

Accompanying patients aged 65 or over: how companions' health literacy affects value co-creation during medical encounters

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Abstract

Objectives: The recent health crisis has led to a tightening of visitor policies during medical consultations. This work studies the relationship between the companion's health literacy (functional, interactive and critical) and the companion's co-creation of value (co-production and value in use).

Methods: Six hypotheses are tested by means of a sample of companions of chronically-ill patients over the age of 65, using structural equation modeling.

Results: Functional literacy does not predict the co-creation of value through either of its dimensions (co-production and value in use). Interactive literacy has a positive influence on co-production and a negative influence on value in use. Critical literacy only positively influences value in use.

Discussion: Merely understanding the health information is not sufficient for the companion to be recognized as a collaborator or "ally" of the doctor. It is necessary to encourage the companion's communication and critical evaluation skills.

Keywords: Health literacy; Co-creation value; Co-production; Chronic Conditions; Older adults; Family; Companion; Health services.

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Introduction

In primary care consultations involving the elderly, it has been shown that the accompanying family-members play a beneficial role, facilitating the exchange of information and informed medical decision-taking between patients and doctors (Wolff et al., 2017). Healthcare professionals possess the technical knowledge (clinical) and the patients (the users) have the knowledge of their lives and their own condition, meaning the interaction and the collaboration between the two is essential to improve the results of the service (Black & Gallan, 2015; Hau et al., 2017; McColl-Kennedy et al., 2012). This collaborative work between the providers and users of the service in order to maximize the positive results is known as value co-creation (Holland-Hart et al., 2019; Osborne, Radnor, & Strokosch, 2016) and is delimited through co-production and value in use (Oertzen *et al.*, 2018; Ranjan & Read, 2016).

In the context of chronic diseases, different activities of value co-creation carried out by the family have been analyzed and it has been shown that they improve the well-being of the patients and their families (Lam & Bianchi, 2019). The co-creation of value requires that carers possess information on the health conditions of the family members they care for, are aware of the symptoms and existing treatments for their illness and the support services available. Not only do carers need to access information, they also need to understand, evaluate and apply the health information in order to communicate with health professionals and be able to organize the care of their relatives. This set of skills is commonly referred to as health literacy (Sørensen et al., 2012).

In previous work, it has been observed that literacy is positively related to the co-creation of value (Mende & van Doorn, 2015; Virlée, Hammedi, & van Riel, 2020; Virlée, van Riel, & Hammedi, 2020). However, to date no study is known to analyze the effect of the dimensions of health literacy on the co-creation of value. The objective of this work is to analyze the health literacy of the family-member carers who accompany the patient to the medical consultation, distinguishing the functional, interactive and critical domains and investigating their relationship with their co-creation of value. The data have been obtained from a sample of 907 companions of patients with chronic illnesses over the age of 65.

Conceptual Framework and Research Hypotheses

The companion during medical encounters

Currently, people over the age of 65 represent 9% of the world's population and it is estimated that this figure will double over the next 30 years, with the number of octogenarians quadrupling (WHO, 2020). The aging of the population and social behavior are contributing to the increase of the incidence of chronic illnesses (Figgis, 2017). Chronic illnesses are diseases that persist throughout life and require continuous and permanent care, placing an important burden on patients, families and society as a whole, as well as on health systems. Furthermore, the health crisis provoked by COVID-19 has highlighted the vulnerability of chronically-ill elderly patients, who have shown high levels of mortality and serious illness, difficulties to access essential treatments, and acute levels of stress, anxiety and loneliness during confinement (UNECE, 2020).

In this context, the family plays a fundamental role in the care of chronically-ill elderly patients, for example, by helping with personal care and with domestic activities (such as bathing, dressing, preparing meals, shopping), carrying out medical and nursing tasks (dressing wounds, administering medication and handling medical instruments, among others), maintaining contact with healthcare professionals, or accompanying the patient to medical consultations. Caring for the health of a relative is a multifaceted activity which requires knowledge and skills in different domains (Given, Sherwood, & Given, 2008) and can be very stressful when the patient suffers from serious health problems (Sevick et al., 2007; Weiss, 2007).

During the medical consultation, the family is the “watchdog of patient accuracy” who can help the doctor receive complete and accurate information regarding the patient (Laidsaar-Powell *et al.*, 2017, p. 4). The family can supplement the functional, sensorial or cognitive limitations of the elderly patients and contribute to a style of communication of shared understanding. “Shared understanding implies an equal and natural type of communication style, which is the opposite of scripted communication. Scripted communication is formal or standardized communication” (Matusitz & Spear, 2015, p. 873). When a scripted style is adopted, a script tends to be followed in the communication and questions are usually answered using set phrases learnt in past situations. In these cases, there are few opportunities for the exchange of information beyond the scripted information, making it more difficult for personal concerns to arise (Blackman, 2002). On the other hand, shared understanding requires communication skills for the adaptation of the message and for the encouragement of collaborative interactions (Rawlins, 2009).

Health literacy

Health information is complex and therefore difficult for many people to understand and this can generate serious problems in the accessing, quality and costs of the health services (Davis et al., 2006; Koh et al., 2012; Parker, Ratzan, & Lurie, 2003). Health literacy is a concept that arises to address the challenges of medical information. Early research was developed in the clinical field and focused on the negative effects of low health literacy. Low health literacy is a “risk factor” that can lead to non-compliance with medical indications and errors in the administration of treatment. Other researchers have followed a public health management approach and consider health literacy as an “asset” of the people that allows them to maintain and improve their health (Nutbeam, 2008, p. 2077). This dual perspective of study has given rise to many definitions of health literacy (Bröder et al., 2018; Malloy-Weir et al., 2016; Peerson & Saunders, 2009; Sørensen et al., 2012), but in general all, explicitly or implicitly, use as their source the definitions of the American Medical Association, the Institute of Medicine, and the World Health Organization (WHO), which focus on “the skills necessary for an individual to obtain, process and understand health information and services facilitating healthy decision-making” (Guzys et al., 2015, p. 2).

Health literacy is of particular importance for patients with chronic illnesses as they require continuous medical treatment, complex care and repeated interactions with healthcare professionals (Artinian et al., 2010). In this group of patients, it has been observed that low health literacy is associated with a poor quality of life, a lack of adherence to management protocols, minimum or no self-care, greater health costs, and increased morbidity and mortality (Berkman et al., 2011; Taylor et al., 2018; White, Chen, & Atchison, 2008).

Health literacy is a concept that arises to address the challenges of medical information. Based on research on education, Nutbeam (2000) distinguishes three domains of health literacy (functional, interactive and critical). Each domain of literacy requires more advanced skills that reflect greater autonomy and commitment in health behaviors. This approach has been widely argued in the literature (Chinn, 2011; Ishikawa, Takeuchi, & Yano, 2008; Sykes, Wills, Rowlands, & Popple, 2013) and is that followed by this work.

Functional literacy refers to cognitive reading, writing and arithmetic skills that people have to apply in their daily healthcare activities, that is, among others, understanding medical reports, prescriptions, patient information leaflets, and other everyday information resources. They are skills of great relevance in clinical practice to understand the indications of doctors and to avoid interpretation errors. In this sense, it has also been referred to as “clinical health literacy” (Pleasant & Kuruvilla, 2008) and “medical literacy” (Peerson & Saunders, 2009).

Interactive literacy involves cognitive and communication skills which permit the exchange of information with different sources. Access to information, although it requires skills, does not guarantee being able to take advantage of it. It is important that the companion is prepared to access medical information at the right moment and exchange it with different sources (for example, the Internet, newspapers, patient associations, official organizations, relatives, people in the community) and in different formats (news, reviews, reports, advertisements, interviews, videos). These skills facilitate doctor-patient interaction and the active participation of the patient (Haun et al., 2014).

Critical literacy completes the set of skills which make up health literacy with the skills related to the critical analysis of information and the application of said information to specific situations in different contexts of life (Sykes et al., 2013). It represents skills related to the management of different sources of information and to the capacity to synthesize, recall, judge, extract relevant information, and derive meaning (Chinn, 2011).

Value co-creation

Research on service management recognizes the need to involve the service users and their personal network in an effort of joint value production (Beirão, Patrício, & Fisk, 2017; Danaher & Gallan, 2016). The dominant logic of service (LDS) (Vargo & Lusch, 2016) argues that service providers are not the only producers of value, rather that value is created by means of a collaborative effort between users and service providers. People’s access to information, other resources and skills help ensure that the provider-service user encounter establishes a favorable environment and the motivation to create value (Payne et al. 2008).

Value co-creation is defined as “benefit realized from the integration of resources through activities and interactions with collaborators in the customer’s service network” (McColl-Kennedy et al., 2012, p. 375). While value is always created jointly, one particular beneficiary evaluates it (Vargo & Lusch, 2008), it is exclusive to each person and, consequently, cannot be measured objectively (Edvardsson, Tronvoll, & Gruber, 2011). That is to say, the value is perceived, interpreted and constructed according to the perspective of the person who participates in the co-creation of value (Jaakkola & Alexander, 2014; Plé, 2016). Following the work of Oertzen et al. (2018) and Ranjan and Read (2016), the co-creation of value is delimited in this work through co-production and value in use.

Co-production consists of the participation of the clients in activities that traditionally have been considered as business tasks and that are essential for the results of the service. The clients act as “part-time employees of the organization” (McColl-Kennedy et al., 2012, p. 371), carrying out activities in which control resides predominantly with the service provider, who determines the nature and the extent of the co-production (Vargo & Lusch, 2004). Thus, the clients can help the staff of the clinic administer treatments, make proposals for medicine dosage, or suggest initiatives to reduce waiting time. This value co-creation domain is manifested through the exchange of knowledge (the company and client sharing ideas and skills to evaluate needs and generate competencies in the provision of the service), equity (it presupposes the willingness of the supplier to share control in favor of the users of the service, facilitating the user’s empowerment) and interaction (dialogue and exchange of information to adapt the resources to the needs of the context and increase the possibility of generating satisfactory solutions).

The value in use of the service emerges when the client uses, maintains and adapts the proposal of the company's service to a specific context (Vargo & Lusch, 2004). For this reason it is said to be co-created in the context of use of the client (Edvardsson et al., 2011) and that it is mostly outside the control of the service provider (Grönroos, 2006; Heinonen & Strandvik, 2015; Moeller, 2008). The research argues that the value in use is derived from the experience of the client with the company (empathetic, emotional and memorable actions which have an intrinsic value for the client), the personalization (adaptation of the process of use to the client's particular characteristics) and the relationship (reciprocal and iterative communication with the service provider that favors the exchange of mutual resources and the commitment to find appropriate solutions).

Health literacy and the co-creation of value

Information is a resource and in itself has no intrinsic value. It becomes valuable when it is integrated with other resources in a specific context (Frow, McColl-Kennedy, & Payne, 2016). This means that people who have access to the same resources may perceive different benefits depending on their skills and abilities (Virlée, van Riel, & Hammedi, 2020). Service provider-client interactions must provide a propitious climate so that both parties can have consistent expectations regarding the use of the resources available (Plé & Cáceres, 2010), and must involve themselves and participate actively in the co-creation of value (Auh et al., 2007; Dong & Sivakumar, 2017).

The literature on professional services sustains that the more the clients know about the services of the company, the easier it will be for them to understand how they can provide information to the service supplier and how they can work together to customize the service (Auh et al., 2007). Empirical research has demonstrated that literacy in the service facilitates co-production activities in health services (Virlée, Hammedi, & van Riel, 2020) and in financial services (Mende & van Doorn, 2015). It has also been observed that patients with less functional literacy ask their doctors fewer questions (Katz et al., 2007). Likewise, the development of education initiatives is recommended so that clients understand important concepts of the service as it is likely that they will then perceive greater value in the service (Eisingerich & Bell, 2008).

Therefore, we posit that:

H1a: The functional health literacy of the companion is positively associated with the co-production of the companion.

H1b: The functional health literacy of the companion is positively associated with the value in use of the companion.

The patients who have developed the habit of searching for information and increasing their knowledge of health matters participate more actively in the consultations (Osei-Frimpong et al., 2018), and feel comfortable in the relationship with the doctor, which in turn may improve their ability to search for information and share it with others (Golbeck et al., 2005). These social and cognitive skills (interactive health literacy) facilitate dialogue, shared language and meaning with the health professionals, which are key to value co-creation (Keeling, Laing, & De Ruyter, 2018).

Quality dialogue allows people to exchange detailed information, clarify and improve their comprehension of the different options, which makes learning easier (Bebbington et al., 2007) and generates a shared meaning (Gergen et al., 2002). Also, dialogue can lead to the resolution of the tensions that inevitably arise between the service provider and the client (Grönroos & Voima, 2013) as a result of the misalignment of their objectives and practices (Wang et al., 2019).

H2a: The interactive health literacy of the companion is positively associated with the co-production of the companion.

H2b: The interactive health literacy of the companion is positively associated with the value in use of the companion.

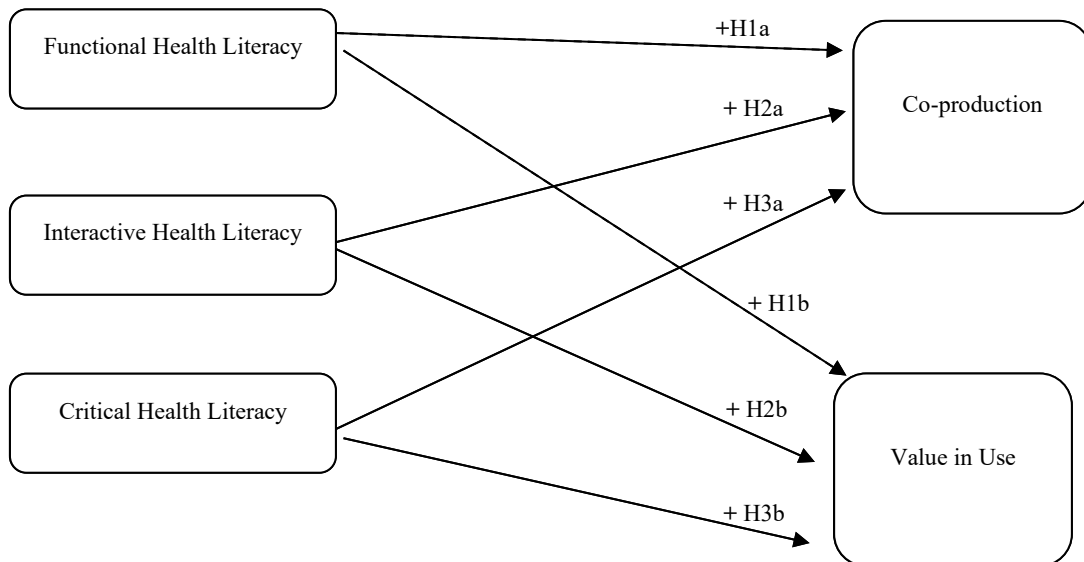
Critical health literacy helps improve people’s ability to process information and take health decisions (Palumbo et al., 2016). In comparison with people less literate in health, the most literate are generally more informed about health problems and take decisions with better information (Meppelink et al., 2015). The complexities and dependencies and, in consequence, tensions are elements of collaborative relationships (Mele, 2011; Powers et al., 2016) and are not a negative attribute (Laamanen & Skålén, 2015), but rather they serve as a catalyst for the emergence of new shared meanings (Wang et al., 2019) and the strengthening of the collaborative relationship. We assume that critical literacy helps to assimilate the context of the collaborative relationship and its complexity. Consequently, we posit that:

H3a: The critical health literacy of the companion is positively associated with the co-production of the companion.

H3b: The critical health literacy of the companion is positively associated with the value in use of the companion.

Based on the previous theoretical background, Figure 1 presents the relationships to be tested.

Figure 1. Health literacy and the co-creation of value: proposed hypotheses



Methodology

Sample

This work is part of a more extensive work which studies the experience of the companion in the consultation of chronically-ill elderly patients (Suárez-Álvarez, Suárez-Vázquez, & Río-Lanza, 2021; Suárez-Vázquez, Suárez-Álvarez, & Río-Lanza, 2020). The data were collected from companions of patients over the age of 65 with chronic illnesses who attended the consultation of a specialist doctor (ruling out diseases associated to dementia or which entail a loss of mental capacities). The interest in chronic illnesses is justified by the increase in their prevalence and by the condition of long-term disease which requires behavioral changes, with the aim of preventing the progression of the illness and an improvement in the quality of life (Entwistle et al. 2018). In this context, the patients usually attend the doctor's appointment accompanied by a relative (Kim, 2019) and companion value co-creation takes on special relevance.

The information was gathered through online surveys involving residents in Spain who met the following conditions: be over the age of 18, be a relative of a chronically-ill patient, and have accompanied the patient to a scheduled medical appointment at least once during the year prior to the study, not having received payment or any other consideration for said accompaniment.

The participants were identified and recruited through trained collaborators, full-time business students who, in exchange for course credits, recruited respondents via convenience sampling both in their own environment and in health centers. This kind of sampling approach has been used in previous studies which focused on health services (Náfrádi et al., 2018). The subjects were asked to complete an online questionnaire. The surveys were available through a link to a Google Form document. The participants were duly informed of the objectives of the study and that participation did not expose them to any risk. All gave their consent to voluntarily participate in the study and the confidentiality of the data provided was assured.

A sample of 907 companions was obtained. The data were gathered prior to the COVID-19 pandemic. The average age of the sample is 40 and 61% of the subjects are women. With regard to the accompanied patient, the average age is approximately 75 and the most frequent chronic illness is related to the medical specialty of cardiology, followed by orthopedic surgery and traumatology, endocrinology and nutrition and medical oncology. These characteristics of the sample are consistent with the current situation of the chronically-ill elderly in Spain, according to the information provided by the Online Aging Laboratory (CSIC, 2019).

Measurement scales

The questionnaire designed has taken into consideration the previous literature related to the variables of interest (co-creation of value and health literacy) and the measurement scales have been adapted to the specific context of the companion. A preliminary version of the questionnaire was pretested on 45 companions. The final measurement scales are indicated in the Appendix.

The literacy of the companion was measured using the FCCHL scale (Functional Communicative and Critical Health Literacy). We used the version adapted by Heijmans et al. (2015) in which the response options of Functional Health Literacy measure the frequency of the literacy behaviors (from "never" to "often"), while the response options of Communicative and Critical Health Literacy evaluate the difficulty experienced in literacy behaviors (from "easy" to "quite difficult"). The companion value co-creation was evaluated through the existing scales Chen et al., (2011), Chathoth et al., (2013), Etgar (2008), Heinonen and Strandvik (2009), Lemke et al., (2011), Macdonald et al., (2011), Merz et al., (2009), Moeller (2008), Parry et al., (2012), and Ranjan and Read (2016). Also, to adapt the scales to the context of the study, the

works on health services of Laidsaar-Powell et al. (2013), Osei-Frimpong et al., (2015) and Sweeney et al., (2015) have been taken into account. In all cases a 7-point scale was used.

Following the methodological recommendations of Anderson and Gerbing (1988) and Churchill (1979), we evaluate the psychometric properties (reliability, convergent validity and discriminant validity) of the measurement scales used. Firstly, an exploratory factorial analysis was carried out with the set of items proposed. The results show two dimensions or constructs which refer to co-production and value in use and three dimensions which express functional, interactive and critical literacy, respectively.

A confirmatory factorial analysis (CFA) was then performed, by means of the program EQS, version 6.2 for Windows. In agreement with the results of the CFA (Table 1), some of the initial items were removed and the convergent validity was confirmed: the items rely significantly and substantially on their respective theoretical constructs. Reliability was evaluated using composite reliability (CR) and the average variance extracted (AVE), the indicators showing acceptable values (Bagozzi & Yi, 1988). Discriminatory validity is also checked as the squared correlation between each pair of factors is less than the AVE of each factor (Fornell & Larcker, 1981), and the confidence intervals of the correlation between factors do not include value 1 (Table 2).

Results

The hypotheses of the research have been tested using structural equations and the program EQS, version 6.2 for Windows. The results of the analysis are shown in Table 3. Firstly, it can be observed that the goodness-of-fit indexes are acceptable, exceeding the minimum recommended threshold in all cases. In this way, it is observed that functional health literacy of the companion does not have a significant relation with either co-production or value in use, so corroborating neither H1a, nor H1b. Interactive health literacy of the companion shows a significant and positive relation with co-production (H2a). Also, the relation with value in use (H2b) is significant but of the opposite sign to that posited. H3a is not corroborated, as critical health literacy of the companion shows a non-significant relation with co-production, and a positive relation with value in use (H3b). These results are discussed in the following section.

Discussion

The COVID-19 pandemic has struck the elderly particularly hard. Apart from the consequences on their physical health, the effect of changes in health policies must be added, which affect the way in which the elderly cope with their illness. Thus, in an attempt to mitigate the consequences of social interaction in the new health context, many institutions have tightened their visiting regime, limiting the role of companions to cases considered essential. When defining the exceptional situations in which the presence of a companion of an elderly patient is deemed essential, it should be taken into account what exactly the contribution of the companion is, in the context of a medical consultation. This work considers that said contribution is not homogeneous and that the companions' contribution to the generation of value during a medical consultation may be related to their level of literacy.

The collaboration of the family with the doctor is vital to achieve positive results for all concerned; for patients and their families, for doctors and for society as a whole. It is time to prepare and "look after" the family so that they might provide high quality care, sustainable over time (Berry et al., 2020). Accordingly, this work offers four contributions, focusing on the family member who accompanies the patient to the medical consultation.

Table 1. Measurement scales: reliability and convergent validity

Concept	Standardized parameters	Robust t-value	Composite reliability (CR)	Average variance extracted (AVE)
Functional health literacy (F1)			0.885	0.614
FHL1	0.506	15.700		
FHL2	0.749	28.492		
FHL3	0.868	36.761		
FHL4	0.905	42.988		
FHL5	0.826	37.945		
Interactive health literacy (F2)			0.850	0.532
IHL6	0.705	24.293		
IHL7	0.772	30.739		
IHL8	0.679	24.193		
IHL9	0.754	27.061		
IHL10	0.732	26.516		
Critical health literacy (F3)			0.867	0.623
CHL11	0.747	27.458		
CHL12	0.848	33.805		
CHL13	0.872	35.359		
CHL14	0.674	22.051		
Co-production (F4)			0.880	0.517
COPRO2	0.658	19.687		
COPRO4	0.750	24.940		
COPRO5	0.737	25.874		
COPRO6	0.676	19.883		
COPRO9	0.776	26.655		
COPRO10	0.710	22.837		
COPRO11	0.677	20.589		
Value in use (F5)			0.808	0.460
ViU14	0.582	16.724		
ViU15	0.757	24.981		
ViU16	0.664	20.148		
ViU17	0.738	25.708		
ViU21	0.633	20.462		
S-B χ^2 (289)=956.8609 (p<0.000) BBNNFI=0.925 CFI=0.933 RMSEA=0.052				
Notes: convergent validity is tested with standardized parameters 0.5 or above and its t-values over 1.96 and of each scale and its t-values. Composite reliability is in all cases over 0.7 and AVE values \geq 0.5.				

Table 2. Measurement scales: discriminant validity

Correlation		Std error	95% CI		Correlation		Std error	95% CI	
F1-F2	0.567	0.031	0.505	0.629	F2-F4	0.166	0.041	0.084	0.248
F1-F3	0.494	0.033	0.428	0.560	F2-F5	-0.152	0.044	-0.240	-0.064
F1-F4	0.136	0.040	0.056	0.216	F3-F4	0.109	0.039	0.031	0.187
F1-F5	-0.020	0.043	0.106	0.066	F3-F5	-0.007	0.043	-0.093	0.079
F2-F3	0.702	0.020	0.662	0.742	F4-F5	0.665	0.031	0.603	0.727

Note: CI = confidence interval.

Table 3. Results of structural equation model analyses

Hypotheses	Standardized parameters	Robust t	Test
H1a (+): Functional health literacy → Co-production	0.065	1.401	Not supported
H1b (+): Functional health literacy → Value in use	0.072	1.443	Not supported
H2a (+): Interactive health literacy → Co-production	0.141	2.067	Supported
H2b (+): Interactive health literacy → Value in use	-0.309	-4.247	Not supported
H3a (+): Critical health literacy → Co-production	-0.024	-0.386	Not supported
H3b (+): Critical health literacy → Value in use	0.174	2.620	Supported

χ^2 S-B (129) = 257.9029 (p < 0.000) BBNNFI= 0.909 CFI= 0.923 GFI= 0.840 RMSEA

Firstly, this work analyzes the relationship between the dimensions of the companion's health literacy and the dimensions of the companion's co-creation of value. In previous works, both in the health sector (Virlée, Hammedi, & van Riel, 2020) and in the context of other services (Mende & van Doorn, 2015), the positive relationship between literacy and the co-creation of value has been shown but the relationship between the different dimensions has not been analyzed. The results obtained from a sample of 907 companions of chronically-ill elderly patients show that the positive relationship between literacy and the co-creation of value is only observed for the interactive dimension and for the critical dimension of companion health literacy. This result highlights the interest of identifying the different domains of companion health literacy and co-creation of value.

Secondly, the data of the sample suggests that functional health literacy of the companion is not related to the co-creation of value, neither in terms of co-production with the doctor nor in value in use. The comprehension of the information provided by the doctor, including the terms related to the illness of the patient, does not lead to the companions recognizing that they collaborate with doctors. These results are consistent with the patient studies that have reported

that interventions aimed at improving functional literacy were less efficient than those which developed interactive health literacy (Zegers et al., 2020).

Thirdly, with regard to interactive literacy, this study reveals that the greater the interactive literacy, the greater the increase of the companion's co-production and decrease of value in use. It is clear that communicative skills predispose the companions to collaborate with the doctor, carrying out actions which the doctor proposes and promotes, but which do not contribute to the companions taking the initiative during the consultation. This result is in line with studies which report that some patients do not wish to participate proactively in the health services due to the complexity and peculiarities of these services (Berry & Bendapudi, 2007). The training programs aimed at improving the companion's interactive literacy should involve both parties: the companion and the doctor. Doctors receive training in communication skills in their professional career, and in order to take advantage of said training, it is also necessary to train companions in skills that permit the rapid and easy exchange of information and shared understanding.

Regarding critical literacy, it is found to have no significant effect on the co-production of the companion, but does have a significant and positive effect on value in use. Thus, increasing skills in the critical analysis of information would not appear to contribute to companions recognizing themselves as co-producers of the service, but is associated with positive experiences of the co-creation of value with the healthcare professional, derived from personalized treatment and a close relationship.

Fourthly, this work responds to the call to analyze the co-creation of value from the perspective of the nonreferent beneficiaries (Kelleher et al., 2020). The referent beneficiary is the recipient of the service (patient) and has been the predominant perspective in the research on the co-creation of value (Leroi-Werelds, 2019; Seppänen et al., 2017). The co-creation of value of nonreferent beneficiaries is important and the emerging literature highlights that it is crucial in situations of vulnerability. Every consumer/person may experience vulnerability and at different times, as vulnerability may be temporary (for example, when a consumer lacks resources and does not receive fair treatment in the provision of the service) or permanent (for instance, a lifelong disability). The final contribution of this study is to investigate the co-creation of value of the companion of chronically-ill elderly patients. Supporting the co-creation of value contributes to emphasize the role of the companion in the care of the patient, often scarcely recognized or considered an invisible worker.

Previous studies highlight the need for consultation models which include the companion (Kausar, Ambreen, & Andrades, 2013) and this study offers very interesting and encouraging results aimed at supporting collaboration between companions and doctors. In order for companions to perceive that they co-create value with the doctor, it is not necessary that they possess critical medical information skills (critical literacy), but developing these skills contributes to companions perceiving positive experiences of personalization and empathy during the consultation.

Finally, regarding the limitations of this work, it is a transversal study which evaluates health literacy and the co-creation of value of the companion by means of self-informed measurements. Longitudinal and experimental studies and the inclusion of psychosocial factors are needed to confirm causal effects. The literature shows that the patients' motivation to involve themselves with health services is influenced both by personal characteristics and circumstances, and also by the opportunities to participate that health professionals can offer patients. In addition, it would be interesting to extend the study to other demographic groups, for example, paid companions (or non-family members) and also nursing healthcare professionals who usually carry out advanced care for chronically-ill elderly patients and act as a bridge with other health services.

In future works it would also be interesting to carry out this research with data that reflect the experience of the companion in online consultations. The COVID-19 outbreak has obliged to reduce consultations and limit the companion's physical presence in said consultations. In the context of online consultations, companions have often played a decisive role in facilitating doctor-patient communication and in them, the companion can make up for the lack of physical and visual contact through health literacy (functional, interactive and critical) that favors the co-creation of value. It would also be appropriate to examine if the companion's co-creation of value positively associates with the patient's well-being.

APPENDIX: MEASUREMENT SCALES EMPLOYED

FUNCTIONAL LITERACY. Adapted from: Heijmans et al (2015)

- The letters are too small to read even with glasses on.
 - There are words or signs that I don't understand.
 - The contents as a whole are difficult to understand.
 - I need a long time to understand the content.
 - I need the help of others to understand the content.
-

INTERACTIVE LITERACY. Adapted from: Heijmans et al (2015)

- Search for information on the disease through different sources (for example, Internet, encyclopedias, friends or relatives, associations).
 - Find exactly the information being searched for.
 - Interchange that information with other people (for example, relatives, friends or health professionals).
 - Understand the information found.
 - Use the information to help your relative in their daily life.
-

CRITICAL LITERACY. Adapted from: Heijmans et al (2015)

- Evaluate if the information found is applicable to your relative's case.
 - Judge if the information found is trustworthy.
 - Check if the information found is correct (is error-free) and trustworthy (it inspires confidence).
 - Use the information to take decisions that affect the health of your relative (for example, which affect their medication or the activities that they normally undertake).
-

CO-PRODUCTION. Adapted from: Chathoth *et al.* (2013); Chen *et al.* (2011); Etgar (2008); Hunt *et al.* (2012); Parry *et al.* (2012); Rajan and Read (2016)

- The doctor provides me with sufficient information to understand my relative's illness.
 - The doctor creates a pleasant environment that allows me to present my ideas and suggestions in relation to the illness of my relative.
 - The doctor can easily know my preferences with regard to the healthcare my relative needs.
 - The doctor's manner of proceeding is in line with what I consider to be correct.
 - During the doctor's appointment I can easily express my requests related to the healthcare that my relative needs.
 - The doctor tends to give the companions relevant information regarding the illnesses of the relatives they accompany.
 - The doctor permits the participation of the companions during the course of the appointment.
-

VALUE IN USE. Adapted from: Heinonen and Strandvik (2009); Lemke *et al.* (2011); Macdonald *et al.* (2011); Merz *et al.* (2009); Moeller (2008); Rajan and Read (2016)

- My own participation during the doctor's appointment could make my experience as a companion different to that of other companions.
-

The doctor is open to introducing changes to the healthcare that the patients need following suggestions of the patients' companions.

The usefulness of the doctor's appointment depends on the participation of the patient's companion.

During the appointment the doctor adapts to the specific needs of each companion.

Nowadays I have a good relationship with the doctor I accompany my relative to.

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