Health Service Research

Patient preferences for preventive health checks in Danish general practice: a discrete choice experiment among patients at high risk of noncommunicable diseases

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Abstract

Background: Preventive health checks targeted at the at-risk population can be a way of preventing noncommunicable diseases. However, evidence on patient preferences for preventive health checks is limited, especially among patients with a high risk of noncommunicable diseases.

Objective: To examine patient preferences for preventive health checks in Danish general practice, targeting persons at high risk of a noncommunicable disease.

Methods: The method used in this study was a discrete choice experiment (DCE) with five attributes: assess, advice, agree, assist and arrange. The attributes were inspired by the 5A model for behaviour change counselling but was altered for the purpose of this study to grasp the entirety of the general practice-based intervention. Moreover, the attribute levels were defined to resemble daily clinical practice. The experimental design of the DCE was an efficient Bayesian main effects design and the results were analysed using a random utility theory framework.

Results: A total of 148 patients completed the DCE. Patients at high risk of a noncommunicable disease have positive preferences for: giving brief explanations about own lifestyle, practicing shared decision-making with the general practitioner (GP), follow-up counselling with the GP after the preventive health check and scheduling a new appointment right after the preventive health check.

Conclusions: The results provide Danish GPs with evidence on their patients’ preferences towards preventive health checks which will enable the GPs to tailor these consultations. Moreover, the results suggest that pre-appointment measures, such as a health profile, may mediate a preference for more action-oriented attributes.

Trial registration: Registered at Clinical Trial Gov (Unique Protocol ID: TOFpilot2016, https://clinicaltrials.gov/ct2/show/NCT02797392?term=TOFpilot2016&rank=1). Prospectively registered on the 29th of April 2016.

Key words: Chronic disease, doctor–patient relationship, lifestyle modification/health behaviour change, prevention, primary care, risk assessment
Key Messages

- A discrete choice experiment may identify preferences for health checks.
- Pre-session events may mediate a preference for action-oriented attributes.
- General practitioners can use these results to tailor health checks.

Introduction

The burden of disease from noncommunicable diseases is high and continues to increase (1). Despite the disputed evidence regarding health checks in general (2,3), preventive health checks targeted at the at-risk population are still suggested as a way to prevent noncommunicable diseases (4–6). However, the time allocated for preventive health checks and other clinical encounters in primary care is sparse (7). Therefore, the limited time should be utilized in such a way that the patient gains the most from their clinical encounter. Accordingly, assessments of patient preferences for preventive health checks may be one approach to improve the effectiveness of these encounters (8,9).

A systematic review of patient preferences to primary care published between 2006 and 2015, identified 31 different attributes relating to: the organization of primary care (n = 18), the consultation process (n = 10) and patient-related outcomes (n = 3) (10). Moreover, the review suggested that the attributes related to the consultation process, if included, are often the ones most important to the patient (10). In an assessment of patient preferences for consultations with their general practitioner (GP), Pedersen et al. found that being asked about their general health state and lifestyle was the most important aspect of the consultation (11). This indicates positive preferences towards preventive health checks among patients in general. However, the evidence on patient preferences for preventive health checks is limited, especially among patients with a high risk of developing a noncommunicable disease.

Methods

Study design and setting

In this study, a discrete choice experiment (DCE) was used to examine patient preferences for preventive health checks, targeted at persons at high risk of developing a noncommunicable disease. In 2016, we set out to test the feasibility of a novel model for a step-wise approach to targeted prevention programs in the Danish primary care sector. This study was conducted as a large-scale non-randomized pilot study and included 8816 patients, aged 29–60 years, randomly selected from 18 GP clinics and has been described in detail in a study protocol article (12). All patients were invited to complete a web-based questionnaire and receive a personal digital health profile. Three validated risk algorithms (Danish Diabetes Risk Score, COPD-PS and HeartScore BMI-score) were used to identify patients at high risk of type-2 diabetes, cardiovascular disease or chronic obstructive pulmonary disease (13–15). Patients identified as at high risk were offered a preventive health check from their GP, which consisted of a clinical examination, followed by behaviour change counselling. If deemed relevant, the patient also received a follow-up appointment with their GP, at a Municipal Health Centre (MHC) or both, depending on the outcome of the examination and counselling.

Participants

From a total of 2661 participants, 582 (22%) were identified as patients at high risk by the risk algorithms and were advised to get an appointment with their GP for a preventive health check (16). Those 582 high-risk patients were asked to complete a web-based questionnaire. Patients born on an even date (n = 268) were hereafter allocated to a version of the questionnaire that contained a DCE on preferences for preventive health checks.

The discrete choice experiment

A DCE is a controlled experiment used to assess preferences; among others, preferences for health outcomes and health care services from several carefully constructed, slightly different case scenarios (8,9,17). Each case scenario contains a number of important characteristics, so-called attributes. Each of the attributes takes one or more levels. As such, the DCE provides insights into the relative importance of the patients’ preferences towards the level of each of the attributes; taking all attributes and their levels into consideration. DCEs have been described as being better at balancing barriers and facilitators than traditional ranking or rating exercises and to produce consistent results, across stated and actual choices; however, DCEs may be difficult for the respondent to comprehend and complete (18,19).

The DCE developed for this particular study on preventive health checks, was inspired by the DCE used by Pedersen et al. to study patient preferences to general consultations with a GP (11). The DCE included five attributes (Table 1) inspired by the 5A model for behaviour change counselling; yet was altered in order to grasp the entirety of the general practice-based intervention and not just the behavior change counselling session (20). Moreover, the attribute levels were defined as to resemble daily clinical practice as much as possible. Four of the five attributes were defined by two levels while the ‘assist’ attribute was defined by four levels, in order to obtain insight into the specifics of the referral pathways of the Danish primary care sector. The DCE was assessed for usability by patients and GPs.

The experimental design of the DCE was a level balanced fractional factorial Bayesian efficient main effects design, that minimized the D-efficiency criterion. Efficient designs deviate from the principle of strict orthogonality, as they aim to minimize the correlation between attribute levels, to ensure as small standard errors as possible in parameter estimates. All main effects were assumed normally distributed with zero means and a SD of one. The design was generated using Ngene software (21). Eight choice sets were created to ensure enough degrees of freedom to estimate all main effects. Each choice set consisted of two hypothetical alternatives and an opt-out alternative (see Supplementary Material 1 for an example of a choice set).

Statistical analysis

We used a random utility theory framework to estimate patients’ utility coefficients, where the true but latent utility for alternative i of patient n can be written as:

$$U_{in} = V_{in} + \varepsilon_{in}$$  \hspace{1cm} (1)
\[ V_{in} = \alpha + \beta_1 \text{assess}_{in} + \beta_2 \text{advise}_{in} + \beta_3 \text{agree}_{in} + \beta_4 \text{assist\_gp}_{in} + \beta_5 \text{assist\_mun}_{in} + \beta_6 \text{assist\_both}_{in} + \beta_7 \text{arrange}_{in} \]  

(2)

We assumed that the error terms are independent and identically distributed extreme value random variables. Hence, a logit model is appropriate. A mixed logit random parameters model can be specified, assuming that the coefficients vary over patients with density \( f(\beta) \). Furthermore, this model also takes the panel structure of the data into account and relaxes the assumption of independence of irrelevant alternatives. The probability of choosing alternative \( i \) for patient \( n \) is given by:

\[ P_{in} = \int \left( \frac{e^{\mu x_{in} + \eta \beta x_{in}}}{\sum_{i=1}^{J} e^{\mu x_{in} + \eta \beta x_{in}}} \right) f(\beta) \, d\beta \]  

(3)

where \( \mu \) is the scale parameter, which is inversely related to the error variance (22).

We used an error component specification, where we specify the ASC as random and decomposing it into mean \( \alpha \) and SD \( \eta \) such that

\[ \alpha_{in} = \beta x_{in} + \eta_n x_{in} \]  

(4)

All other parameters were fixed. Error component models were estimated in Stata (version 15), using the ‘mixlogit’ command with 500 Halton draws (23), with a 5% two-sided significance level. For ease of presentation, we calculated standardized relative importance scores for each attribute level, based on the utility coefficients from the error component model with the most important attribute level set at one (24).

Validation

Respondent representativeness was assessed on age, sex, educational attainment, occupational status and face-to-face contact with their GP during the previous 3 years by linking information on the study sample with information from the nation-wide Danish health and social registries using the unique personal identification number (25,26). The analysis was performed with Stata 15.1 on pseudonymized data using the research access at Statistics Denmark.

Following the DCE, each patient was asked about the perceived difficulty (very difficult, difficult, either/or, easy, very easy) of the choice tasks and their certainty in their choices (very certain, certain, either/or, uncertain, very uncertain), using five-point Likert scale items. Moreover, we asked the patients to choose their preferred attribute level in five separate questions, with the same wording as used in the DCE. Such cross-verification of the results obtained from the DCE may further inform us on the validity of the DCE (see Supplementary Material 2). As a sensitivity check we reran the statistical analysis by (i) excluding very uncertain and uncertain respondents and (ii) excluding respondents who found it very difficult or difficult to provide answers to the DCE exercise.

Results

A total of 148 (55.0%) out of 268 patients completed the questionnaire with the DCE (Table 2). Most of the respondents were between 45 and 60 years of age and were employed or self-employed. When compared with non-respondents, they seemed to be older and more likely in employment. Moreover, males (54.1%) were overrepresented compared with females (45.9%). Educational attainment and attendance at the GP did not differ between responders and non-responders.

Table 3 and Figure 1 show that respondents have statistically significantly positive preferences towards reaching a shared decision, when compared with being told what to do by their GP (agree). Patients also preferred follow-up counselling in general practice (assist\_gp), compared with being left with reaching the target by him or herself. In addition, patients preferred to have a new appointment booked right away (arrange), compared with book an appointment with their GP later, if necessary. On the other hand, there was a negative preference towards giving detailed explanations about lifestyle (assess), compared with only being provided with a brief explanation. Being informed thoroughly about risks and getting specific advice about how to change lifestyle (advise) were not preferred over being generally informed about the risk and given overall advice.

Table 1. The attributes and level of attributes used in the DCE

| Attributes | Levels | Labels in regression models |
|------------|--------|-----------------------------|
| Assess     | (0) I briefly explain about my lifestyle | Reference |
|            | (1) I explain about my lifestyle in detail | Assess |
| Advise     | (0) The GP generally informs me about the risk and provides overall advice about how to change lifestyle | Reference |
|            | (1) The GP thoroughly informs me about the risk and provides specific advice about how to change lifestyle | Advise |
| Agree      | (0) The GP tells me what treatment targets to set and which methods to use | Reference |
|            | (1) We decide together which treatment targets to set and which methods to use | Agree |
| Assist     | (0) The GP leaves it to me to reach my targets | Reference |
|            | (1) The GP offers me follow-up counselling in general practice to help me reach my targets | Assist\_gp |
|            | (2) The GP refers me to a municipal lifestyle facility to help me reach my targets | Assist\_mun |
|            | (3) The GP offers me follow-up counselling in general practice combined with a municipal lifestyle facility to help me reach my targets | Assist\_both |
| Arrange    | (0) The GP asks me to call for a new appointment if necessary | Reference |
|            | (1) We schedule a new appointment right away | Arrange |
about how to change lifestyle. Similarly, the same holds true for being referred to an MHC (assist_mun) or being offered follow-up counselling in general practice combined with a municipal lifestyle facility (assist_both) as compared with having to reach one target solely by oneself. The sign of the opt out coefficient showed that patients preferred to engage in one of the defined consultations rather than opting out. Further, the SD shows that there was preference heterogeneity related to opting out among patients.

### Validation of the results

A total of 52.0% (n = 76) of the respondents found it difficult or very difficult to choose an option in the DCE. Furthermore, 38.8% were uncertain or very uncertain that they had chosen the correct option in the DCE. The results from the 5-item questionnaire mirrored those obtained from the DCE (Supplementary Material 2). The respondents preferred: to briefly explain about their lifestyle, to engage in shared decision-making, to have a new appointment scheduled right away following their behaviour counselling session and to have their GP stay in the loop regarding subsequent behaviour counselling sessions. The sensitivity analyses showed that preference patterns did not change when: (i) very uncertain and uncertain respondents and (ii) respondents who found the DCE exercise very difficult or difficult were excluded from the statistical analysis. Importantly, although the significance of the attribute levels weakened due to lower sample sizes, signs remained the same (Supplementary Material 2).

### Discussion

#### Main results

Patients between 29 and 60 years of age and at high risk of a noncommunicable disease have positive preferences for giving brief explanations about own lifestyle, for practicing shared decision-making with the GP, for follow-up counselling at the GP after the preventive health check and to schedule for a follow-up appointment right after the preventive health check.

#### Interpretation of results

A previous Danish study of patient preferences to general consultations with their GP found that being asked about general health state and lifestyle was valued most by patients (11). Cheraghi-Sohi et al. found that a thorough health examination was the most valuable attribute of primary care consultations in England (27). In addition, Mengoni et al. found the strongest patient preference for a lot of information, over and above being involved in the decision-making (28). Although the results from these studies are not directly comparable to the setting of the present study, they point to different findings than the ones reported here.

A study from the UK showed strong patient preferences to see their own GP compared with a random GP or other health professionals (29). This result resembles the follow-up preference towards own GP found in the present study. However, the preference towards own GP could also relate to the limited knowledge among Danish patients of the quality and content of MHC-based behaviour change counselling services, as these services resulted from the Danish health care reform of 2007 and are as such still rather new to the patients. The preference for being able to influence own treatment targets and the methods to achieve such targets; over being told what targets to set and how to achieve them, have also been reported elsewhere (30,31). In the study by Hjelmgren and Anell, patients were willing to pay the most for having a greater influence in the treatment choices (31). In the study by Whitaker et al., patients were willing to wait 3.5 days to see a GP with good listening skills (30). However, in
the study by Pedersen et al. shared decision-making was valued less than a discussion and explanation of health and lifestyle (11). Also, Pedersen et al. found no preference for follow-up appointments in general GP-based consultations.

Hence, the results of this study seem to suggest that the GP should carry-out preventive health checks with at-risk patients slightly different, than general primary care consultations; in addition, the GP may have to pay greater attention to the more action-oriented attributes of agree, assist and arrange, with a greater focus on shared decision-making and how the consultations are being followed-up.

However, as suggested from an analysis of the actual uptake of preventive health checks in the Early Detection and Prevention pilot study, the results from this study could also point to a possible enabling effect of a personal digital health profile that the patients were provided with prior to the health check (32). The personal digital health profile was informed by behaviour change techniques that have all shown promising results on the patient’s self-efficacy and intention to change behaviour, and may as such have spurred a shift in the patients’ preferences towards the more action-oriented attributes of the preventive health check (33–36).

Clinical relevance and further research

The results of this study provide Danish GPs with evidence on their patients’ preferences towards preventive health checks and enable the GPs to tailor these consultations in ways which promotes health-risk behaviour change. However, further studies that compare GP and patient preferences for preventive health checks, as well as patients’ actual experience of the preventive health checks, are warranted. The results of this study also suggest that pre-appointment measures, such as a health profile, may mediate a preference for more action-oriented attributes. Yet, linking pre-appointment measures such as personal digital health profiles with a shift in patient preferences, needs further scientific scrutiny.

Strengths and limitations

We provided the patients with the DCE before the preventive health check. Yet, we do not know if they actually completed the questionnaire prior to the preventive health check.

We designed the DCE based on a prior study of patient preferences for Danish general GP-based consultations which was well received by the patients (11). We assessed the DCE for usability but did not systematically test the understanding of the attributes included in this study as suggested in the checklist for joint analysis applications in health (37).

Half of the respondents found the DCE difficult or very difficult to answer, and close to 40% were uncertain or very uncertain about the choices they had made. Similar validation questions were asked in a DCE on patient preferences towards personal health records (38). A total of 38% of respondents found the DCE hard or very hard to complete, while 19% indicated that they were uncertain or very uncertain about their choice-set answers. In a DCE on organizational issues in general practice 49% of the respondents found it very difficult or difficult to answer the choice questions (39). Thus, the difficulties and uncertainties seem to relate to the DCE method rather than the topic of investigation. Importantly, the sensitivity check did not change patient preferences.

Due to the limited number of respondents our analyses were restricted to the entire study population. This also means that it is unknown as to whether insignificant attributes, such as advice and assist to take part in primary prevention in the municipality, are due to a lack of preference for the specific attribute or lack of statistical power.

Conclusion

Patients at high risk of a noncommunicable disease have positive preferences for: giving brief explanations about own lifestyle, practicing shared decision-making with the GP, follow-up counselling at the GP after the preventive health check and to schedule a new appointment right after the preventive health check. These results provide Danish GPs with evidence on their patients’ preferences towards preventive health checks, which enable the GPs to tailor these consultations in ways that promote health-risk behaviour change. Moreover, the results of this study suggest that pre-appointment measures, such as a health profile, may mediate a preference for more action-oriented attributes.

Supplementary material

Supplementary material is available at *Family Practice* online.

Declaration

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Ethical approval: the study was approved by the Danish Data Protection Agency (J.nr 2015-57-0008) and prospectively registered at Clinical Trial Gov (Unique Protocol ID: T0Ppilot2016). According to Danish regulations [Act on Research Ethics Review of Health Research Projects (section 14.2)], this study does not need approval from a health research ethics committee, as no research on human tissue or other biological material was performed. The study complies with the Helsinki declaration with informed consent to study participation.

Conflict of interest: none.

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