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## Pharmacists' experience of a diabetes risk-assessment service and analytical quality control in community pharmacies – A focus-group study

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## ABSTRACT

**Background:** Healthcare services such as diabetes risk-assessment are increasingly common in community pharmacies. Knowledge of community pharmacists' experiences of such services could ease the implementation of a larger-scale service.

**Objectives:** To explore Norwegian pharmacists' experience of a diabetes risk-assessment service, including analytical quality control, in a community-pharmacy setting.

**Methods:** Three focus-group interviews were conducted in Norway between August and September 2017. Systematic text condensation was used, an analytic approach well suited for thematic content analysis across interview data. Fourteen pharmacists took part, recruited from a project offering a diabetes risk-assessment service, including measurements of Glycated hemoglobin A1c (HbA1c), in Norwegian community pharmacies.

**Results:** The pharmacists emphasized the importance of using their knowledge and skills to promote good health. They considered offering this service as being compatible with their role as pharmacists. As communication is an essential part of their work, the pharmacists evaluated their communication skills as being good. Nevertheless, how to communicate the offering of this service was seen as a challenge, for instance recruiting participants and communicating in an understandable and professional way. Inclusion of the whole pharmacy staff as a team was experienced as an important success factor for implementation of a risk-assessment service. Analytical quality control was perceived as being a natural part of their job and a manageable task.

**Conclusions:** Offering a diabetes risk-assessment service is in line with the way a selected group of Norwegian community pharmacists perceived their professional role. However, they were uncomfortable recruiting participants, and expressed the wish for more support from the pharmacy chain. Our results add performance of analytical quality control as part of the ongoing development involving expansion of pharmacists' professional role. Future implementation studies may also benefit from giving both the pharmacy staff and customers sufficient time to familiarize themselves with the new service before measuring effects.

**Abbreviations:** COREQ, consolidated criteria for reporting qualitative research; EQA, external quality assurance; FG, focus group; FIP, International Pharmaceutical Federation; GP, general practitioner; HbA1c, Glycated Hemoglobin; HIV, Human Immunodeficiency Virus; NCPF, Norwegian Community Pharmacy Foundation; PhD, Doctor of Philosophy; POCT, point-of-care testing; SCT, Systematic Text Condensation; T2D, Type 2 diabetes; UK, United Kingdom; WHO, World Health Organization.

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## Introduction

Worldwide, non-communicable diseases caused 73% of the total deaths in 2017 – a 40% increase on the figure for 1990.<sup>1</sup> This global burden of non-communicable diseases can be reduced by using available healthcare professionals for early detection of those at high risk of diabetes or heart disease. Community pharmacists are described as underutilized health professionals, because of their advanced skills in pharmacotherapy and their easy accessibility within the community.<sup>2</sup> A joint guideline from the International Pharmaceutical Federation (FIP) and the World Health Organization (WHO) thus suggests that pharmacists should be more involved in disease prevention by offering services such as point-of-care testing (POCT) and screening activities for patients at higher risk of disease.<sup>3</sup>

Norway, with a population of 5.3 million, has almost 1000 pharmacies, and the community-pharmacy market is dominated by 3 international chains.<sup>4</sup> About 94% of the population have a pharmacy in their municipality, and Norwegian pharmacies have in total more than 170,000 customers daily.<sup>4</sup> The Norwegian government recommends that healthcare professionals be used more effectively, and that pharmacies carry out new tasks.<sup>5</sup> The Norwegian Pharmacy Association supports this development and recommends that Norwegian community pharmacies offer a variety of health services.<sup>6</sup> Pharmacists are positive to their role as health professionals,<sup>7</sup> and a Norwegian study found that pharmacists wanted more responsibilities, offering person-centered services.<sup>8</sup> In accordance with the Norwegian Pharmacy Association recommendation,<sup>6</sup> new health services have increasingly been offered in Norwegian pharmacies over the past decade. In Norway there are 2 state reimbursed services which are free of charge for the patient: the structured pharmacist-led inhalation-technique assessment, implemented in

2017,<sup>9</sup> and the New Medicine Service (Medisinstart), implemented in 2018.<sup>10</sup> Other community pharmacy services, such as a mole screening service, blood pressure measurements, smoking cessation, and vaccination, are offered more sporadically, and most often require a customer payment. These pharmacy services contribute to the extending professional role of the pharmacist in public health in Norway.

Given the growing prevalence of type 2 diabetes, identifying persons at risk of this disease may be another public health service where the pharmacies could be used. The Norwegian Directorate of Health does not recommend an active screening for T2D in the population, but recommends that general practitioners (GPs) assess the risk of T2D in people who have close relatives with diabetes, people with high body mass index (BMI) and/or who are physically inactive, and in people from Asia or Africa (a non-western background).<sup>11</sup> The patients pay a co-payment of 20–25 EUR for a GP-consultation. As of today, Norwegian pharmacies do not offer diabetes risk assessment service on a regular basis. In 2016 we therefore first performed a feasibility study,<sup>12</sup> investigating a diabetes risk assessment service in Norwegian community pharmacies. Based on results from the feasibility study,<sup>12</sup> we performed a larger study to explore if Norwegian community pharmacies could identify individuals with a high risk of developing T2D by offering a diabetes risk assessment service including a measurement of hemoglobin A1c (HbA1c) (Manuscript under revision). **Box 1** describes the methods of the study. Unfortunately, the participating pharmacies only managed to recruit one tenth of the target number of pharmacy-customers estimated based on the recruitment rate of the feasibility study.<sup>12</sup> The reasons for this were unclear.

While several studies, including reviews, have found that pharmacists' perceptions are shifting towards delivering patient care,<sup>17,18</sup> few studies have explored pharmacists' experiences regarding a diabetes

### Box 1

An overview of the methods in the community pharmacy diabetes risk assessment study (Manuscript under revision).

#### Participating pharmacies:

The regional manager from 1 of the 3 major pharmacy chains in Norway sent an e-mail to all their 350 pharmacies. Twenty agreed to participate. Of these, 11 pharmacies were allocated to the group who offered a HbA1c measurement to customers with a high risk of developing T2D. The pharmacies varied in size (number of customer prescriptions per day varied from 41 to 270), were from all across Norway, and both rural and urban areas were represented.

#### Staff training:

From each pharmacy, 2 pharmacists participated in a training program and were then responsible for providing the service. The participating pharmacists received written procedures for recruitment, diabetes risk assessment and how to counsel the participants with different risk profiles. They attended web-based courses covering internal and external analytical quality control of the HbA1c instrument. In addition, they attended a one-day course day where they were trained, through role playing, in how to convey risk information. They were also given practical training in the use of the HbA1c POC instrument and performing quality control procedures (More details on the quality control program is published<sup>13</sup>).

#### The risk assessment service:

Over 6 months the 11 Norwegian community pharmacies offered a diabetes risk-assessment service and pharmacy customers 45 years or older who wished to participate contacted the pharmacy staff. This free service consisted of a diabetes risk-assessment tool which included questions about risk factors for developing T2D such as age, BMI and family with diabetes.<sup>14,15</sup> Participants with a high risk of developing T2D were offered a HbA1c measurement. All participants received lifestyle recommendations from the Norwegian national guideline for diabetes.<sup>11</sup> After 2 months all participants were followed up with a questionnaire or a phone call. Marketing of the service included leaflets in the participating pharmacies and in nearby pharmacies, as well as posters both inside and outside the pharmacies.<sup>12</sup> In addition, there was some publicity in the radio and regional newspapers, on the pharmacy chain website and Facebook.

#### Quality assurance of HbA1c:

The pharmacies were enrolled in an external quality assessment (EQA) scheme and performed internal quality control (IQC) regularly.<sup>12,13</sup> Participation in the EQA scheme is an objective means of evaluating the reliability of the HbA1c results. The pharmacies analyzed control material distributed by an independent external coordinator.<sup>16</sup> The test results obtained were compared with a target value obtained by a Reference Laboratory, and the performance were evaluated based on predefined limits. The results were evaluated for trueness and precision. IQC implied that the pharmacy analyzed samples from the producer of the HbA1c instrument in 2 levels on all days that a customer HbA1c measurement was performed, and upon opening a new box of reagent. Thus, IQC is a continuously method validation by monitoring the accuracy of analytical data obtained in the pharmacy.

risk-assessment service in a community-pharmacy setting.<sup>19–21</sup> Those that have done so have found factors such as lack of time and shortage of staff to be the main barriers to providing such a service.<sup>19,20</sup> These studies were performed in Australia, Thailand and the United Kingdom (UK),<sup>19,20</sup> and there have been no such studies in the Scandinavian countries. Differences in healthcare systems and pharmacy practice may affect attitudes and implementation of healthcare delivery in a pharmacy setting. It is thus important to explore the factors that may influence pharmacists' experiences regarding diabetes risk-assessment intervention in each country. Furthermore, experiences of analytical quality control among community pharmacists have to our knowledge not been explored. Increased understanding of community pharmacists' experiences with such a service, including the analytical quality control-component, could ease implementation of a generalized service. The aim of this study was thus to explore experiences pharmacists who had participated in delivering a diabetes risk-assessment service in a community-pharmacy setting.

## Methods

### Design of the study

A qualitative study with 3 focus-group interviews was conducted.<sup>22</sup> The consolidated criteria for reporting qualitative research (COREQ) were used.<sup>23</sup>

### Recruitment and participants

All the 22 project pharmacists, 2 from each pharmacy, who participated in a diabetes risk-assessment-service trial in Norwegian community pharmacies (Box 1) (Manuscript under revision,<sup>12</sup>) were invited by email to participate in a focus-group study. Ten of the 11 pharmacies were represented in the focus-group interviews. Four of the pharmacies sent both of their project pharmacists, while 6 pharmacies only sent one. Reasons given for non-attendance were that no suitable stand-in pharmacist was found at the time of the group interview, or that the project pharmacists no longer worked in the pharmacy. The diversity of gender, age, work experience and place of education is shown in Table 1.

### Preparing for the interviews

Three of the authors (ARJ, UØS and RLSK) developed a semi-structured interview guide with main topics and open-ended questions. KS and MR read the guide in advance of the interviews and gave feedback before the final version was settled (Supplementary file 1). The

3 main topics were 1) the pharmacist's experience of implementation of the diabetes risk-assessment service in their pharmacy; 2) the pharmacists' understanding of their role in this project, and 3) their experience of and attitudes to blood-sample analysis in the pharmacies. The majority of the questions were the same in each interview, while the follow-up questions varied, as the focus group moderator followed the flow of the group discussion. The interview guide was reviewed after reading the transcripts from the first 2 focus-group interviews. Because there was a discussion in the first 2 interviews as to whether or not communication skills could be learned, the authors included this a topic in the interview guide for the third focus group.

### Data collection

UØS moderated the first group focus group alone, and the second with KS as a co-moderator. The final focus group was moderated by AJR with UØS as co-moderator. All the focus-groups were held in small hotel conference rooms that were easily accessible for the project pharmacists. The first 2 focus groups each had 4 participants, the first representing 3 different pharmacies, the second 4 different pharmacies. The final interview had 6 participants, representing 3 different pharmacies. Each lasted about 90 min. At the end of the first focus-group the moderator gave a short summary, giving the participants the opportunity to clarify any possible misunderstandings or add points that had been missed. In the final 2 groups the co-moderator had this role. The co-moderators in focus group 2 and 3 also asked some clarifying questions and took field notes. All interviews were audio-recorded and were transcribed verbatim by AJR using HyperTRANSCRIBE™ for Mac 2013 (V.1.6.1; ResearchWare Inc, Randolph, Massachusetts, USA). Data collection took place between August and September 2017.

### The research team

First author is a pharmacist and a Doctor of Philosophy (PhD) candidate and has experience working in community pharmacies. Last author is a graduate engineer, an associate professor in laboratory science and the main supervisor for the PhD candidate. Second and third authors are pharmacists; both hold a PhD in social pharmacy and work as associate professors. Three of the authors have experience of qualitative research. The second last author is a physiotherapist, holds a PhD and works as a professor. She is highly experienced in qualitative research. She had no contact with the participants. All the researchers are female.

### Analysis

Systematic text condensation (STC) was used for data analysis.<sup>24</sup> STC is an analytic approach well suited for thematic content analysis across interview data. The method includes 4 steps in the qualitative analysis process, quite similar to other existing thematic content analysis. First, 3 of the authors read the transcripts separately, to obtain an overview of the data, and identified preliminary themes that represented the various aspects of the pharmacists' experiences of the diabetes risk-assessment study (overview of the themes and the analytical process, Fig. 1). The authors then met for discussion and reached a consensus on the preliminary themes to take further in the analysis. Secondly, units of meaning, a text fragment containing information relevant to the research question, were identified, and coded independently. Thirdly, 3 of the authors discussed the coding, and a process was followed to reach a consensus. A condensate was then developed for each code group in first-person form, aiming to catch the most important meanings in the meaning units, adhering closely to the pharmacists' wording. It contains a transformation from the pure listing of the meaning units and is hence an interpretation grounded in the meaning units. Finally, in the fourth step, generalized descriptions of the pharmacist's experiences with the diabetes risk assessment was developed (analytical text) and illustrated

**Table 1**

General characteristics of the pharmacists participating in the 3 focus-group interviews (N=14).

Age (years), median (min–max)	40 (27–64)
Gender, n	
Women/Men	8/6
Level of education, n	
Bachelor of pharmacy	5
Master of pharmacy	9
Graduating year, median (min–max)	2007 (1981–2017)
Pharmacy school, n <sup>a</sup>	
Norway <sup>b</sup>	11
Outside Norway <sup>c</sup>	4
Pharmacy work experience (years), median (min–max)	10 (3–36)
Current position, n	
Pharmacist	9
Pharmacy manager	5

<sup>a</sup> The total is 15, because one pharmacist was educated both in Norway and abroad.

<sup>b</sup> The pharmacy schools represented were the University of Oslo, Oslo Metropolitan University and the Arctic University of Norway.

<sup>c</sup> Denmark, Serbia and Iceland were represented.

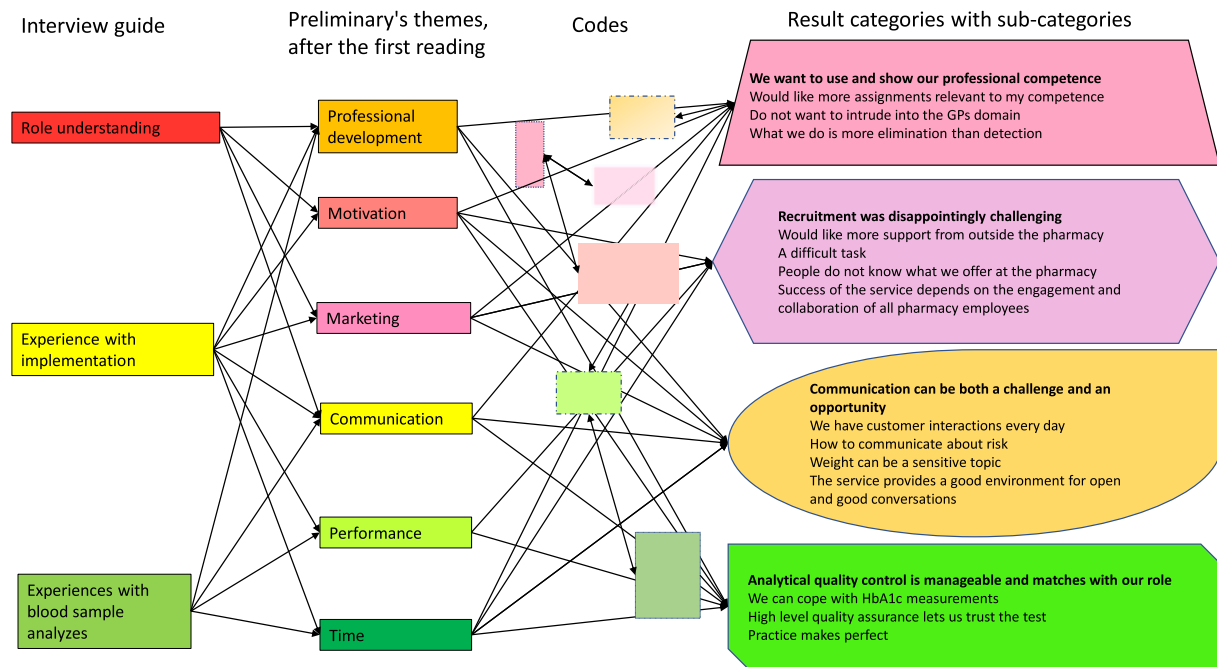


Fig. 1. The analytic process using Systematic Text Condensation.<sup>24</sup>

by a quotation. At each step 4 of the authors deliberated over the code groups/text. MR also read the code groups and the analytical text and gave feedback throughout the analytical process. After the results section had been written, the transcripts were read one final time to make sure that nothing important that reflected the aim of this study had been lost during the analytical process. Supplementary file 2 shows an excerpt of the analysis from step 2 to step 4.

### Ethics

The study was approved by the Norwegian Social Science Data Service (Project number: 53920). The Norwegian Regional Ethics Committee was contacted, and it stated that ethical approval was not required (document ID: 717671). Participation was voluntary, and all the participants signed an informed consent. Before the focus-group interview started, the pharmacists were reminded that the information shared was confidential. The participants could withdraw from the study at any time before the group interviews were held, without giving any reason. The names of the participants were not included in the transcripts, and the transcripts were password-protected and stored at a secure location.

### Results

The analysis identified 4 main result categories (Fig. 1), namely: We want to use and show our professional skills; Recruitment was disappointingly challenging; Communication with customers can be both a challenge and an opportunity, and Analytical quality control is manageable and matches our role. They are elaborated on below.

#### *We want to use and show our professional skills*

In general, the pharmacists wished to use their knowledge in order to improve customers' health. This contrasted with how they perceived the development of Norwegian pharmacists' role in recent years. The pharmacists emphasized that they would prefer more attention to health promotion and less focus on sales.

"It was nice to do something professional. Because in pharmacies there is a lot of focus on sale, and it is a good idea to have a professional project. Because that's where we want to be. To show what we are able to do." (FG3/1)

Assessing the risk of developing T2D was an opportunity to steer the development of the pharmacists' role towards more health promotion. The pharmacists appreciated the research element of the project and believed it was important to explore whether the service fulfilled its purpose before implementation in the pharmacies. Non-research-based services had been offered as a project in some of the pharmacies, and the concern was raised that this could undermine people's long-established trust in pharmacies.

"I also think it is extremely important to get some documentation about what works and what doesn't work in the pharmacies. (...) Of course, everything we do in the pharmacy is important and means a lot to the customer. But we can't document it. We just say it works. So, we have to get some documentation." (FG1/2)

The pharmacists found it motivating to participate in the project and be involved in diabetes risk-testing. Although they found it exciting offering health services at the pharmacy, they were also concerned that the service could create a conflict of interest with GPs. Diagnostics is an important part of GPs' field of knowledge, and the pharmacists emphasized that they did not want to intrude into this domain.

"The physicians feel that we interfere and take a share of the market they make their money from ... So, we're a bit careful because we do not want to get into a dispute with the GPs." (FG2/1)

The pharmacists had, however, identified that their customers needed easier access to health information and risk assessments than GPs' offices could provide. They believed they could fill this gap without taking on part of the GP's role. A few pharmacists mentioned the criticism that risk-assessment services may contribute to increased health anxiety. Most pharmacists, however, believed they could provide reassurance for people at a low risk of developing diabetes.

“What we did, it was probably more sorting out those who did not have diabetes, more than detection of disease. In most cases.” (FG3/2)

#### *Recruitment was disappointingly challenging*

In general, the pharmacists found it hard to recruit participants to the risk-assessment service and identified this as a main barrier to implementation of the service. Some of the participants stated that pharmacists are not ‘born sellers’ and were uncomfortable embracing this role, because it entailed being proactive and outreaching. The pharmacists did, however, recognize their changing role in terms of focusing more on sales.

“It was difficult. I think it was difficult to ask people if they wanted to be tested for diabetes, because I was so afraid that people would be upset. ‘Do I look like I have diabetes?’” (FG2/3)

The recruitment training that the study pharmacists received before the project started was helpful, but despite this they found it difficult. Their initial optimism decreased as the project proceeded, because they did not manage to recruit the expected number of study participants. Words such as ‘sadness’ and ‘embarrassment’ were used to describe emotions related to what they perceived as a failure to achieve the recruitment goals. While some of the pharmacists mentioned that their working days were too busy to allow time for recruitment, others did not see time as a challenge.

The pharmacists discussed the fact that pharmacy customers need time to grow accustomed to new pharmacy services, and that customers will not ask for an unfamiliar service at the pharmacy. The pharmacists suggested that if this service had been permanent, pharmacy customers might have requested it more frequently. They commented that an increased number of customers requested the service after the 6-month inclusion period.

“We did not have the impression that there was a huge demand for it [this service] either. Perhaps it was a bit too new for the customers. They are not used to this type of service at the pharmacy.” (FG3/2)

The pharmacists suggested that better marketing of the project would have created more awareness and recruited more participants. Some pharmacists mentioned that the posters could have been larger and the flyers more informative. They also commented that while other national campaigns offering new health services in pharmacies have been promoted through TV commercials and large-scale media coverage, that was not the case for this project. Increased local campaigning within the pharmacy was stated as being challenging, especially at times when the pharmacy was short of staff. A continuous focus on the project on the part of all the staff was important in terms of motivating the staff and recruiting participants. One pharmacist, for example, shared the story of how identifying T2D in one of their participants made the entire pharmacy workforce feel that the service was important and meaningful, and gave them extra motivation.

“We worked together as a team, and everyone had to get involved, otherwise we could not reach our goal. And we struggled a bit because we did not have enough people at work.” (FG2/2)

Most of the pharmacists did not see money as being a main motivating factor, though one pharmacist suggested that a personal payment for each risk assessment they performed would have been motivating, making a comparison with GPs’ remuneration for consultations.

#### *Communication with customers was both a challenge and an opportunity*

Communication was a crucial part of the risk-assessment service. The pharmacists had received differing amounts of communication training

during their pharmacy education, and there was some discussion about whether communication skills were something that could be learned, or whether they were simply part of one’s personality. Comprehensible and professional communication with the participants during the risk-assessment service was sometimes perceived as being challenging, especially when they were not fluent in Norwegian. It was emphasized, however, that communicating with customers is something pharmacists are generally comfortable with, because talking to customers is a major part of their job. At first some of the pharmacists were nervous about this task. However, as they experienced that they had enough knowledge about diabetes to answer the customers’ questions, the communication became easier to handle.

“I think it was okay to communicate with them [low-risk customers]. We do have knowledge about diabetes and what may increase or reduce the risk, and we are used to talk with customers. We speak their language and it’s not too advanced.” (FG3/6)

During the project, the pharmacists experienced the importance of explaining to the participants in advance that the HbA1c measurement would only be performed on those with a high-risk score. Otherwise some of the participants would get annoyed, because the HbA1c measurement was their main reason for participating. Many participants were nevertheless pleased when the pharmacists managed to communicate that having a low-risk score was something positive. Despite the fact that many pharmacists found risk communication manageable, some found it challenging to communicate the seriousness of the diabetes risk without frightening the participant.

“... beforehand I was quite nervous. When I took those blood samples, I hoped it was not a high [HbA1c] score. I found it hard to tell them that ... to make them understand that they had to visit their doctor without frightening them. What if they went home and were really afraid? But they had to understand that it was serious.” (FG2/3)

One pharmacist was apprehensive about addressing high weight and waist measurements without offending the participants. Others saw this service as a great opportunity to talk to the participants about the association between abdominal fat and increased risk of heart disease and diabetes. Many participants also addressed their weight themselves, giving the pharmacists an opportunity to inform them about weight and lifestyle changes, focusing on the fact that even small measures can have a positive effect on lowering the risk of developing T2D.

The pharmacist-patient encounters in this service were described to differ significantly from those that occur during routine dispensing in the pharmacies and they gave other opportunities. The pharmacists reported that the participants appreciated the fact that the pharmacists had time to talk to them, as well as having a conversation in a more private room rather than over the counter. One pharmacist reported how an older couple were so pleased with the service that they insisted on giving them a hug. Most pharmacists experienced the service as being positive, not only for the participants but also for themselves. The encounters with the participants expanded the pharmacists’ horizons in several ways; it was more than just a risk assessment.

“(...) what was interesting to me was the amazing patient consultations, not only about diabetes, but also other things. So, you got a lot of contact with people, patients, customers, which enriched my soul (...).” (FG1/1)

#### *Analytical quality control is manageable and matches our role*

Implementation of the analytical quality assurance was considered straightforward. Many pharmacists mentioned earlier experiences as being useful for the analytical quality assurance, e.g. measurements of blood glucose and risk assessment for heart disease at the pharmacy,

laboratory work during their studies or previous work in the medical industry. Despite this, one pharmacist was a little worried about the blood sampling. After her first sampling, however, she felt relieved, and found that it was nothing to worry about.

The pharmacists were aware of the consequences if they deviated from the quality-assessment procedures. Deviations could affect the quality of the HbA1c measurement and have severe consequences for the participants. The performance of internal and external quality control of the HbA1c instrument allowed them to rely on the HbA1c measurements.

“It’s quite reassuring, I think. That you actually perform a control. So, when you tell the customer the result, you know it is correct.” (FG3/4)

A few pharmacists did, however, question the benefit of the analytical quality-assurance procedures. One pharmacist admitted that as a consequence of the slow recruitment, the focus on recruitment was increased at the expense of spending enough time on analytical quality assurance.

The pharmacists experienced differing challenges in the performance of the internal and external analytical quality control. These included performing the internal quality control analysis regularly as part of their daily routine and having a functional system for recording the results. Furthermore, they found that it was technically more difficult to analyze the internal and external control compared to blood samples, and the procedures were time consuming. As they were not used to analyzing external quality controls, and since they received the controls material only every third month, they did not really get into the routine of the procedure during the project period. Sometimes they also forgot to keep the material refrigerated. However, they believed that these challenges were associated with start-up difficulties that would decrease when the diabetes risk service eventually became routine.

## Discussion

### *Main findings*

The aim of this study was to explore Norwegian pharmacists’ experiences in offering a diabetes risk-assessment service, including analytical quality control, in community pharmacies. The pharmacists emphasized the importance of using their knowledge and skills to promote good health in the population. They also perceived that offering this service was compatible with their professional role. However, recruiting participants was deemed challenging. As communication is an essential part of their work, many pharmacists evaluated their communication skills as being good, though some aspects of communication when offering this service were seen as a challenge. To our knowledge, this is the first study exploring community pharmacists’ experiences of participating in a quality control scheme to ensure the accuracy and precision of their laboratory testing. The analytical quality control was seen as a natural part of their job and a manageable task.

### *Strengths and limitations*

A strength of this study is the fact that the members of the research team have different backgrounds and experience of qualitative research, and that they analyzed the data together using a predefined iterative method.<sup>24</sup> Also, KS and MR were experienced in using focus groups, and both of them contributed to the planning and analyzing of the study. The use of Systematic Text Condensation as an analytic approach allows less experienced qualitative researchers to maintain a responsible level of methodological quality.<sup>24</sup> The group dynamic provided a rich and varied basis for 2 of the 3 focus groups – one of the strengths of using focus-group interviews.<sup>22</sup> In the third group the conversation was not as fluent, still this group contributed with valuable input to the research

question. All together these 3 focus groups gave a sufficient data to answer to the research question. Ten out of the 11 pharmacies from the main study were represented in the focus groups. The 3 dominating pharmacy chains in Norway are very similar. Still, if the service had been introduced in all pharmacies in Norway, rather than in self-selected pharmacies, there may have been a broader range of experiences, and other themes may have emerged. The fact that AJR, who had been closely involved in developing the risk assessment service, did not attend 2 of the focus groups may have made it easier for the participants to talk about negative experiences regarding the diabetes risk-assessment service. They did not need to worry about disappointing her. This may explain why the diabetes risk-assessment study was criticized more during the initial interviews, in which AJR did not attend, than in the final interview, for which she was the moderator. Inclusion of a purposive sample of pharmacists is also a strength and gives the study greater informative power.<sup>26</sup>

### *In line with their role as pharmacists*

The pharmacists participated in this diabetes risk-assessment study because they wanted to expand their role in terms of offering health services. This is in line with an English study, in which the community pharmacists considered diabetes prevention to be part of their public-health role.<sup>20</sup> It is also in accordance with the FIP’s and the WHO’s recommendation regarding increased involvement of pharmacies in disease prevention.<sup>3</sup> Thus, our study seems to have narrowed the gap described in an earlier study by Svensberg et al.,<sup>8</sup> between the way community pharmacists perceived their current practice and the way they wanted to practice. In that study, the pharmacists described their ideal way of practice as a more patient centered care. However, they felt powerless in terms of their possibility of steering their role more towards patient care.<sup>8</sup> In our study, however, the pharmacists seemed to take responsibility for their role development, by choosing to participate in the project. This may be because “our” pharmacists represent a sample who are especially willing to take responsibility for development of their role. Also, through participation in this diabetes risk assessment service the pharmacists experienced that an expansion of their role towards extended patient care was feasible. The pharmacists in the earlier Norwegian study<sup>8</sup> represent the status quo of pharmacy practice in Norway at the time of the study. In the UK community pharmacies provide the NHS Health Check program which assess an individual’s risk of developing diabetes.<sup>27</sup> Thus, the UK pharmacists’ experiences<sup>20</sup> probably also reflect that the service is more integrated in the pharmacy.

### *Recruitment of participants as a main barrier*

The pharmacists in this study identified several reasons why they did not succeed in recruiting the number of customers they had hoped for. They did not feel that the recruitment-aspect of the service was a natural part of their role. In line with this, a systematic review exploring pharmacy staff’s perspectives regarding the barriers to and facilitators for implementing new services at a national level, found difficulty recruiting patients to be a barrier.<sup>28</sup> Based on our findings, we recommend including specific practical skills training focused of how to approach customers about new services when performing studies such as this. The systematic review also explored pharmacists’ perspectives with regard to implementation of innovations, and reported a need for better advertising and promotion.<sup>28</sup> Social support is a known factor for successful implementation,<sup>28</sup> and this aligns with the finding that the pharmacists stated that the recruitment process was more successful when all the pharmacy staff worked together as a team and took a proactive role in recruitment. This adds to the research showing how important good pharmacy teamwork is for innovation, effective services and improved patient care.<sup>29</sup>

*The service opened for more meaningful communication*

The pharmacist/participant communication in the diabetes risk-assessment project was described as more meaningful than the pharmacist/customer communication in the pharmacists' routine work. Likewise, an American study found that customers appreciated the undivided attention they received in a similar setting compared with a standard conversation in the pharmacy.<sup>30</sup> Use of a private room may have an effect on what a customer decides to disclose and was probably an important success factor. For example, the patients opened up and initiated discussions about lifestyle issues. Improved involvement of pharmacists and a better relationship with the patients<sup>28</sup> have also been found in a systematic review of services such as a medicine use review.<sup>31</sup> The risk-assessment service in this study did not involve use of computer screens, and this may also have had a positive effect on pharmacist/participant communication. A Swedish study found that computer screens can limit pharmacists' ability to practice patient-centered care.<sup>32</sup> It seems as if communication in such a context provides a new dimension of pharmacist/customer interaction, compared with standard communication over the counter.

Risk communication is a complex process,<sup>33</sup> and a barrier identified in our study was finding a balance in terms of risk communication. This is in line with Australian and English studies, which explored community pharmacists' experience regarding risk communication in connection with alertness-impairing medicines<sup>34</sup> and Human Immunodeficiency Virus (HIV) testing.<sup>35</sup> They found that some of the barriers having an adverse effect on risk communication were discomfort in communicating the result to the patient, and whether the customer had a different agenda than that of the pharmacists.<sup>34,35</sup>

The amount and nature of communication training that was included in their basic pharmacy education varied from one participating pharmacist to another in this study. We experienced that the pharmacists appreciated the extra communication-practice that was included in the training prior to the study. This gave them increased confidence when communicating risks. Still, in hindsight there should have been more recruitment-specific practice, to give them tools to approach different types of customers.

*Analytical quality control in community pharmacies*

The pharmacists in this study were familiar with laboratory work and identified analytical quality control as something that matched their professional role. Previous studies have also shown that many pharmacists are willing to provide POCT, e.g. for influenza, streptococcal pharyngitis<sup>36</sup> and human immunodeficiency virus (HIV),<sup>35</sup> in a community-pharmacy setting. Other studies exploring pharmacists' experiences of internal and external analytical quality control for POCT have not been found. A systematic literature review did find that analytical POCT in pharmacies is acceptable compared with the laboratory standard,<sup>37</sup> but did not explore whether pharmacists identified analytical quality control as being part of their role. This aspect was, however, explored in this study, and the approach was in line with the finding that pharmacists wanted to expand their professional role.

*Practical implications and further research*

The results indicate that pharmacists need more support and training in promoting a diabetes risk-assessment service, because they did not feel comfortable actively promoting the service themselves and identified this as a main barrier to implementation of the service. Role-playing sessions, where the pharmacists could practice different approaches to recruitment would be useful. In addition, both the pharmacy management and the pharmacy-chain management could assist in the promotion, as well as the pharmacy association. Future research into this aspect is needed – e.g. pharmacists' perception of offering such a service with a greater focus on marketing outside the pharmacy, including TV

and social-media advertising. The results also emphasized the importance of all the pharmacy staff working together as a team. It is thus suggested that future research should focus on any difference in recruitment when the entire pharmacy staff are involved, compared with only having a few dedicated project pharmacists. Future implementation studies may also benefit from giving both the pharmacy staff and pharmacy customers sufficient time to familiarize themselves with the new service before measuring uptake and effects. In a full-scale implementation of such a service, lack of reimbursement for the risk assessment service could be a major barrier to implementation and the effect of customers co-payment should also be explored. Also, as the results of this study add the performance of analytical quality control as part of the ongoing development of expanding pharmacists' professional role, a confirmation of this finding would be valuable.

**Conclusion**

Offering a diabetes risk-assessment service is in line with how a selected group of Norwegian community pharmacists perceived their professional role. However, they were uncomfortable recruiting participants, and expressed a wish for more support from the pharmacy chain here. Inclusion of the entire pharmacy staff as a team was deemed an important success factor for implementation of such a service and should be considered before implementing a diabetes risk service on a larger scale. Also, the results add the performance of analytical quality control as part of the ongoing development of expanding pharmacists' professional role.

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**CRediT authorship contribution statement**

**Aslaug Johanne Risøy:** Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Visualization, Project administration. **Reidun Lisbet Skeide Kjøme:** Conceptualization, Methodology, Formal analysis, Writing - review & editing, Visualization, Supervision, Funding acquisition. **Karin Svensberg:** Formal analysis, Investigation, Writing - review & editing. **Målfrid Råheim:** Formal analysis, Methodology, Writing - review & editing, Supervision. **Una Ørvm Sølviik:** Conceptualization, Methodology, Formal analysis, Investigation, Writing - review & editing, Visualization, Supervision, Funding acquisition.

**Declaration of competing interest**

None.

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**Appendix A. Supplementary data**

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