A cross-sectional study investigating the relationships between self-management abilities, productive patient-professional interactions, and well-being of community-dwelling frail older people

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ABSTRACT

Worldwide, the maintenance of well-being in ageing populations with associated frailty has become increasingly important. To maintain well-being during ageing, investment in frail older people's self-management abilities and the fostering of productive interactions with healthcare professionals may lead to higher levels of well-being. The aim of this study was to investigate the relationships between community-dwelling frail older people's self-management abilities, productive patient-professional interactions and well-being, while controlling for socio-demographic characteristics. The cross-sectional study included 588 community-dwelling frail older people (aged ≥ 75 years) from 15 general practitioner (GP) practices in the Netherlands. Well-being (Social Production Function Instrument for the Level of well-being short), productivity of interactions with GPs (relational coproduction instrument), and self-management abilities (Self-Management Ability Scale short) were measured during in-home face-to-face interviews by trained interviewers. Data were analysed using descriptive statistics, correlation analyses, and linear mixed-effects models. Significant relationships were detected between self-management abilities and the overall, social, and physical well-being of older people, and between productive interactions with GPs and overall and social well-being, but not physical well-being. In a time of ageing populations with associated frailty, investment in frail older people's self-management abilities and the productivity of patient-professional interactions may be beneficial for this population's well-being.

INTRODUCTION

Worldwide, the maintenance of ageing populations' well-being has become increasingly important (Steptoe, Deaton, & Stone, 2015). Frailty, defined as the presence of problems or losses in multiple domains (physical, psychological, and social) of human functioning (Gobbens, Luijkx, Wijnen-Sponselee, & Schols, 2010a), is associated with lower levels of well-being among community-dwelling older people (Andrew, Fisk, & Rockwood, 2012). Compared with the general population, frail older people have a compromised ability to realise and maintain well-being (Nieboer & Cramm, 2018). This is due to changes and declines in available physical and social resources, and in opportunities to realise well-being (Steverink, 2014). Consequently, maintaining the well-being of a frail population is a key challenge (Steptoe et al., 2015). To maintain well-being levels during ageing, investment in frail older people's self-management abilities and the fostering of productive interactions with healthcare professionals may lead to higher levels of well-being.

Individuals are motivated to improve their living situations to optimize their levels of well-being, although this endeavor is not always successful (Nieboer & Cramm, 2018; Steverink, 2014). The balance between resource gains and losses changes over the life span, with losses gradually dominating (Steverink, Lindenberg, & Ormel, 1998). Consequently, as people grow older, the maintenance of need fulfilment and management of losses therein become increasingly important (Steverink, Lindenberg, & Slaets, 2005; Steverink, 2014). The realisation and maintenance of well-being depend on the possession of adequate resources that aid the fulfilment of needs contributing to well-being, and, more importantly, the ability to manage these resources (Steverink, 2014). Self-management abilities consist of a diverse repertoire of cognitive and behavioural abilities to manage resources for fulfilling well-being needs and managing losses (Steverink et al., 2005; Steverink, 2014). Older people with better overall self-management abilities are expected to be more effective in creating, maintaining, and restoring their well-being (Steverink et al., 2005; Steverink, 2014).

In addition, healthcare professionals can support a person's development and maintenance of abilities that enable well-being in older age. Researchers and practitioners increasingly recognise the need for person-centered approaches that are responsive to frail older people's preferences and needs (beyond physical health and clinical outcomes) and are successively aimed at protecting their well-being (Cramm & Nieboer, 2015b; WHO, 2015). Productive interactions between frail older people and their healthcare professionals (Gittell & Douglass, 2012; Gittell, 2006; Gittell, 2002; Wagner et al., 2001) are assumed to be essential in enhancing care processes and optimising (abilities to maintain) well-being (Barr et al., 2003; Nolte & McKee, 2008; Wagner et al., 2001; Wagner et al., 2005; WHO, 2015). The quality of interactions is assumed to affect a person's well-being. The recognition of a person's needs may improve patient-professional

interactions by encouraging trust and affection (Kuipers, Cramm, & Nieboer, 2019), and may provide insight into unfulfilled needs and the associated changes required to protect a frail older person's well-being (Steverink & Lindenberg, 2006).

Previous research has shown that greater self-management abilities are associated with greater well-being among older people (Cramm et al., 2012; Cramm et al., 2013; Goedendorp & Steverink, 2017; Steverink & Lindenberg, 2008). Also, research has shown that the productivity of interactions is associated with the improved well-being of chronically ill patients (Cramm & Nieboer, 2015c; Kuipers et al., 2019). To our best knowledge, the relationship between productive patient-professional interaction and well-being has not been investigated in a population of independently living frail older people (75 years and older) in a primary care setting in the Netherlands. The primary care setting is considered to be among the most important settings for the delivery of care and support to community-dwelling frail older people (Cesari et al., 2016), with gatekeeping general practitioners (GPs) as central actors in Dutch primary care (Kroneman et al., 2016; van Campen, Broese van Groenou, Deeg, & Iedema, 2013). The aim of this study was to investigate the relationships between community-dwelling frail older people's self-management abilities, productive patient-professional interactions and well-being, while controlling for socio-demographic characteristics.

Theories of well-being, self-management, and productive interactions

Well-being of frail older people

Social production function (SPF) theory holds that individuals are active producers of their own subjective or psychological well-being via attempts to obtain universal needs of physical and social well-being (Lindenberg & Frey, 1993; Lindenberg, 1996; Nieboer & Cramm, 2018; Ormel, Lindenberg, Steverink, & Verbrugge, 1999; Ormel, Lindenberg, Steverink, & Von Korff, 1997). Overall well-being is considered to be the joint production of physical and social well-being (Ormel et al., 1999; Ormel et al., 1997). The SPF theory asserts that the production of physical well-being requires the fulfilment of two instrumental needs: comfort (the satisfaction of physical needs and absence of stimuli that create discomfort, e.g. pain and hunger) and stimulation (an adequate level of physical and mental activation, e.g. pleasant levels of physical effort, excitement, and arousal). Social well-being is achieved by obtaining status (a person's relative ranking, e.g. the sense of being respected and having valued resources), affection (being loved for who one is, irrespective of one's actions or status, e.g. the feeling of being liked, loved, and accepted, provided mainly in caring relationships), and behavioural confirmation (the sense of doing the "right" thing according to oneself or relevant others, e.g. the sense of being useful and doing good things) (Lindenberg, 1996; Ormel et al., 1999; Steverink, 2014). Each of these instrumental needs can be realised by (multifunctional) means, that is activities and endowments. For example, intimate

ties contribute significantly to a person's affection level (Nieboer, Lindenberg, Boomsma, & van Bruggen, 2005; Ormel et al., 1999).

Self-management of well-being

Self-management abilities aid the effective achievement, maintenance, and restoration of physical and social well-being, ultimately leading to the realisation of overall subjective well-being (Steverink et al., 2005; Steverink, 2014). Overall self-management ability is defined as "a generative capacity (consisting of several sub-abilities) to take care of one's own important resources, that is resources that contribute to well-being" (Steverink & Lindenberg, 2008, p.182). The premise of this conceptualisation is that behavioural and cognitive abilities are connected to the dimensions of well-being (i.e. comfort, stimulation, status, affection, and behavioural confirmation) (Steverink et al., 2005; Steverink & Lindenberg, 2008). According to the self-management of well-being (SMW) theory (Steverink et al., 2005), the core interrelated and mutually reinforcing self-management abilities are cognitive abilities (self-efficacy beliefs and having a positive frame of mind), active motivational abilities (taking initiative and investment behaviour), and resource combining abilities (multifunctionality of resources and variety in resources). (1) Self-efficacy belief refers to a person's belief in his or her competence to effectively achieve goals and realise aspects of well-being; and (2) having a positive frame of mind entails the ability to have a positive perspective on the future instead of focusing on losses. In addition, (3) taking initiative reflects a person's self-motivation to realise aspects of well-being in contrast to being passive or dependent, and (4) investment behaviour refers to the ability to invest in resources for the long-term. Finally, (5) multifunctionality of resources refers to the simultaneous contribution of resources and activities to multiple aspects of well-being in a mutually reinforcing way, and (6) variety in resources refers to the contribution of multiple resources and activities to single aspects of well-being. Although each ability is important on its own, the strengthening of all interacting abilities results in improved self-management for the realisation or maintenance of resources to satisfy well-being needs in later life (Steverink & Lindenberg, 2008).

Productivity of interactions

People try to achieve universal well-being needs by actively producing essential means (realising instrumental needs, e.g. sufficient comfort and affection) in the light of available resources and constraints (Lindenberg, 2013; Ormel et al., 1999; Steverink & Lindenberg, 2008). Especially for frail older people with disabilities, illnesses, and functional limitations, goal attainment and continued participation in important activities are facilitated by individual relationships and other resources, and can reduce or avoid the deterioration of well-being (Cramm & Nieboer, 2016b; Nieboer, 2013). To realise needs that promote well-being, care should centre on a person's preferences, needs, values, and goals (Greene, Tuzzio, & Cherkin, 2012; Rathert, Wyrwich, & Boren, 2013; Wagner et al., 2005). Persons partnering with (teams of) healthcare professionals who promote participation in managing life situations, focus on goals relevant for the maintenance

of well-being, and provide effective (self-management) support and follow-up are more likely to achieve better outcomes (Bergeson & Dean, 2006; Wagner et al., 2005). Consequently, productive patient-professional interactions are assumed to be essential in co-producing the best possible patient outcomes, including well-being (Barr et al., 2003; Wagner et al., 2001; Wagner et al., 2005; WHO, 2015). Productive interactions between professionals and patients are characterised by accurate, frequent, timely, and problem-solving communication. Effective communication is supported by relationships based on mutual respect, and high levels of shared goals and knowledge, and vice versa (Batalden et al., 2015; Gittell, 2012; Gittell & Douglass, 2012). The maintenance or improvement of frail older people's well-being is more likely to be realised when patient-professional interactions are characterised by effective communication and high-quality relationships (Batalden et al., 2015; Gittell, 2012; Gittell & Douglass, 2012).

DATA AND METHODS

Study design and setting

This cross-sectional study included GP practices in western North Brabant Province, the Netherlands, and was conducted from mid-2014 to mid-2015. Fifteen of 17 GP practices approached agreed to participate. This study is part of a large-scale evaluation of proactive, integrated primary care for community-dwelling frail older people, which has been described in detail elsewhere (Vestjens, Cramm, Birnie & Nieboer, 2018).

Participants and inclusion

The study sample consisted of community-dwelling frail older people (aged ≥ 75 years). Recruitment of this sample consisted of two steps. First, the frailty of all 3545 older people (aged ≥ 75 years) registered at the 15 GP practices was assessed using a postal questionnaire which included the 15-item Tilburg Frailty Indicator (Gobbens, van Assen, Luijkx, Wijnen-Sponselee, & Schols, 2010). The TFI is a self-report user-friendly questionnaire used assess frailty in the physical, psychological, and social domains; persons with scores ≥ 5 (range, 0-15) are considered to be frail (Gobbens et al., 2010). Reminders were sent by mail and telephone to non-responders. A response rate of 83.4% (n = 2956) was achieved. As the TFI may not fully encompass all essential aspects of frailty, its use in isolation is not recommended (van Dijk, 2015). Therefore, persons whose TFI scores did not indicate frailty (TFI score < 5), could also be identified as frail based on additional examinations or interviews by healthcare professionals. Second, the sample of frail older people derived from the screening (TFI and/or additional frailty examination by healthcare professionals) was assessed by GPs and researchers on eligibility criteria for study participation. We excluded (1) frail older people living in nursing homes or homes for older people, (2) people with estimated life expectancies of < 3 months, and (3) people who were not able to communicate in Dutch. Furthermore, GPs assessed whether reasonable grounds to suspect incapacity to par-

ticipate and/or to give consent existed (e.g. due to cognitive problems), and people were excluded in such cases. Of 834 potential participants, 588 persons were willing to participate in this study (70.5% response rate).

Data collection

To collect data, interviewers administered the questionnaires during in-home face-to-face interviews. The interviewers lived in western North Brabant Province and had backgrounds in healthcare; they were trained to conduct the interviews. On average, interviews lasted 60-75 minutes.

Measures

Well-being

Well-being was measured using the short version of the validated Social Production Function Instrument for the Level of well-being (SPF-ILs) (Nieboer et al., 2005). This 15-item instrument measures overall well-being, as well as levels of social (behavioural confirmation, status, and affection) and physical (comfort, and stimulation) well-being (Nieboer & Cramm, 2018; Nieboer et al., 2005; Ormel et al., 1999; Ormel et al., 1997). Answers to the questions are given on a 4-point scale ranging from 1 (never) to 4 (always), and mean scores are calculated. Higher scores indicate greater well-being (Nieboer et al., 2005). The instrument has been shown to provide a reliable and valid assessment of social and physical well-being among older people (Nieboer & Cramm, 2018; Nieboer et al., 2005). The Cronbach's alpha value for overall well-being measured with the SPF-ILs in this study was 0.84, indicating a high degree of reliability. Cronbach's alpha values for social and physical well-being were 0.80 and 0.77, respectively.

Productive patient-professional interactions

Frail older people's perceptions of the productivity of interactions were measured using the validated relational coproduction instrument (Gittell, 2000, 2012; Gittell et al., 2000; Gittell, Godfrey, & Thistlethwaite, 2013). In this study, productivity of interactions with GPs was assessed. The relational coproduction instrument consists of seven survey questions assessing dimensions of communication (frequency, timeliness, accuracy, and problem-solving nature) and relationships (mutual respect, shared goals, and shared knowledge). Together, these dimensions form the productive interaction construct (Gittell, 2000, 2012; Gittell et al., 2000; Gittell et al., 2013). The seven items are rated on a 5-point scale ranging from 1 (never) to 5 (always), and mean scores are calculated. Higher scores represent higher-quality interactions with the GP, as perceived by frail older people. The Cronbach's alpha value for the relational coproduction instrument in this study was 0.86, indicating a high degree of reliability.

Self-management abilities

The self-management abilities of frail older people were measured using the short version of the Self-Management Ability Scale (SMAS-S) (Cramm, Strating, de Vreede, Steverink, & Nieboer, 2012; Schuurmans et al., 2005). This 18-item questionnaire assesses a diverse repertoire of self-management abilities for the maintenance of physical and social well-being. The SMAS-S assesses cognitive abilities (self-efficacy beliefs and a positive frame of mind), active-motivational abilities (taking initiative and investment behaviour), and resource-combining abilities (multifunctionality of resources and variety in resources) (Cramm et al., 2012; Schuurmans et al., 2005). Mean SMAS-S scores range from 1 to 6, with higher scores indicating better self-management abilities. The Cronbach's alpha value for the SMAS-S in this study was 0.91, indicating a high degree of reliability.

Socio-demographic variables

The questionnaire contained items regarding the persons' age, sex, educational level, marital status, and (multi)morbidity. Morbidities were indicated on a list of 17 conditions, including diabetes, Chronic Obstructive Pulmonary Disease, heart failure, and hearing disorders. Educational level (elementary school or less and more than elementary school), marital status (married/living together and single/widowed/divorced), and (multi)morbidity (0 or 1 condition and ≥2 conditions) were dichotomised.

Ethical considerations

The medical research ethics committee of the Erasmus Medical Centre in Rotterdam, the Netherlands, reviewed the research proposal (study protocol number MEC-2014-444) and determined that the rules laid out in the Medical Research Involving Human Subjects Act did not apply. Frail older people were informed by telephone and during in-home visits about the study (e.g. purposes, procedures, confidentiality, and contact information for the researchers and interviewers). In addition, participants received a leaflet containing relevant research information. Written informed consent to participate in the study was obtained from all participants.

Statistical analyses

The socio-demographic characteristics of study participants were analysed using descriptive statistics. Bivariate associations between the study variables (self-management abilities, productive interactions, and well-being) were analysed using Pearson correlation coefficients. Linear mixed-effects models (588 frail older people nested in 15 GP practices) were employed to investigate relationships of self-management abilities and productive interactions with GPs to well-being (social, physical and overall). A random intercept was used on the GP practice level. The outcome estimates were adjusted for socio-demographic characteristics (age, sex, educational level, marital status, and multimorbidity). Social, physical and overall well-being served as the dependent variables, and the productivity of interactions and self-management abilities

served as independent variables. Assumptions of linear models (including linearity, normality, multicollinearity, homoscedasticity, and significant outliers) were tested and no large violations were found. In addition, we found no indication of a mediating effect between the variables (Hayes, 2018). Results were interpreted as significant when two-sided *p*-values were <0.05. The software package IBM SPSS (version 24 for Windows; IBM Corporation, Armonk, NY, USA) was used for all statistical analyses.

RESULTS

Table 1 shows descriptive statistics for the socio-demographic characteristics of the study sample, well-being, self-management abilities, and the productivity of interactions with GPs. Of the 588 participants, 68.5% were women, 61.7% were single, and 38.4% had low educational levels. Their mean age was 82.32 (standard deviation (SD), 5.19; range, 75-98) years. Almost 90% of the frail older people reported multimorbidity (≥2 conditions). The mean SPF-ILs score for overall well-being was 2.640 (SD, 0.492; range, 1-4). Mean scores for physical and social well-being were 2.578 (SD, 0.615; range, 1-4) and 2.678 (SD, 0.553; range, 1-4), respectively. The mean SMAS-S score for self-management abilities was 3.670 (SD, 0.879; range, 1-6) and the mean score for the productivity of interactions with GPs was 3.78 (SD, 1.144; range, 1-5).

Table 1 Descriptive statistics for socio-demographic characteristics, well-being, self-management abilities, and productive interactions among frail older people, *N* = 588

	Mean ± SD (range) or n (%)	*n*
Age (years)	82.32 ± 5.19 (75-98)	588
Sex (women)	403 (68.5%)	588
Marital status (single)	363 (61.7%)	588
Educational level (low)	226 (38.4%)	588
Multimorbidity (≥ 2 diseases)	523 (89.6%)	588
Overall well-being	2.640 ± 0.492	578
Physical well-being	2.578 ± 0.615	581
Social well-being	2.678 ± 0.553	570
Self-management abilities	3.670 ± 0.879	583
Productive interactions with GPs	3.783 ± 1.144	576

Table 2 shows the correlations among self-management abilities, the productivity of interactions with GPs, and well-being. Significant correlations were found between self-management abilities and overall (r = 0.701), physical (r = 0.589), and social (r = 0.603) well-being (all $p < 0.001$). Significant weak correlations were found between the productivity of interactions with GPs and overall (r = 0.162) and social (r = 0.225) well-being (both $p < 0.001$), but not with physical

well-being (p = 0.603). Self-management abilities were correlated weakly with the productivity of interactions with GPs (r = 0.126, p < 0.01).

Table 2 Pearson correlations among self-management abilities, productive interactions, and well-being among frail older people, N = 588

	Physical well-being	Social well-being	Overall well-being
	r	*r*	*r*
Self-management abilities	0.589***	0.603***	0.701***
Productive interactions with GPs	0.022	0.225***	0.162***

***p < 0.001 (two-tailed).

Table 3 displays the results of the linear mixed-effects models. Analyses controlled for socio-demographic characteristics revealed significant relationships between self-management abilities and overall, physical, and social well-being (all p < 0.001). They also revealed significant relationships between the productivity of interactions with GPs and overall (p < 0.05) and social (p < 0.001) well-being, but not physical well-being (p = 0.212).

Table 3 Relationships between self-management abilities, productive interactions, and well-being while controlling for socio-demographic characteristics, as revealed in linear mixed-effects models, among frail older people, N = 588

	Physical well-being		Social well-being		Overall well-being	
	n = 571		*n* = 560		*n* = 568	
	B	SE	B	SE	B	SE
Constant	0.720	0.367	0.954**	0.337	0.701**	0.264
Age (years)	0.012**	0.004	0.003	0.004	0.006*	0.003
Sex (women)	0.081	0.047	0.047	0.044	0.084*	0.034
Marital status (single)	0.051	0.042	-0.033	0.038	-0.003	0.034
Educational level (low)	0.019	0.042	-0.022	0.038	-0.014	0.030
Multimorbidity (≥ 2 diseases)	-0.164*	0.067	-0.066	0.061	-0.125**	0.048
Self-management abilities	0.376***	0.025	0.360***	0.023	0.391***	0.017
Productive interactions with GPs	-0.022	0.018	0.073***	0.016	0.032*	0.013

*p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed).

DISCUSSION

This study aimed to investigate the relationships between community-dwelling frail older people's self-management abilities, productive patient-professional interactions and well-being, while controlling for socio-demographic characteristics. The study shows that self-management abilities were related significantly to physical, social, and overall well-being in this study sample. The productivity of interactions with GPs was related significantly to social and overall well-being, although the effect sizes were small.

Well-being and self-management

The finding of relationships between self-management abilities and well-being in a sample of community-dwelling frail older people underlines the importance of strengthening these abilities to manage resources to maintain well-being, and to effectively avoid or cope with losses, in later life (Steverink et al., 2005). The relative difficulty of fulfilling well-being needs increases with age as the availability of resources and opportunities to satisfy needs alters and declines (Steverink et al., 1998; Steverink, 2014). In the process of ageing, reserves and resources in several life domains decline, and losses in one domain can reinforce resource-loss in other domains, necessitating the possession of adequate and diverse self-management abilities (Steverink et al., 2005). According to Frieswijk and colleagues (2006), frail older people with deficits in multiple domains may benefit from interventions to improve general self-management abilities aimed at maintaining all aspects of well-being, instead of single target (health) problems (Frieswijk, Steverink, Buunk, & Slaets, 2006). Dutch governmental policies aim to enhance self-sufficiency and independent living in the community for as long as possible (de Klerk, Verbeek-Oudijk, Plaisier, & den Draak, 2019; van Campen, Iedema, Broese van Groenou, & Deeg, 2017), which makes the effective self-management of well-being even more important.

Well-being and productive patient-professional interactions

The present study showed that productive interactions with GPs in the primary care setting were related significantly to the social well-being and overall well-being (the joint production of physical and social well-being) of community-dwelling frail older people, even after controlling for self-management abilities (although the effect sizes were small); no significant relationship with physical well-being was found. This finding is in line with those from a recent cross-sectional study among patients with multimorbidity in the Netherlands. This study showed that productive interactions with healthcare professionals (GPs, nurse practitioners, and specialists) were related significantly to social well-being, but not physical well-being (Kuipers et al., 2019). The productivity of patient-professional interactions, as measured with the relational coproduction instrument (Gittell, 2000), consists largely of social aspects (e.g. quality of the patient-professional relationship based on mutual respect, and high levels of shared goals and knowledge) and may thus relate mainly to social well-being goals (Kuipers et al., 2019). In addition, a study of

Nieboer and Cramm (2018) has shown that frail older people report lower physical well-being levels compared with a general sample of community-dwelling older people. Frail older people reported lower comfort and stimulation levels, which serve as resources for physical well-being (Nieboer & Cramm, 2018). As frailty is related to developing adverse health outcomes (e.g. disability, falls, and hospitalisation) (Vermeiren et al., 2016), frail older people may experience more difficulties with physical well-being. It may be more difficult to affect physical well-being of frail older people through the quality of the patient-professional relationship and communication. The productivity of interactions with GPs explains only a small part of well-being; other factors contributing to older people's well-being include personal resources (Pinquart & Sörensen, 2000) and neighborhood characteristics (e.g. social cohesion) (Cramm, van Dijk, & Nieboer, 2013; Cramm & Nieboer, 2015d; Oswald, Jopp, Rott, & Wahl, 2011). Although the effect sizes in our study were small, our findings suggest that productive patient-professional interaction may be a resource for the maintenance of well-being and prevention of a decline in needs contributing thereto when facing age-related changes in physical, psychological, and social domains (Williams, Haskard, & DiMatteo, 2007).

GPs may contribute significantly to their frail older patients' social and overall well-being outcomes by investing in productive interactions with them. Effective communication between healthcare professionals and frail older people should therefore not focus solely on biomedical and psychosocial domains but should include emotional and affective care (Williams et al., 2007). A trusting patient-professional relationship can be considered to be central in the care process and may be therapeutic for patients, especially frail older people with multimorbidity (Williams et al., 2007). However, widespread problems with communication and collaboration between patients and healthcare professionals have been reported (Øvretveit, 2012). Suboptimal patient-professional communication involves healthcare professionals' failure to create environments and relationships that enable effective communication, suboptimal communication skills, patients' withholding of information, and healthcare professionals' failure to provide (understandable) information during consultations or about medications (Øvretveit, 2012). Problems with patient-professional collaboration include non-attendance of scheduled appointments, time constraints with respect to consultations, a lack of continuity with healthcare professionals, and the under-involvement of patients in decision-making processes (Øvretveit, 2011; Øvretveit, 2012). Suboptimal patient-professional communication and collaboration can hinder productive interactions (Cramm & Nieboer, 2015c). The findings of our study imply the need for healthcare professionals to invest in the quality of communication and relationships with frail older people. To enhance the productivity of interactions, frail older people need to be informed and activated; to whatever degree possible, they need to have goals and plans to protect or improve their health and well-being. To become active partners and wise decision-makers in their care processes, frail older people need high-quality information, and adequate skills, motivation, and confidence to manage their conditions and well-being effectively. They need to understand the importance

of information sharing and their own roles in managing their health and satisfying well-being needs. For interactions to be productive, healthcare professionals, including GPs, should be organised, equipped, and trained to conduct productive interactions with frail older people. They need relevant expertise, time, resources and patient information (Bodenheimer, Wagner, & Grumbach, 2002a, 2002b; Wagner, Austin, & Von Korff, 1996; Wagner et al., 2001; Wagner et al., 2005). The support of frail older people in protecting (the potential loss of) well-being requires relational competence to consider their preferences, needs, values and goals, empathise with their situations, and respect their needs and choices (Cramm & Nieboer, 2012; Cramm & Nieboer, 2015c).

Study limitations

Several limitations of this study should be considered. First, the cross-sectional design limited the investigation of causal relationships. The relationships of self-management abilities and productive interactions to well-being may be dynamic, and longitudinal research of these relationships among community-dwelling frail older people is recommended. Second, the study population was derived from a single province in the Netherlands, which may hamper the generalisability of our findings to other areas and populations of older people. Third, no information was available from non-responders in the study. Non-response to (postal) questionnaires may introduce bias (Edwards et al., 2002); for example, frailty may have been higher among non-responders. Fourth, in the present study, an integral perspective on frailty as defined by Gobbens and colleagues (2010b) was employed in which physical, psychological, and social domains of human functioning are incorporated and operationalised in the multidimensional TFI (Gobbens et al., 2010b). There is, however, still considerable uncertainty about an internationally recognised and comprehensive definition of frailty (Bergman et al., 2007; Brown & Covinsky 2018; Dent, Kowal, & Hoogendijk, 2016). Disagreements continue about what conceptual frailty approaches should be adopted (Hoogendijk et al., 2019), and instruments used to assess frailty in older people are based on different conceptualisations of the phenomenon. Dominating perspectives in the field include a frailty phenotype in which frailty is defined as a biological syndrome (Fried et al., 2001) or a multifactorial perspective on frailty by the accumulation of health deficits (Mitnitski, Mogilner, & Rockwood 2001; Rockwood & Mitnitski 2007). Increasingly, research on frailty stresses the need for a multidimensional perspective (Dury et al., 2018) in which not only physical aspects dominate but the contribution of multiple domains is taken into account (e.g. psychological, social, cognitive, and environmental) (De Witte et al., 2013; Gobbens et al. 2010b; Gustafsson, Edberg, & Dahlin-Ivanoff, 2012; Markle-Reid & Browne, 2003). Based on the continuous debate on defining frailty and its measurement, the TFI may not fully encompass all relevant aspects. However, the TFI is frequently used in the Netherlands and other countries in Europe (Op het Veld et al., 2019). The psychometric properties of the TFI have shown to be good (i.e. good internal consistency and construct validity) (Gobbens, van Assen et al., 2010; Gobbens et al., 2020; Metzelthin et al., 2010). A systematic review of Sutton and colleagues

(2016) comparing multicomponent frailty assessment tools has shown that the TFI has the most robust evidence supporting its reliability and validity. Fifth, other potentially important determinants of (relationships among) self-management abilities, productive interactions, and well-being were not investigated. For example, the quality of care delivery has been shown to be a significant determinant of self-management abilities (Cramm & Nieboer, 2015a) and productive patient-professional interactions among chronically ill patients (Cramm & Nieboer, 2014) and community-dwelling frail older people (Vestjens, Cramm, & Nieboer, 2019). In addition, research of Dury and colleagues (2018) has shown that frail older people possess balancing factors for frailty (i.e. resources to fulfil psychological, social, physical, environmental, and/or cognitive challenges). Balancing factors were present at the individual (e.g. resilience), environmental (e.g. neighbourhood characteristics), and macro level (e.g. financial income), and might contribute to dealing effectively with frailty and increase positive outcomes, such as maintaining well-being. Also, negative and positive turning points and life events such as death of the partner or birth of a grandchild might affect their frailty and outcomes (Dury et al., 2018). In the current study, balancing factors were not explicitly considered, although multiple balancing factors may (partly) overlap or interact with, for example, self-management abilities (e.g. abilities and resources to stay positive or invest in social contacts). Sixth, moderate associations found between frail older people's self-management abilities and their well-being may be explained (partly) by the use of the SMW theory (Steverink et al., 2005), which is based on the SPF theory (Lindenberg, 1996). The core abilities specified in the SMW theory form the construct of self-management ability and are linked explicitly to the dimensions of well-being proposed in the SPF theory (Steverink et al., 2005). Finally, only the productivity of interactions with the GPs was examined, not those with other healthcare professionals in the primary care setting such as elderly care physicians and home care nurses. GPs serve a gatekeeping function and are central actors in primary care (Kroneman et al., 2016; van Campen et al., 2013). Other studies have shown that interactions with GPs tend to be more productive than those with other healthcare professionals (Cramm & Nieboer, 2015c; Cramm & Nieboer, 2016a). This may be explained by the central role of GPs in the Dutch primary care system and the nature of their relationships with older people. GPs are among the most frequently contacted healthcare professionals in primary care, and they often have long histories with their patients (Jansen, Spreeuwenberg, & Heijmans, 2012; Kroneman et al., 2016). These factors may provide more opportunities for the strengthening of relationships and communication between GPs and frail older people. Further investigation of the productivity of interactions with other healthcare professionals is recommended.

Conclusions

It can be concluded that self-management abilities and productive patient-professional interactions are related to the well-being of community-dwelling frail older people in the Netherlands. In a time of ageing populations with associated frailty, investment in self-management abilities

and productive patient-professional interactions in GP practices is expected to be beneficial for the well-being of frail older people.

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