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## Original research

# The options of the management of self-monitoring of blood glucose in primary health care centres by the diabetes nurses and patients

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## ABSTRACT

The aims of the present study were to investigate the diabetes nurse specialists (DNS) practice according to the local diabetic guideline, to study the DNSs' opinion of self-monitoring of blood glucose (SMBG) and prescription of test-strips, to investigate the patients' opinions and habits when using SMBG. Users of SMBG ( $n = 533$  patients) and all DNSs ( $n = 25$ ) were telephone interviewed. Only a few DNSs used local guidelines, the majority had their own prescribing strategy of SMBG. In conclusion, DNSs were aware of the guidelines but did not use them to support their decision regarding the reasons for prescribing SMBG or not. For diabetes patients, reassurance was the most important issue in having access to SMBG, despite the fact that one-third retested but did not change their behaviour and nearly 15% contacted their DNS for advice.

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## 1. Introduction

Type 2 diabetes often starts at around age 40 and is highly associated with obesity and a sedentary lifestyle. The prevalence of the disease in Europe is about 4%, and in certain ethnic groups even higher [1]. The prevalence in one of the counties

in Sweden, where the present study was conducted, was 4.6%; of which type 2 diabetes represents 85–90% [2].

In Sweden, type 2 diabetes patients are often treated in primary healthcare centres (PHCC) by general practitioners (GPs) and diabetes nurse specialists (DNSs) at a diabetes nurse practice (DNP). The National Board of Health and Welfare in Sweden has encouraged the establishment of clinics, staffed

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by nurses, for adult patients with asthma, diabetes and hypertension. The reasoning behind this decision is that a surgery staffed by specially trained nurses facilitates the gaining of experience and raising competence at PHCCs [3].

The trend in diabetes care is towards a more patient-centred approach, resulting in a change in the role of the DNS and his/her way of working [4]. Teaching self-management has traditionally consisted of presenting a large quantity of information to the patient, with predetermined facts and content. Diabetes Self-Management Education (DSME) is the ongoing process of facilitating the knowledge, skill and ability necessary for diabetes self-care [5]. The goals of DSME are to optimize metabolic control, quality of life and to prevent complications, while keeping health costs acceptable. DNSs are trained in empowerment strategies to increase individual patients' understanding of chronic disease. In an educational situation, the DNS motivates the patient to take in knowledge and subsequently use this for self-influence and to change his/her situation [6]. This self-care strategy is supported by both national diabetes guidelines and by the local county-based guidelines of the present study [7,8]. Both recommend that "Every PHCC should have a DNS with special training in diabetes, educated to university level" [7,8]. The guidelines also state that "The workload of the DNPs should be at least 20% duty per 100 diabetes patients" [7,8]. They further stipulate that all diabetes patients should be given the option to self-monitor their blood glucose (SMBG) [7,8]. The DNSs teach the patients how to perform self-monitoring at home and how to interpret the results [4].

Once blood glucose levels are well under control, patients should then be advised to reduce their self-monitoring frequency [9]. Studies have shown that many patients do not know how to interpret the results [10]. However, patients who had self-reported a moderately or poorly controlled diabetes status were more likely to use test strips than those reported to be well controlled [11]. Not well controlled diabetes patient require extra attention from the DNS, as their perception of diabetes status does not correspond with objective measures of disease severity [11]. The effectiveness of SMBG as a tool for patients with type 2 diabetes not using insulin was under discussion when the present study was performed [12,13]. Some studies reporting a positive association between SMBG for patients with type 2 diabetes and glycaemic control, SMBG had been integrated into an educational programme aimed at enabling patients to interpret the results and take the appropriate actions [13,14].

We recently conducted a cross-sectional observational study in two counties, A and B, studying the use of SMBG in patients with type 2 diabetes in PHCC [15]. In brief, the conclusion was that SMBG was not associated with improved glycaemic control in any therapy treatment category of diabetes patients [15], which is in agreement with a recently published study [16]. The lack of improved glycaemic control among those using SMBG could not be explained by differences in comorbidity between users and non-users of SMBG.

The aims of the present study: to investigate the practice of DNPs and DNSs' opinions of SMBG and the prescribing of test strips and to investigate diabetes patients' opinions and practices in their use of SMBG.

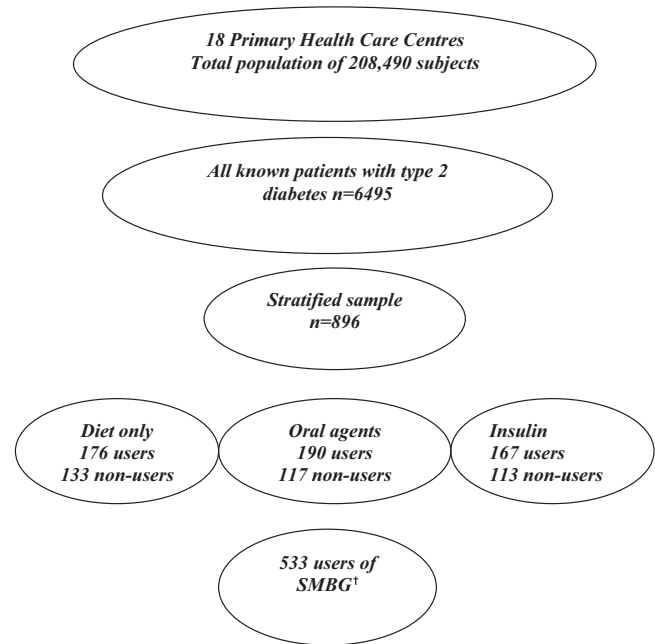


Fig. 1 – Flowchart of the study design. †Self-monitoring of B-glucose.

## 2. Material and methods

The present study is based on data from a cross-sectional observational study conducted in two Swedish counties, here named A and B, on diabetes patients at PHCCs serving a total population of 208,490 individuals. At the time of the present study, county A had uniform diabetes guidelines, based on the Swedish national diabetes guidelines [7]; in county B, there were no uniform diabetes guidelines. After exclusion of Type 1 diabetes patients and elderly patients living in nursing homes, all diabetes patients ( $n = 6495$ ) at the 18 PHCCs were registered with respect to age, gender, treatment category, HbA1c and the number of visits to a PHCC (Fig. 1).

Depending on whether test strips for SMBG had been prescribed within the past year or not, the patients were categorised as users or non-users of SMBG (3299 men and 3196 women, of whom 58% were users of SMBG). The treatment categories of diet only (32%), oral agents (37%) and insulin (31%) showed a similar distribution across the PHCCs. A random sample stratified for age, gender and treatment category was selected from the population of 6,495 patients; 896 patients were sampled, of whom 363 were non-users of SMBG and were excluded. The 533 users received a request to participate in a telephone interview regarding their views of SMBG and practices in using it. If a user did not respond or refused to participate, the next patient on the list of 6495 patients was added to the sample. If a patient needed an interpreter or had other limitations which made the telephone interview difficult, they were excluded. Approximately 60 patients were excluded in this way, representing all three treatment groups and different ages. We used the costs of prescribing SMBG to differentiate between the PHCCs for the year of the study. PHCCs were ranked by prescribing costs from the lowest to the highest, divided into two groups, and labelled low prescribing

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