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# Screening for type 2 diabetes and pre-diabetes in general practice: A descriptive study of Maltese practices

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ABSTRACT

*Objective:* The aim of this research study was to ascertain the awareness of Maltese family doctors to the prevalence and significance of impaired glucose regulation and early diagnosis of type 2 diabetes and whether practices were influenced by employment status, post-graduate training in diabetes or years since graduation.
*Methods:* A specially constructed questionnaire was distributed by mail to all the 298 family doctors listed as Specialists in Family Medicine in the Maltese Medical Council register. Participants had to be practising family medicine in Malta. Results were analysed using SPSS 20.0 aiming for a significance criterion of 0.05 and a power of 80%.
*Results:* Valid replies were received from 154 GPs (51.7%). 93.2% claimed to offer their patients some form of screening. Screening levels reached up to 95.9% in the presence of specific risk factors (e.g. high previous HbA1c levels) but fell to between 46.2% and 58.7% in patients over 50, the physically inactive and those who suffer from polycystic ovarian syndrome. Screening using capillary glucose is widespread (70.8%) as opposed to the oral glucose tolerance test (23.4%). Results also show a high use of urinalysis in screening (53.2%) and a paradoxical lack of use of HbA1c in screening by young doctors and by those with recent extra training in diabetes.
*Conclusions:* The need for a structured screening programme in Malta and its viability need to be evaluated by further studies. Educational support to GPs together with logistic support for GPs needs to be improved.
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## 1. Introduction

Diabetes mellitus is a metabolic disorder characterised by chronic hyperglycaemia with a disturbance of carbohydrate, fat and protein metabolism resulting from defects of insulin secretion, insulin action, or both [1].

The prevalence of type 2 diabetes is increasing rapidly worldwide. The estimated 285 million people that were afflicted by the disease in 2010 are expected to increase

*Abbreviations:* IDF, International Diabetes Federation; IFG, Impaired Fasting Glucose; IGT, impaired glucose tolerance; FCWB, fasting capillary whole blood; RCWB, random capillary whole blood; FVP, fasting venous plasma; RVP, random venous plasma; HbA1c, glycated haemoglobin; OGTT, oral glucose tolerance test.

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to 439 million people within 20 years [2]. The International Diabetes Federation (IDF) [3] estimates Malta's national prevalence of type 2 diabetes at 9.6% with an impaired glucose tolerance (IGT) prevalence of 8.84%. Similar tendencies are reported in IDF's estimates for other Mediterranean countries like Spain, Slovenia, Montenegro, Libya, Egypt and Algeria [3]. About a third of the cases of diabetes in people aged 20–79 in Malta are still undiagnosed [3]. Europe has an estimated prevalence, at age 20–79 years, of diabetes of 8.5% and of 9.2% with IGT. 36% of people suffering from diabetes in Europe remain undiagnosed [3]. Measured BMI in the Maltese population shows that, in the population aged 25–64, 47.2% are overweight and 29.6% are obese [4]

A number of studies have confirmed that the onset of type 2 diabetes can be reversed or delayed. Most of these studies have aimed at a combination of dietary measures and physical activity leading to maintaining a healthy body weight [5–10]. Several studies have provided evidence that diabetes-related tissue damage is present during the preclinical phase of conventionally diagnosed or screen-detected diabetes [11–14]. As people with impaired glucose regulation tend to share the same risk factors as those with diabetes, attention has recently turned to the early diagnosis of those with impaired glucose regulation. This is because it is likely that having a high blood glucose for years on end may represent a harmful "legacy effect" [15].

When it comes to identifying people at risk of developing diabetes, most professional organisations recommend a targeted and opportunistic approach in a high-risk population using either of two methods [16–21]:

a. using demographic and clinical characteristics such as previous laboratory tests, or
b. completing a questionnaire based on factors that indicate the presence and extent of a number of aetiological factors for type 2 diabetes.

These two approaches serve as primary and cost-efficient tools in identifying a subgroup of the population in whom further glycaemic testing may be necessary. As this initial screening test is not diagnostic, glycaemic testing is necessary as a second step to appropriately define impaired glucose homeostasis [22].

## 2. Research design and methods

The principal aim of this research project was to analyse the awareness of Maltese family doctors to the prevalence and significance of impaired glucose regulation and the early diagnosis of diabetes.

This study also aimed to analyse whether any form of screening was being carried out, whether electronic records and recalls were being utilised in screening, what biochemical laboratory tests were being used and whether these were being used in sequence or in any specific order. The study also investigated whether these practices are in some way influenced by the number of years since graduation, by recent training in diabetes or by the different modes of doctor employment.

A review of the literature did not identify a questionnaire which has been used and validated in similar circumstances. Therefore a specially constructed questionnaire was formulated, making extensive use of guidelines adopted in other countries when screening for diabetes and pre-diabetes. The guidelines used were those issued by the American Diabetes Association [16], NICE [18], Diabetes UK [19], ESC-EASD [22], and IDF [23].

After piloting, the final version of the questionnaire was distributed by mail to all Maltese family doctors listed on the Medical Council's register for specialists in family medicine published online on the 1st October 2012. Consent was implied by the return of the questionnaire. The postal questionnaire was considered the most appropriate instrument because of the geographical dispersion of participants.

Out of the 349 doctors listed on the register, 51 have either opted not to have their address listed in the register (thereby becoming unreachable for this study) or have listed an overseas address (and therefore were automatically excluded from this study as they were not practising in Malta).

### 2.1. *Inclusion criteria*

Participants had to be listed in the Specialist in Family Medicine Register issued by the Malta Medical Council on 1st October 2012. They also had to be practising family medicine in Malta.

### 2.2. *Exclusion criteria*

Any doctors who had stopped practising or had taken up a different specialisation were excluded. Doctors living and working outside Malta were also excluded.

The study aimed to reach a significance criterion of 0.05 and power of 80%. As this was a new area of enquiry, one would need to assume an effect size to be small i.e. 0.20. A statistician advised that to achieve this, a response rate of 150 out of a population of 350, was needed. Considering the small total population ($n = 298$) and the possibility of a low response rate, it was decided to include all the population as the sample for the study with the aim of avoiding invalidation of the study due to small numbers.

SPSS 20.0 was used to analyse the data collected from the questionnaires.

The study was approved by the Research Ethics Filter Committee of the University of Ulster.

## 3. Results

157 out of the 298 questionnaires distributed were returned (a response rate of 52.7%). Three of the respondents answered that they do not practise family medicine and were therefore excluded. The resulting 154 answers represent a 51.7% valid response rate. This rate compares favourably with similarly conducted local studies [24,25].

79.2% of those who replied were male. Most were aged between 41 and 50 years (35.1%) with 21–30 years of practice experience (47.4%). Sciortino (2002) reports an 80% male GP

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