Heterogeneity in Preferences for Primary Care Consultations: Results from a Discrete Choice Experiment

Alessandro Mengoni[1], Chiara Seghieri[2,*] and Sabina Nuti[2]

[1]*Azienda Sanitaria Unica Regionale, Ancona, Italy*

[2]*Laboratorio Management e Sanità, Istituto di Management, Scuola Superiore Sant'Anna, Pisa, Italy*

Abstract: *Purpose*: The increasing importance of flexibility in the general practitioner (GP) -patient consultation approach in primary care requires healthcare managers and physicians to find a balance among all the potentially important characteristics of consultation. This study used a discrete choice experiment (DCE) to assess patients' preferences for different attributes of GP consultation and how the rate at which they traded between different attributes is affected by socio-demographic characteristics and past experiences with primary care services .

Methods: A survey was conducted to a sample of 6970 residents in Tuscany region, Italy. Besides socio-demographic characteristics the survey collected information about participants' past experience with GP consultation in the last 12 months. Moreover, participants were asked to select their preferred option in a series of pairwise choices, defined by the following attributes: level of involvement in decision making, amount of information received from the GP and waiting time for the visit.

Results: Results revealed that receiving information from the GP was more important than being involved in the decisions and that, approximately, a complete involvement had the same importance as a partial involvement. Participants' past experience with GP's consultation appeared to have the greatest influence on the involvement level. The amount of information required by the respondents was also influenced by a complex interplay of personal and contextual factors.

Conclusions: This large-scale study extends the body of literature on DCE applications for different GP consultation approaches, providing new information about the influence that patients' socio-demographic characteristics and past experiences could have on consultation preferences.

Keywords: Physician-patient relations, primary care, public preference elicitation, patient-centred care, discrete choice experiment.

INTRODUCTION

In Western countries, the physician-patient interaction has evolved from being a paternalistic one to a patient-centred one. This trend is particularly advocated in the primary care, considering the lack of complex diagnostic and therapeutic technologies and the long term nature of the doctor-patient relationship in this setting.

Although existing research emphasizes support for increasing patient-centeredness in consultations, empirical evidence for the role of patient-centred care in patient outcomes is mixed [1]. While such interventions are generally successful in modifying styles of communication and increasing rates of patient satisfaction, it is much less clear as to whether they result in positive health outcomes [2]. Also in health economics, where the doctor-patient relationship has been modelled within the economic theory of "agency" [3], some of the theoretical arguments implicitly assume a patient-centred approach, while others imply a more paternalistic consultation style [4-6]. All the aforementioned indications suggest that patient preferences should be a more central element in determining the type of consultation approach [7].

However, addressing patients expectations could be arduous, as there are various consultation characteristics potentially important for patients that often generate conflicting results in the doctor-patient interaction. Patients, for instance, want fast access to good care, as well as to be helped to help themselves [8]. On the other hand, time constraints was the most often reported barrier to implementing shared decision making in clinical practice, according to the perceptions of health professionals [9]. This implied an increasing interest in priority setting analyses, where patients are required to trade off between some important attributes. Discrete choice experiments in primary care have presented a quite comprehensive evaluation of patients' priorities for characteristics of primary care consultations [4, 10-12]. DCEs are a commonly used technique in health economics [13] in which individuals are presented with alternative hypothetical services consisting of a number of attributes with different levels, and they are asked to choose between these attributes. However, the existing work has not

*Address correspondence to this author at the Laboratorio Management e Sanità, Istituto di Management, Scuola Superiore Sant'Anna Piazza Martiri della libertà, 33, 56127 – Pisa, Italy; Tel: +39-050-883992;
Fax: +39-050-883936; E-mail: c.seghieri@sssup.it

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accounted enough for the influence that patients' socio-demographic characteristics and past experiences could have on primary care consultations' preferences. Previous studies on primary care demonstrated that such characteristics had an impact on patients' preference for information exchange and involvement in decision making [14] and that the fit between physicians' style and patients' orientation influenced patient satisfaction and trust [15]. In addition, Charles and Gafni [16], rather than advocating a particular approach to patient care, emphasized the importance of flexibility in the decision making process so that individual differences in patient preferences are respected.

Trying to deepen the knowledge on this matter, in this study a DCE approach was applied to Tuscany region (Italy) data to answer to the following research questions:

What characteristics of primary care models are more important to Tuscan citizens?

Are population preferences for different GP consultations affected by socio-demographic characteristics and past experiences with primary care services?

The relative importance of the different primary care model attributes and the rate at which individuals trade between attributes and the relative value of different service configurations was examined by means of a DCE. These results could be of support to healthcare managers to configure existing and new primary care services in order to better meet population needs.

METHODS

Questionnaire Design

The attributes and levels describing the different consultation scenarios were identified through a review of the existing literature and semi-structured interviews to primary care managers and District managers of Tuscan Local Health Authorities and they were validated in a focus group. In order to avoid placing a significant cognitive burden on respondents that could alter the trade off between the attributes [17], the number of attributes selected was limited to the three most important factors emerged [17]. Considering also the results of previous DCEs [4, 10-12, 20], plausible levels to each of the attributes were assigned (Table **1**) [18, 19]. A full factorial design has been adopted [21] and 3^3 (27) combinations were obtained. The 27 alternatives were paired into choice sets using systematic level changes [22] to maintain orthogonality, level balance and minimal overlap [23]. Two different sets of questions were tested, including 10 and 4 choice tasks respectively, using a blocked design. The 27 choice sets were therefore distributed across three blocks of nine and nine blocks of three respectively, creating an extra column with a number of levels equal to the number of blocks which is uncorrelated with every attribute of every alternative. Level balance was satisfied within each block. In each version the sequence of questions was randomized (as to avoid possible ordering effects) with the first choice set repeated as the last choice set (to provide a check of response consistency).

This experiment was embedded in the patient satisfaction and experience survey on primary care services (SEPC) performed in the Tuscany Region in 2009. Full details of the survey are reported elsewhere [24]. The 2009 SEPC questionnaire comprised four sections. The first section regarded participants' past experience with primary care services. In more detail, this section, included questions such as the frequency and reason to see the GP in the last year, the working organization of the GP and the time waited in the clinic in the last consultation in the 12 months before the survey. The second section presented the attributes selected for the DCE and required each respondent to rank them in order of importance, for the identification of apparent non-traders. In the third participants were asked to make their choices in the context of a consultation for a non-urgent problem, and to express their preference for each choice set presented selecting one of the unlabelled options A or B. The fourth section comprised questions on current health status, presence of any chronic condition and socio-demographics.

The survey was carried out using a computer aided telephone interview approach, as it allowed a wide geographic coverage with higher response rates than postal or internet approaches [25] and it was considered a viable method if used with a small number of choice sets per respondent [26].

Recruitment and Data Collection

The reference population of the study consisted of Tuscan residents over 18 years of age. Taking into account the number of interviews required to return statistically significant results at health district level in SEPC survey, on the basis of previous experience and

Table 1: Attributes and Levels Selected

Attributes	Levels	Names
Waiting time for the visit (WAIT)	0 Minutes	Waiting time
	90 Minutes	
	180 Minutes	
Involvement in decision making (INVOLV)	Complete (you choose considering the doctor's opinion)	Completely involv
	Partial (you and the doctor make a joint decision)	Partially involv
	No (the doctor chooses for you) *	No involv
Amount of information (INFO)	A lot of information	A lot of info
	Some information	Some info
	A little information *	No info

*Denotes the base category.

the expected response rates, a sample of 6970 individuals was generated from the telephone directory of the Tuscany Region using a random sampling approach stratified by health districts.

The questionnaires were pre-piloted to a sample of 34 individuals of different age and geographical location. In the final questionnaire configuration each respondent was randomly assigned to one of the nine blocks and was presented with four discrete choices. Figure **1** shows an example of a choice task.

The DCE Models

Each choice of the participants between pairs was included in the model as the binary dependent variable. Choice data were modeled using a random utility maximization framework [27] and, in order to account for multiple observations from a single respondent, a random effect probit model was used for modelling [28]. The baseline empirical model (model 1) was initially specified considering as the only independent variables the differences between the levels of each attribute in each pair of scenarios. Independent variables were effects-coded [29].

As second step, in addition to analysing the main attributes specified in the baseline model, it was hypothesised that respondents' characteristics, such as socio-demographic, health condition and their past experience with the GP, would also influence preferences for consultation. Given that these characteristics do not differ between each choice, they were entered into the model analysis through interactions with the main effects (model 2). To create a more parsimonious model, model 2 was then

Imagine that you need a visit by a general practicioner for a non-urgent problem and that you can choose between two alternatives

Would you prefer

ALTERNATIVE 1	ALTERNATIVE 2
Wait ….	Wait ….
Nothing	*1,5 Hours*
to be visited by a GP that ….	to be visited by a GP that ….
does not involve you in the decisions (the doctor chooses the treatment for you)	*partially involves you in the decisions (you and the doctor make a joint decision about your treatment)*
and that ….	and that ….
gives you some information on your problem / treatment (e.g. the most important information about drugs utilization)	*gives you a lot of information on your problem / treatment (e.g. how to benefit from specific healthcare services that could offer a better treatment or how to improve the quality of you life)*

Figure 1: Illustration of a choice task.

Table 2: Respondents' Description

Attributes	Levels	Names	Freq.	%
Age group	18-49 years	Age 18-49	938	29.5
	50-69 years	Age 50-69	1377	43.3
	> 69 years *	Age > 69	868	27.3
Gender	Female	Female	2419	75.0
	Male *	Male	805	25.0
Education	None / Primary level	Educ No	1066	34.0
	Secondary level	Educ Sec	1759	56.1
	University degree or higher *	Educ Uni	308	9.8
Employment status	Not working / Retired	Empl No	1444	46.2
	Working (High-skilled jobs)	Empl High	293	9.4
	Working (Medium / low-skilled jobs) + Students *	Empl Low	1391	44.5
Income	High	Inc High	1214	42.1
	Medium	Inc Med	1199	41.6
	Low *	Inc Low	472	16.4
Living alone	Yes	Alone	364	11.8
	No *	Alone No	2733	88.2
Health status	Fair / Poor	Health Low	414	13.3
	Excellent / Very good / Good *	Health High	2697	86.7
Chronic disease	Yes	Chron	1132	36.1
	No *	Chron No	2008	63.9
Frequency to the GP clinic in the last year	Never / From 1 to 3 times	Freq Low	903	31.7
	More than 3 times *	Freq High	1950	68.3
Reason to see the GP	General health check / Minor illness treatment	Reas Min	434	16.0
	Already existing illness check	Reas Exist	579	21.4
	Prescriptions / Certificates / Other *	Reas Other	1692	62.6
The GP works with other GPs	Yes	Assoc	757	28.0
	No *	Assoc No	1948	72.0
Time you waited in the clinic	Less than 1 hour	Wait Less	1992	78.0
	More than 1 hour *	Wait More	563	22.0
You have had to put off seeing the GP	Yes (Waited too much, GP unavailable, Clinic closed)	Putoff	243	9.0
	No *	Putoff No	2462	91.0
The GP listened to you carefully	Yes	Listen	2651	98.2
	No *	Listen No	49	1.8
The GP gave you enough time to discuss	Yes	Entime	2649	98.1
	No *	Entime No	52	1.9
The GP involved you in the decisions	Yes	Involv	2627	97.3
	No *	Involv No	73	2.7
The GP gave you clear explanations	Yes	Clear	2649	98.1
	No *	Clear No	52	1.9
The GP gave you advices	Yes	Advice	1881	69.9
	No *	Advice No	810	30.1
You trust in your GP	Yes	Trust	2661	98.4
	No *	Trust No	44	1.6

*Denotes the base category.

reduced stepwise by excluding insignificant interaction effects one at a time with a p-value > 0.10 (model 3).

The 95% confidence intervals (95% CIs) for the predicted utilities were calculated using non-parametric bootstrapping [30] with 2000 iterations. All statistical analyses were performed using Stata 10 (StataCorp, College Station, Texas).

Internal Validity Investigation

To measure internal validity the following three approaches were used: (a) consistency of preferences, which was tested with a stability (or completeness) test (b) willingness to trade which was tested by identifying respondents with dominant preferences following the approach in Scott *et al*. [31], and (c) consistency with theoretical predictions which was explored by examining the sign and significance of parameter estimates.

RESULTS

Response Patterns and Characteristics of Respondents

Of the 6970 persons contacted, 3367 participated to the SEPC survey. Of these participants, 3225 completed the DCE, with a response rate of 46% - comparable to other DCEs in this setting (between 18% and 76%) [10, 24, 32, 33]. Details on responders' characteristics are presented in Table **2**. The respondents were equally distributed and without any significant differences in socio-demographic characteristics and past experience with the GP across the nine versions of the questionnaire used.

Validity Issues

The stability test showed that overall, 10% of respondents were inconsistent, which was considered to be acceptable. These levels are similar to those found in other studies [34-36]. While, for what concerns the willingness to trade, the level of dominant preferences was similar to other studies [31], as 17% of respondents chose always the scenario with the best level of a given attribute that they ranked as the most important attribute in the simple ranking.

DCE Models

The serial correlation obtained from running the random effect models were closed to zero and not statistically significant. This suggested that respondents treated the decision made in each pair-wise comparison as a separate hypothetical situation, and not in association with the decision made in each of the remaining pair-wise comparisons. Thus, all models were re-fitted to the data using the standard probit estimator.

Results from model 1 showed that a large and a moderate amount of information from the GP is more important than being completely involved in the decisions and that participants would be willing to wait up to 92 minutes to be partially involved in the decisions (Table **3**).

Table 3: Results from DCE: Basic Mode (Model 1)

Attribute	Coefficient		Std. Err.	MRS (Min.)	95% CI (Lower)	95% CI (Upper)
Constant	0.193	***	0.016	-	-	-
Waiting time	-0.003	***	0.000	-	-	-
Completely involv	0.235	***	0.014	93.4	79.4	109.6
Partially involv	0.233	***	0.015	92.5	78.8	108.5
A lot of info	0.735	***	0.015	292.3	263.9	328.5
Some info	0.289	***	0.014	114.7	99.7	133.0
N	19212					
Log Likelihood	-10071.73					
Likelihood ratio test (c^2, d.f.)[a]	6490.03 (5) ***					
Pseudo R^2 McFadden[a]	0.244					

****p* < 0.001.
[a]Compared to a only constant model.

Main findings from model 3 (Table **4**) showed that individuals who trust their own GP, who in the last visit have been listened to carefully by the GP and received advice on eating or physical activity, as well as chronic patients did not prefer a consultation with a GP that totally involves them in the decisions about their treatment. Moreover, a GP consultation with a partial involvement was likely to be preferred by respondents living alone, who probably completely trust in their doctor and give him/her more decision power than those living with their family. Respondents who have been involved in the decisions in their last consultation with the GP were instead more likely to value being totally involved in the decisions about their treatment. With reference to the impact of respondents' characteristics on preferences for the amount of information received, a consultation with a GP who gives a lot of information on the problem and treatment was the option preferred by the chronics, by respondents whose GP works in association with other GPs, by those who received in their last consultation advice from the GP on eating or physical activity and by those who trust their GP. Significant interactions between the amount of information and education level, and between information and frequency of visits to the GP clinic in the last year were reported in a similar analysis [4].

Table 4: Results from DCE: Reduced Model with Interaction Term (Model 3)

Attribute	Coefficient		Std. Err.
Constant	0.1766	***	0.019
Waiting time	-0.0024	***	0.000
Completely involv	0.2726	***	0.076
Partially involv	0.2614	***	0.075
A lot of info	0.7297	***	0.061
Some info	0.2878	***	0.019
Waiting time * Advice	0.0003	**	0.000
Completely involv * Chron	-0.0409	**	0.015
Completely involv * Listen	-0.1384	†	0.076
Completely involv * Involv	0.2140	**	0.069
Completely involv * Advice	-0.0357	*	0.016
Completely involv * Trust	-0.1212	†	0.073
Partially involv * Female	-0.0297	†	0.017
Partially involv * Alone	0.0921	***	0.024
Partially involv * Involv	-0.1540	**	0.059
Partially involv *Trust	0.2024	**	0.071
A lot of info * Chron	0.0565	***	0.016
A lot of info * Assoc	0.0924	***	0.017
A lot of info * Putoff	0.1225	***	0.028
A lot of info * Advice	0.1941	***	0.019
A lot of info * Trust	0.1441	*	0.058
Some info * Inc Med	0.0635	**	0.020
Some info * Advice	-0.1708	***	0.018
N	14344		
Log Likelihood	-7396.96		
Likelihood ratio test (c^2, d.f.)[a]	5091.08 (22) ***		
Pseudo R^2 McFadden[a]	0.256		

*** $p < 0.001$, ** $0.01 > p \geq 0.001$, * $0.05 > p \geq 0.01$, † $0.1 > p \geq 0.05$.
[a]Compared to a only constant model.

DISCUSSION

This large-scale study extends the body of literature on DCE applications for different GP consultation approaches, providing new information about the influence that selected patients' characteristics and past experiences could have on consultation preferences.

While the results confirmed the value of all the attributes that were identified, in line with other researches [4, 10, 38-41], receiving information from the GP was more important than being involved in the decisions and that, approximately, a complete involvement had the same importance as a partial involvement.

Apart from the important impact of some socio-demographic variables and the health status, the characteristics connected to the participants' past experiences seem to have the greatest influence on the involvement level. Thus, our data suggest that preferences for a different involvement level could be relatively controllable by the caregivers, considering that, to a large extent, they seem to depend on the attitude of the GP in the previous visits and to the long-term 'personal' relationship between a patient and his/her GP, that is different from the occasional contacts with a specialist. Patients, in Italy, are in fact free to choose their GP at the age of 18 and once they make their final choice they hardly change it [37]. Consequently, this long term relationship, built over the years and most of the times based on reciprocal trust should not require patients' total involvement during each consultation. The presence of heterogeneity was also confirmed when taking into account information preferences.

Implications for Practice

Given this diversity of patient preferences, according to some authors [38, 42, 43] a potentially beneficial strategy to patients would be that of matching the physician's actual behaviour to the patients' desired levels of information and involvement. Ideally, physicians should adapt their participatory style, impersonating easily the entire range of egalitarian to paternalistic role behaviours [44]. However, this solution is not easily viable, because physicians sometimes have difficulties in judging accurately patient expectations [45, 46] and attempting to change provider consultation behaviours is hard to sustain [47].

Thus, further strategies should be used, such as pre-consultation approaches (routine pre-visit assessments of patients preferences and behaviours [7, 48, 49], patient activation programs that train patients to disclose their preferences and to be actively involved in their consultations [50, 51] or tailored interventions with interactive computer based presentations providing detailed descriptions about the disease, the treatment alternatives and the potential outcomes [52].

While there are several ways to achieve successful preference-match interventions, it is also important to note that patients' preferences could change as the patient–provider relationship proceeds [40, 53]. In any case, the physicians could assess patient preferences during the visit by directly asking patients [54], although patients are often unable or unwilling to express their desired roles and needs, and time restrictions may hamper the ability of the physician to elicit valid preferences [55].

Further research therefore is needed to reveal principally how patients' preferences and needs change over time. Clarifying these issues could facilitate the implementation of potentially more appropriate preference match strategies, enabling physicians to deliver a more flexible care with respect to the patient's varying requests for information-receiving and involvement and to consequently improve patient outcomes.

Limitations

The study does have a number of limitations, reflecting the explorative nature of the research. First, although all the characteristics in the experiment were considered important and statistically significant, the relatively small number of attributes used in the design to ensure that the task was manageable for respondents, may have led to the omission of other features probably captured within the constant term. However, there is little discussion on this in the health economics literature, and where a significant constant is identified, the problem tends to be ignored [56].

Second, although our response rate was acceptable, the sample contained a slightly larger proportion of older persons and women than in the Tuscan population at large. This result may be expected in an "in-home" interview survey of this type [57]. In future studies, the potential for such biases needs to be addressed through more resources spent on recruitment of subjects.

Third, the incorporation into the model of several aspects of respondents' characteristics, interacted with

the attributes, consented the investigation of important features of preference heterogeneity. However, some variations in tastes will probably remain unknown to the extent that it cannot be related to observed characteristics. Estimation models such as mixed logit and latent class model, that relax the assumption of taste homogeneity by allowing for random taste variation, should be explored in the future.

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CONFLICT OF INTEREST

All the authors have no conflicts of interest.

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