CHECK'D?! : determinants of participation in a two-stage cardiometabolic screening among underserved groups

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Risk factors detected and follow-up actions conducted among 'hard-to-reach' groups durings the practice consultation of the Prevention consultation: cross-sectional GP record study

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ABSTRACT

Background

The guideline for Dutch GPs *PreventieConsult module Cardiometabool risico (PC)* follows a two-stage approach: (1) an (online) health risk assessment (HRA), (2) additional tests at the general practice for participants with a risk score above the cut-off value. Prerequisites for cost-effectiveness are approaching high-risk groups (lower socioeconomic status (SES) or immigrants) and retaining as many participants as possible in both stages. We investigated in the high-risk patients who went to the GP for additional tests, what risk factors were recorded, and what subsequent actions were undertaken.

Methods

Cross-sectional GP record study in six GP practices in deprived areas of The Hague and surroundings. Between 05-2012 and 12-2013, we invited 1645 patients. Target population: native Dutch with a lower SES, Turkish, Moroccan, and Surinamese (45-70yrs; Hindustani 35-70yrs) with a risk score above the cut-off value (n=208). GP record data were derived from the CVRM-protocol, laboratory data, and GP log.

Results

The number of indicated additional tests conducted was relatively high (71%, n=148), but least so among the native Dutch. Because of incomplete recordings, we could calculate the PC risk score of consultation data for only 3% (n=4) of the participants, which was above the cut-off value for all. We could calculate the CVRM score for 44% (n=66) of the participants, of whom 39% (n=26) fell in the 'yellow'/'red' box of the risk table. Medication was prescribed in 20% (n=29) of the cases: from 5% (n=7) oral antidiabetics to 11% (n=17) statins. Lastly, 69% (n=44) of the smokers received a quit-smoking advice, and 36% (n=53) of the participants received other lifestyle advice.

Discussion

It is possible to reach a participation rate among 'hard-to-reach' groups comparable to or even higher than among the general population. Focus of attention is that the GP should not only record patient data covered by the classic guidelines but also the other risk factors associated with cardiometabolic disease (like family history), and the (lifestyle) advices provided.

Possibly, appropriate compensation will promote adequate recording of data and follow-up actions, especially important for vulnerable groups. The crucial role that the GP plays especially for these groups is all the more important now the PC has been replaced by the *Persoonlijke Gezondheidscheck* [Personal Health Check], implemented more broadly than in primary care.

WHAT IS KNOWN? WHAT IS NEW?

1. The guideline for Dutch GPs, The Prevention Consultation, module Cardiometabolic risk (PC), follows a two-stage approach: (1) (online) risk assessment, (2) additional (lab) tests at the GP for participants with a risk score above the cut-off value (practice consultations).
2. Inequalities in health gains from screening need to be prevented by targeting high-risk groups (low socioeconomic status (SES) or non-Western immigrants) and retaining as many individuals as possible in both stages.
3. By means of a stepwise invitation strategy it is possible to accomplish a practice consultation participation rate of 71% among 'hard-to-reach groups', which is comparable to or even higher than among the general population.
4. Due to incomplete GP consultation recordings we could calculate the PC risk score for a very small percentage of participants only.
5. We could calculate the CVRM score for 44% (n=66) of the participants, of whom 39% (n=26) fell in the 'yellow'/'red' box of the risk table.
6. Medication was prescribed to 20% (n=29) of the participants: from 5% (n=7) oral antidiabetics to 11% (n=17) statins, 69% (n=44) of the smokers received a quit-smoking advice, and 36% (n=53) of the participats received other lifestyle advice.

INTRODUCTION

The guideline for Dutch GPs, The Prevention Consultation, module Cardiometabolic risk, was introduced in 2010, complementing existing guidelines. This guideline described the active and systematic detection of, and the care for, individuals with an increased risk of cardiovascular disease, diabetes type 2, and chronic kidney damage. It focused on so-called indicated prevention (1). Recently, the Prevention Consultation (PC) has been replaced by the Personal Health Check (PHC), which also includes a COPD risk test and the so-called Prevention Compass. Additionally, it incorporates the implementation possibilities beyond primary care (2).

The PC follows a two-stage approach: (1) participants complete the (online) health risk assessment (HRA), (2) individuals with a risk score above the cut-off value receive the advice for additional (lab) tests at the GP's office. Although the separate components are evidence-based, the cost-effectiveness of the whole method still needs to be established. Certain studies conclude that two-stage screening can be cost-effective (3, 4). Screening is particularly useful when it reaches not only the 'worried well' but especially the vulnerable, hard-to-reach groups, who more often have an increased risk. Among others, these groups are the non-Western immigrants and natives with a low socioeconomic status (SES) (5-8). A non-Western descent and a low SES are associated with lower health check attendance (8). This selective attendance results in inequalities in health gains which can potentially be achieved by screening. Additionally, retaining as many participants as possible in both stages of the screening process is of great importance. Previous studies about the PC among the general GP population showed substantial drop-out rates, and these rates are potentially higher among groups already harder to reach (7).

To investigate the yield of the PC among aforementioned vulnerable groups, we conducted the CHECK'D (*Cultural Health check Evaluating Cardiometabolic and Kidney Disease*) study. With this study we aimed to increase the participation rates of hard-to-reach high-risk groups in both stages of the Prevention Consultation by means of a (culturally) adjusted stepwise invitation strategy (9). In this paper we report a substudy within CHECK'D: a GP record study in which we investigated what risk factors were found among participants with a high-risk HRA result, and what follow-up actions were conducted. Our research questions were: 1) What risk factors were recorded by the GP? 2) Among what percentage of the patients did the GP/practice nurse conduct follow-up actions (prescription of medication and providing quit-smoking and other (lifestyle) advices)?

METHODS

Study population and design CHECK'D

This cross-sectional GP record study is part of a larger study called CHECK'D. The CHECK'D study was a pragmatic primary care intervention with a stepwise invitation strategy. Between May 2012 and December 2013, we invited 1645 native Dutch with a low SES and non-Western immigrants (Turks, Moroccans, and Surinamese) for participation in the PC. These patients came from six GP practices in deprived neighbourhoods in The Hague and surroundings. We estimated ethnicity on the basis of last name and this was checked by the participating GPs. The GPs selected the native Dutch with a low SES. This was verified by us on group level with a SES status score based on postal code (10). This SES score is a measure for the social status of a neighbourhood. Participants were between 45-70 years old, except for the Hindustani Surinamese, who were invited from the age of 35 years because of their increased risk of diabetes type II (DMII) from an early age. Exclusion criteria were: known cardiometabolic disease; use of antihypertensives, lipid-lowering drugs, or antidiabetics; or an already completed cardiometabolic risk profile of less than a year old. We deployed a culturally-adapted, personalized, stepwise invitation strategy for participation in the HRA: (1) all patients received a written invitation; (2) non-responding patients were approached by telephone; (3) telephone non-responders were approached by their GP when they attended a (non-related) consultation. Written materials were send both in Dutch as well as in Turkish/Arabic to Turkish/Moroccan patients. Turkish and Moroccan patients were called by Turkish, Arabic, and Berber speaking research assistants. During the first practice consultation, physical measurements (weight, height, and blood pressure) were carried out and a referral for lab tests (fasting glucose and cholesterol levels) was provided. Also, the answers of the HRA were checked with the participants. During the second practice consultation, the results of the lab tests were discussed, the 10-year risk of cardiometabolic diseases was calculated, lifestyle advice was provided, and (if necessary) medication was prescribed. For the ease of interpretation of the results we will refer to the two practice consultations as if it were one consultation. Participation in the study followed an 'opt-out procedure': patients could return a reply card on which they indicated that they did not want to participate. The CHECK'D study was approved by the medical ethical committee of the LUMC (registration number P11.151). The design and the results of the CHECK'D study have been described in detail elsewhere (9).

Study population and design of this study

Of the 1645 individuals invited, 713 completed the HRA, of whom 29% (n=208) had a risk score above the cut-off value: the study population for this paper. After completing the HRA, these high-risk patients received the test result straight away and were adviced to visit their GP for a practice consultation.

The first author (IG) visited the participating GP practices early 2014 and noted how many patients had attended the practice consultations, as well as the GP record data of these alleged high-risk patients. This data came from the CVRM guideline (provided that this was used), lab results, and the log. Noted data were the date of the practice consultation and the relevant cardiometabolic parameters: smoking status, height, weight, waist circumference, family history of cardiovascular diseases (CVD) and/or DMII, blood pressure, cholesterol ratio, fasting glucose, cardiometabolic medications prescribed (antihypertensives, statins, oral antidiabetics), and quit-smoking, and other lifestyle advices provided. We used these data to calculate the percentage of patients of whom the HRA was checked by the GP and the percentage of patients of whom the parameters from the CVRM and DMII guidelines had been recorded. Besides that, IG noted what factors may have played a role in non-attending the practice consultation (e.g. changing GP practice) from the GP records of no-shows.

Data analysis

We investigated differences in (patient) characteristics (ethnicity, age, SES score, and HRA result) between attenders and non-attenders by means of t-tests and ANOVAs. We present the risk factors in frequency tables: both the HRA parameters checked during the practice consultation (1) as well as the recorded data based on the CVRM and DMII guidelines (11, 12). We present the follow-up actions in the form of medication prescribed and advices provided descriptively.

RESULTS

Approximately 2/3 of the high-risk patients (n=208) attended the practice consultation [**Table 1**]. Native Dutch with a low SES attended the practice consultation less often than patients from non-Western descent. In 78% (n=47) of the no-shows, we found no indications in the GP records of possible reasons for their non-attendance. For the other non-attenders, mental

health problems, changing GP practice, mental retardation, not wanting follow-up actions, or a combination of these factors potentially played a role.

Table 1. Characteristics of participants in the practice consultation

	High-risk patients according to the HRA (n=208)		*p* value
	Non-attenders practice consultation (n=60), n (%)	**Attenders practice consultation, (n=148), n (%)**	
Ethnicity			
Native Dutch	37 (62)	45 (30)	
Turkish	9 (15)	47 (32)	**<0.001**[a]
Moroccans	10 (17)	30 (20)	
Surinamese	4 (7)	26 (18)	
Age (years)	Mean: 56 (±7.4)	Mean: 56 (±6.2)	
30-44	2 (3)	0 (0)	
45-49	10 (17)	27 (18)	
50-54	8 (13)	40 (27)	0.078
55-59	17 (28)	34 (23)	
60-64	13 (22)	30 (20)	
65+	10 (17)	17 (11)	
SES score[b]	Mean: -1.3 (±2.1)	Mean: -2.0 (±2.4)	
> 0	20 (33)	46 (31)	
0 tot -2	22 (37)	34 (23)	0.097
-2 tot -4	9 (15)	26 (18)	
< -4	9 (15)	42 (28)	
HRA result[c]	Mean: 40 (±7.3)	Mean: 39 (±6.3)	0.491

[a] Practice consultation attendance was lower among native Dutch than among other ethnicities.
[b] A lower SES score represents a lower social status of a neighbourhood.
[c] A lower HRA result represents a lower estimated risk of cardiovascular disease, diabetes type 2, and chronic kidney damage (range: 0-66).

[**Table 2**] presents the HRA parameters of the patients who attended the practice consultation. These were the answers the patient had filled out in the HRA, which should be checked by the GP. Notable was the large number of non-recorded data: varying from 35% (n=52) missing smoking status data to 87% (n=129) missing waist circumferences. Due to all these missing data, we could calculate the formal PC risk score for 3% (n=4) of the participants only. All four individuals had a risk score above the cut-off value.

Table 2. Parameters needed to calculate the PC risk score (HRA parameters checked during the practice consultation)

	Attenders practice consultation, (n=148), n (%)
Age[a]	
30-45	0 (0)
45-49	23 (16)
50-54	38 (26)
55-59	37 (25)
60-64	31 (21)
65+	16 (11)
Missing	3 (2)
Smoking status[a]	
No smoker	32 (22)
Smoker	64 (43)
Missing	52 (35)
BMI	
Underweight	3 (2)
Healthy weight	14 (9)
Overweight	31 (21)
Obese	30 (20)
Missing	70 (47)
Waist circumference	
Healthy	2 (1)
Unhealthy	17 (11)
Missing	129 (87)
Family history CVD	
No	35 (24)
Yes	19 (13)
Missing	94 (64)
Family history DMII	
No	9 (6)
Yes	26 (18)
Missing	113 (76)
PC risk score	
No increased risk	0 (0)
Slightly increased risk	0 (0)
Increased risk	4 (3)
No conclusion possible	144 (97)

[a] These parameters are also needed for calculating the CVRM risk score (see table 3), but are not listed twice.

[Table 3] presents the parameters based on the GP guidelines CVRM and DMII. Although the missing data was not as notable as for the PC parameters, still many parameters were unknown: varying from 20% (n=29) missing glucose levels to 35% (n=52) missing smoking status data. We were able to calculate the CVRM risk score for almost half of the participants. Of these individuals, approximately two out of five (39%, n=26) had an (slightly) increased

risk ('yellow' or 'red' box in the risk table (11)). Of those patients with a known glucose level, 23% (n=27) had impaired glucose tolerance or diabetes: relevant in the context of the DMII guideline. In part, these were the same patients who fell under the CVRM guideline. Regarding the follow-up actions during the practice consultation: medication was prescribed to 20% (n=29) of all patients. Oral antidiabetics were prescribed to 5% (n=7) of the patients, antihypertensives to 8% (n=12), and statins to 11% (n=17). Of those patients who were recorded by the GP to be a smoker (n=64), 69% received a quit-smoking advice. In total, 36% (n=53) of the patients received a lifestyle advice regarding nutrition or physical activity or a referral to a dietician or a physical activity coach.

Table 3. Parameters needed to calculate the CVRM risk score and needed to classify according to the DMII guideline

	Attenders practice consultation, (n=148), n(%)
Age[a]	
Smoking status[a]	
Systolic blood pressure	
<120 mmHg	22 (15)
120 tot 140 mmHg	51 (34)
140 tot 160 mmHg	23 (16)
160 tot 180 mmHg	11 (7)
≥ 180 mmHg	4 (3)
Missing	37 (25)
Total cholesterol/HDL ratio	
≤ 4	62 (42)
5	24 (16)
6	16 (11)
7	6 (4)
≥ 8	6 (4)
Missing	34 (23)
CVRM risk score	
No increased risk	40 (27)
Slightly increased risk	17 (12)
Increased risk	9 (6)
No conclusion possible	82 (56)
Fasting glucose	
Normal	92 (62)
Impaired	15 (10)
Diabetes	12 (8)
Missing	29 (20)

[a] These parameters are also needed for calculating the PC risk score and are, thus, already listed in table 2.

DISCUSSION

Answer to the research question

Two out of three patients with a HRA score above the cut-off value actually attended the practice consultation. Many of the HRA parameters were not checked by the GP/practice nurse during the practice consultation, or if they were checked they were not recorded, resulting in a lot of missing data. Of the small number of patients of whom all data was known, everyone had a risk score above the cut-off value. Risk factors for which the GP/practice nurse proceeded to follow the classic guidelines were recorded best, even though still approximately a quarter of the data were missing. More than a quarter of all patients fell into the CVRM guideline and also almost a quarter fell into the DMII guideline (in part the same individuals). Medication was prescribed to one out of five participants. Of all patients, 1/3 received lifestyle advice regarding nutrition or physical activity, or a referral to a dietician or physical activity coach. More than 2/3 of the smokers received a quit-smoking advice.

Strengths and weaknesses

Strength is that we set up the logistics of this study completely according to the practice guideline of the PC, which is useful for the PHC as well. We (culturally) adapted the design and accompanying materials to the specific target populations (9). We obtained the required data in different ways from the GP records.

A limitation of the study was that we estimated ethnicity based on last name, since this is not registered in the Netherland. 'Mixed' marriages could have resulted in the incorrect exclusion of non-Western women married to a native Dutch man, and of native Dutch women married to a non-Western man. However, the GPs checked the lists with last names, which makes the likelihood of this bias small.

Even though the GP record study should be a factual reflection of the execution of the practice consultation, we have not obtained insight in what actually has happened during the practice consultation due to the inadequate recordings. We suspect that some components of the PC may have been executed/discussed, but not recorded.

The number of patients provided by the different GP practices varied, in particular because of the varying practice sizes. As a result, possible selection bias cannot be ruled out.

Additionally, the quality of the recordings differed substantially between the GP practices. However, the number of patients and practices were too small to stratify the data. Finally, the

willingness of GPs to participate in the study may have resulted in an overly optimistic picture.

Consequences of the results and results of previous research

Participation in the practice consultation in our study was considerably higher than in the pilot study of Nielen *et al* among the general GP practice population (13). It was comparable to two other studies about the PC in which also about 2/3 attended the practice consultation (14, 15). In the latter two studies high-risk patients were invited for participation in the practice consultation. Both in Nielen's pilot and in our study the patient was responsible for making an appointment. Our results show that it is feasible to achieve a participation rate among 'hard-to-reach' groups that it is comparable to the general population, which also holds for the new PHC. We specifically targeted high-risk groups (native Dutch wit a low SES and non-Western immigrants). Study materials were based on exisiting materials of the Dutch Association of GPs but were further developed for these high-risk groups specifically. The materials are suitable and available for GP practices with a (large) proportion of these high-risk patient populations.

Participation in the practice consultation in our study was also higher than that in the British NHS health check, which was less than 50% there (16, 17). In these studies, patients were risk-stratified beforehand and only high-risk patients were invited. In our study, this risk-stratification took place on the basis of a patient's HRA. As a result, HRA completers with a high-risk result were possibly also more inclined to attend the PC as well.

Our detection rates of patients needing care according to a guideline were higher than what was found in studies among the general population. For example, 8% of our patients were diagnosed with diabetes, whereas in the 3 other Dutch studies this percentage varied from 1-3% (13-15). The number of patients who, after the practice consultation, fell in the 'red' box of the CVRM risk table was 6% in our study, comparable to the 3-6% that was found in other studies (14, 15).

A notable finding is that parameters used within the existing guidelines (CVRM and DMII) had less missing data than the parameters used only within the PC. In part, this may be explained by us entering the HRA results in the GP records. Perhaps GPs thought it unnecessary to verify the data, or they did not record deviations between their measurements and the HRA results.

Another possible explanation is that adequate recording of parameters for the CVRM and DMII guidelines is directly related to the financial reimbursement. In a recent Dutch study Nouwens *et al* showed that cardiovascular risk indicators were monitored better for contracted, and, thus, financed diabetes care than for the (at the time) uncontracted, unfinanced COPD care (18). An additional financial incentive for adequate implementation of the PHC will, most likely, improve the quality of the follow-up care. GPs in the United Kingdom (UK) record lifestyle (advices) better than GPs in other European countries, explained in the literature by the fact that they are financially well rewarded for this within their "Quality and Outcome Framework (19). This study showed that the smoking status of a staggering 97% of patients in the UK was recorded, relative to 65% in our study. A quit-smoking advice was given in 85% of the cases in the UK, whereas in our study this was 69%. Our percentage is even relatively high for Dutch standards: a study among Dutch patients who visited their GP showed that in 56% of the cases the GP had informed about their smoking status and that in 44% of the cases a quit-smoking advice was given (20). Dutch research showed that the lack of scientific evidence and the perceived workload (time invested) are the most important barriers to implementation of the PC, next to the uncertainty about the financial reimbursement (21). An ongoing large-scale study must provide the evidence of the cost-effectiveness of the PC (22). Our study shows that adoption of the PC must be combined with thorough implementation arrangements, for example about recording and follow-up of non-responders.

The British also provided other lifestyle advice (nutrition and/or physical activity) more often than the GPs in our study. Notable in our study was, again, the inadequate recordings: often only 'lifestyle advice given' was noted in the GP records. This makes it impossible to continue the counselling in follow-up consultations. Additionally, an occasional referral to a dietician and/or physical activity coach was noted: whether or not community facilities/interventions were used remained unclear. This is a challenge for the new PHC: making use of the numerous community initiatives and adequate GP recording of (the use of) these initiatives. During our study, no protocol for lifestyle advice existed. As a result, content and responsibilities were unclear. Currently, the Healthcare modules Lifestyle have been published by the Dutch Association of GPs (23). There are Modules available about alcohol, physical activity, smoking, and nutrition. There are also guidelines regarding general aspects of lifestyle advice: self-management, immigrants and low literacy, social map, and collaboration. Especially the second and third are documents that can play an important role in the further implementation of the PC among these groups.

Recommendations

To achieve the goals set for the new PHC the vulnerable groups require special attention, because they are often harder to reach and more often have an increased risk. Our study shows that GPs can play an important role in approaching these high-risk groups (selective prevention). Unfortunately, the active involvement of GPs is no longer an explicit part of the PHC (24). Even though this new design of the PHC facilitates the implementation outside primary care, it may hinder the important role of the GP in approaching high-risk groups.
A second important implication of this study is that GPs need to improve their recording of existing risk factors and lifestyle advices provided, especially when they fall outside the classic guidelines. The current inadequate recording does not only limit scientific research, but definitely also limits adequate guidance and follow-up of patients with existing risk factors. Finally, from the results of this study we can conclude that an active role of GPs in the early detection and follow-up of underserved high-risk groups warrants additional reimbursements.

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