offered to individual respondents; however each participating practice received a \$100 gift voucher in appreciation of the time spent in their involvement.

### ***Statistical analyses***

Data were checked for missing values or data entry errors. Respondents with missing data were excluded from the study to minimise problems with the identification of factors. The 22 items assessing respondents' attitudes to GPRs that were included in the study are

listed in Table 1. We did not include other items in the questionnaire as these addressed different issues (e.g. respondents' choices in a hypothetical chronic disease management scenario) that were not relevant to the scope of this paper. Similarly, two items that addressed previous experiences with GPRs (satisfaction with GPR visits and ease of communication with GPRs) were excluded as they were not germane to this paper and were only relevant for respondents who had seen a GPR.

In the next stage of the analysis, the psychometric properties of the selected items in the questionnaire were examined. This involved calculating the inter-item correlations, item total correlations and internal consistency (i.e. Cronbach's alpha). Any items that had low item total correlations, inter-item correlations, and/or substantially lowered the internal consistency were inspected further and if appropriate were excluded. Velicer's minimum average partial (MAP) test was used to determine the optimal number of factors to extract, as it is considered more accurate than traditional rule-of-thumb approaches such as using Eigen values (O'Connor 2000). On theoretical grounds it was expected that the factors might be related; therefore factor analysis was performed using principal component analysis with direct oblimin rotation to identify the factor structure and loadings.

### **Results**

#### ***Descriptive statistics of the sample***

Of 500 surveys distributed, a total of 233 questionnaires were received. Inspection of the data indicated that 37 questionnaires (15.9%) had missing values in at least one of the Likert scale

**Table 1:** Items included in the factor analysis

Item No.	Item
10	I am happy to see a new doctor for a minor medical complaint, or simple request like a repeat prescription
11	It is important to me to have a regular doctor who knows me and knows my medical history well
12	Most of the time it is more important for me to see any doctor who is available rather than waiting to see the doctor of my choice
13	I prefer to see my regular doctor for the management of all my medical conditions
14	In seeing a new doctor, it would take time to build trust
15	I am uncertain how well a new doctor would be able to help me with my problems
16	I would not feel comfortable talking with one of the new doctors about a sensitive problem
17	If I see a new doctor, I worry that they might not take my concerns seriously
18	I would not find seeing a new doctor reassuring
19	If I saw a new doctor for a medical problem, I would like to know that my ongoing contact with my regular doctor was not broken
20	It would be good to have information available regarding the experience and qualifications of the new doctors
21	It would be good to have information regarding what period of time a new doctor will be working at my surgery (e.g. 6 months, 12 months, indefinitely)
22	I think my regular doctor is happy for me to see the new doctors for any of my medical problems
23	Supporting the new doctors who come to my medical practice might encourage more doctors to stay in the area
24	I expect that all of the doctors at the surgery I attend have good medical knowledge and skills
25	The relationship I have with my usual doctor is something I would value continuing into the future
26	A new doctor would not have the full picture of my medical history and background
27	I am only willing to see a new doctor if I knew the doctor worked closely with my regular doctor
28	I don't like having to go through my medical history all over again with a new doctor
29	Knowing that my medical record is readily available helps me feel confident in seeing different doctors in the practice
31	If my usual doctor transferred my care to one the new doctors, I'd feel a bit abandoned
32	It takes time to develop a good relationship with a new doctor

attitude items in the questionnaire. These questionnaires were excluded from the analyses, leaving a final sample size of 196 (response rate of 39.2%). The average age of the sample was 71.7 years (range 60-92 years); other demographic characteristics of the study sample are shown in Table 2 and indicate that 120 (61.2%) of the sample were female. Rural respondents comprised 52% of this sample (n=102) and non-rural

respondents 48% (n=94). Over half of the respondents stated they had seen a GPR previously (n=120, 61.5%). The majority of respondents (n=139, 70.9%) reported having at least one chronic or complex medical problem.

***Psychometric properties of the questionnaire***

Most inter-item correlation coefficients were between 0.20 and 0.50, with none

**Table 2:** Characteristics of the study sample

Characteristic	n	%
<b>Gender</b>		
Male	76	38.8
Female	120	61.2
<b>Age</b>		
60–64 years	30	15.5
65–69 years	55	28.4
70–74 years	45	23.2
75–79 years	30	15.5
80 years and over	34	17.5
<b>Country of Birth</b>		
Australia	140	78.6
Other	56	21.4
<b>Employment status</b>		
Currently employed	27	13.8
Not employed	169	86.2
<b>Length of time at practice</b>		
<1 year	10	5.1
1–4 years	40	20.4
5–10 years	47	24.0
>10 years	98	50.0
<b>Length of time with doctor</b>		
<1 year or no regular doctor	15	7.8
1–4 years	47	24.0
5–10 years	58	29.6
>10 years	72	36.7

exceeding 0.71; this suggests that none of the items overlapped considerably. Most of the item total correlations were also moderate and ranged from 0.20 to 0.57. The Cronbach's alpha for the scale was 0.76, which reflects an adequate level of internal consistency (Bland & Altman 1997; Schmitt 1996). On the basis of these results, all of the 22 items were included in the subsequent factor analysis.

Velicer's MAP test identified a three-factor model as the optimal factor structure. As a result, factor analysis was performed to extract three factors, which are shown in Table 3.

**Table 3:** Factor structure and loadings

Item No.	Factor		
	1	2	3
17	.815		
18	.775		
15	.745		
16	.725		
26	.632		
20	.545		
28	.544		
14	.535		
27	.498		
21	.490		
23		.671	
12		.665	.320
22		.661	
29		.656	
24		.552	
10		.513	
25			-.808
13			-.540
19			-.534
11			-.505
31			-.407
32	.345		-.387
Variance explained (%)	26.25%	11.44%	7.54%

Bold values indicate that the component has adequate factor loadings on the respective factor

Factor 1 accounted for 26.2% of the variance. It comprised the following items (in order of decreasing factor loading): 17, 18, 15, 16, 26, 20, 28, 14, 27 and 21. These items related to: the respondent's concerns about not being taken seriously by a new doctor; not finding seeing a new doctor reassuring; being uncertain as to whether

a new doctor would be able to help their problems; feeling uncomfortable discussing sensitive issues with a new doctor; feeling a new doctor would not have their full history; wanting to know the qualifications of a new doctor; not wanting to see a new doctor as they had to go through their history again; feeling it would take time to build trust with a new doctor; only wanting to see a new doctor if they worked closely with their usual doctor; and wanting information on the length of time a new doctor was staying in the practice. As a result this factor was labelled 'interpersonal trust' (Hall et al. 2002). The factors loadings for all items were acceptable (0.815-0.490) and the factor had a satisfactory level of internal consistency (Cronbach's alpha = 0.850).

The second factor accounted for 11.4% of the variance and consisted of items 23, 12, 22, 29, 24 and 10. These items assessed: if respondents felt that in seeing a registrar the doctor might be encouraged to stay in the area; whether respondents agreed it was more important for them to see any available doctor; whether respondents thought their regular doctor was happy for them to see a registrar for any medical problem; whether they felt reassured in seeing different doctors by the medical record being readily available; if they expected good skills in all doctors at their surgery; and whether they were happy to see any doctor for a simple complaint. As a result, this factor was labelled 'system trust' (Bonds et al. 2004; Hall et al. 2002). The factor loadings were all adequate (0.671-0.513), and the factor also had an acceptable level of internal consistency (Cronbach's alpha = 0.710).

The third factor included accounted for 7.5% of the variance and included items 25, 13, 19, 11, 31 and 32. These items addressed issues relating to: whether respondents whether their relationship with their usual GP was something they valued continuing into the future; whether they only wished to see their regular doctor for all medical problems; if in seeing a new doctor they did not wish their contact with their usual GP to be broken; whether a respondent felt it was important to have a regular doctor who knew them and their history well; whether they would feel abandoned if their care was transferred to a new doctor; and if they felt it would take time to develop a good relationship with a new doctor. As a result this factor was labelled 'interpersonal continuity' (Saultz 2003). The internal reliability of this factor was lower than the other factors, but was still adequate (Cronbach's alpha = 0.656). Most factor loadings were also adequate (-0.808 to -0.407), with the exception of item 22 (-0.387) which also cross-loaded on factor 1.

## Discussion

The present study involved a preliminary investigation of the psychometric properties of a new survey instrument to assess older patients' attitudes to GPRs. This provided a number of useful outcomes in the context of the study sample. First, the instrument had acceptable psychometric properties with adequate levels of internal reliability (Schmitt 1996) and no indication of redundant items. Second, three distinct factors were identified which were labelled 'interpersonal trust', 'system trust' and 'interpersonal continuity'. These factors were consistent with

previous theory and research concerning significant features of the patient-doctor relationship (Bonds et al. 2004; Hall et al. 2002; Mechanic 1998; Saultz 2003). However, the solution differed from the authors' *a priori* coding of the items to themes arising from research specific to registrar consultations (Bonney et al. 2009a), as outlined in the Materials section. Possible reasons for these changes are discussed below. Table 4 summarises the item groupings before and after the factor analysis.

### ***Interpersonal trust***

While there are numerous definitions of trust, the authors have found the definition used by Hall et al to be useful: '*...trust is the optimistic acceptance of a vulnerable situation in which the truster believes the trustee will care for the truster's interests*' (Hall et al. 2001). Trust in the context of medical care has been said to contain interpersonal (patient-doctor) and system (patient-institution) components (Bonds et al. 2004; Hall et al. 2002) as well as affective and anticipatory dimensions (Bonds et al. 2004). The factor labelled 'interpersonal trust' is constituted of items of an anticipatory nature, relating to concerns regarding the personal interaction in (14, 16-18, 21 and 28), or medical efficacy of (15, 20, 26 and 27), a future registrar consultation. This factor consists of the majority of components of the hypothesised 'trust' and 'communication' themes, and two items from the 'continuity' theme (21 and 26). Communication (Mechanic 1998) and continuity of care (Mainous et al. 2001) have both been previously noted to have associations with patient interpersonal trust, which provides a

plausible explanation for these items extraction to this factor.

### ***System trust***

The factor labelled 'system trust' contains all of the items of the hypothesised 'access' (10 and 12) and 'openness' (22 and 23) themes, one 'communication' (29) and one 'trust' item (24). It seems likely that when patients express 'openness' to consulting an unknown doctor in training, they are displaying features of 'system trust': a trust in the clinic they attend, or the medical system as a whole (Bonds et al. 2004; Bonney et al. 2009a). System trust was epitomised by the item, 'I expect all the doctors in the practice I attend have good medical skills' (24), considered under the theme of trust before the analysis. Patient preference for access over continuity of care (10 and 12) also implies system trust, rather than a requirement for interpersonal trust with a specific doctor. It is likely that the 'communication' item that was extracted - 'ready availability of the medical record' (29) - also refers to a condition that contributes to patients' trust of their medical care at a system level.

### ***Interpersonal continuity***

The final factor, 'interpersonal continuity', consists of the majority of the items from the 'continuity' theme (11, 13, 19, 25 and 31). All of these items referred to 'interpersonal continuity, i.e. an ongoing personal relationship with the one GP, as opposed to 'informational' or 'longitudinal' continuity (Saultz 2003). The item initially under the communication theme, 'It takes time to develop a good relationship with a new doctor' (22),

**Table 4:** Comparison of hypothesised themes and extracted factors

Hypothesised themes						
Item No	Continuity	Access	Openness	Trust	Communication	After factor analysis
17						
18						
15						
16						
26						
20						
28						
14						
27						
21						
23						
12						
22						
29						
24						
10						
25						
13						
19						
11						
31						
32						

Interpersonal trust

System trust

Interpersonal continuity

cross-loaded on factor 1. This is not surprising as the item is also likely to encompass aspects of interpersonal trust; however we felt it was more appropriate for it to be included in the interpersonal continuity factor.

**Conclusion**

The development of a valid tool to assess older patients' attitudes to GPRs

is timely. The instrument investigated has a number of advantages over previously used instruments. It has been designed for use by older patients within the specific setting of community based general practice. Furthermore, it explores patients' attitudes in the anticipation of seeing a registrar in the context of their relationship with their regular doctor. The results from the

use of this instrument may therefore inform the development of appropriately directed strategies to assist older patients acceptance of registrars, and avoids the previously noted problems associated with generic satisfaction instruments. This exploratory analysis suggests that the survey instrument has acceptable psychometric properties, including construct validity. The use of MAP to determine the optimal number of factors provided a solution with appealing face validity, lending support for the wider utilisation of this method.

The factor analysis suggests that the items used to investigate the five themes arising from the previous qualitative study refer to three underlying constructs: interpersonal trust, system trust and interpersonal continuity. The factors relating to trust (especially interpersonal trust) appeared to be the most important accounting for most of the variance, but interpersonal continuity might still be important. These findings are tentative, given the modest sample size, and verification with a larger sample in differing settings is required. In addition, generally accepted operationalisations of patient trust (Hall et al. 2002) and continuity of care (Saultz 2003) are still awaited, and hence it is not possible to draw firm conclusions on the appropriateness of the categorisations of the factors. However, the instrument shows strong promise in being effective in providing valid data to assist adaptive change in GP training, and awaits confirmatory analysis after being applied to a larger sample. There is definite scope for investigating the use of derivations of this instrument to explore patients' responses to others undertaking

training in community based healthcare settings, including medical students and trainees in other disciplines. The instruments focus on trust and interpersonal continuity raise the possibility of investigating adapting the instrument to assess patients' attitudes to multidisciplinary team care in the community as well.

### Acknowledgements

The authors would like to thank the participating practices and patients; the research team at the Centre for Health Initiatives, University of Wollongong, for administrative assistance; Ms Lyn Phillipson and Prof Sandra C Jones for their involvement in the initial survey development; and Prof Don Iverson for his assistance with the initial survey development, suggesting the project and helpful advice on the manuscript.

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