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Evaluation of Cardiovascular Risk Factor Control Among People with Diabetes in the Community Pharmacy Setting—A Descriptive Observational Study †

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Abstract

Background: In some countries, community pharmacists provide advanced services to people with diabetes that improve glycaemic control and cardiovascular risk. This study aims to describe the cardiovascular risk profile of people with diabetes attending community pharmacy in Ireland. **Methods:** Data collection for this descriptive, observational, cross-sectional study took place in 10 pharmacies, in four Irish counties between July 2018 and October 2019. Participants were aged ≥18 years, with type 1 or type 2 diabetes, attending a participating pharmacy and were dispensed oral diabetes medicines, insulin, or devices for monitoring glycaemic control. Participants were asked about their demographics, medical history, and cardiovascular risk factors. Current medications were identified from dispensing software. **Results:** Data were available for 106 participants; 70 (66.0%) were male and 36 (34.0%) were female. The median age was 66.0 [56.5: 72.0] years. Of these, 90 (84.9%) had type 2 diabetes. Hypertension and dyslipidaemia were reported by 60 (56.6%) and 59 (55.7%) participants, respectively. Twenty-one participants (19.8%) were current smokers, 31 (29.2%) followed no specific diet, and 44 (41.5%) did not undertake exercise. Oral diabetes medication was prescribed to 85 (80.2%) and insulin was prescribed to 29 (27.4%) participants. Where an antihypertensive was prescribed, 21 participants (19.8%) achieved the systolic blood pressure on-treatment goal of ≤130 mmHg and 34 (32.1%) achieved the diastolic blood pressure on-treatment goal of <80 mmHg. **Conclusions:** Study participants demonstrated a high rate of characteristics associated with increased cardiovascular risk, including non-achievement of target blood pressure, smoking, and lack of exercise. A community pharmacist-led intervention aimed at potentially improving cardiovascular risk factors in people with diabetes warrants further study in an Irish setting.

Keywords: diabetes mellitus; pharmacists; community pharmacy services; heart disease risk factors

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1. Introduction

Diabetes affects approximately 5.6% of Irish adults with the prevalence rising to 7.7% of people aged 50 years [1,2]. The Irish Health Service Executive aims to decrease

mortality and morbidity associated with diabetes by reducing cardiovascular events by 20% by increasing access to structured care programmes for all people with diabetes [1]. All members of the healthcare team need to join the fight against diabetes and play an active role in achieving these national goals.

Internationally, it has been shown that community pharmacists' interventions are associated with improvements in glycaemic control, cardiovascular risk, and medication profiles in people with diabetes [3–5]. The RxEACH study was a community pharmacy-based intervention program that included people with type 1 and type 2 diabetes and demonstrated a 21% relative risk reduction for major cardiovascular events among participants with diabetes when compared to usual pharmacist practice [4]. This reduction in risk was driven by significant reductions in HbA1c levels (absolute reduction 0.9%), blood pressure (absolute difference in change in systolic blood pressure (SBP) of 8.6 mmHg and in diastolic blood pressure (DBP) of 2.7 mmHg), and LDL-cholesterol levels (absolute difference in change of 0.2 mmol/L) [4]. A significant improvement in exercise frequency was also seen in the intervention group [4].

Furthermore, studies in Australia and the United Kingdom (UK) have also shown positive outcomes associated with pharmacists' interventions among people with diabetes, particularly in those who have type 2 diabetes [6,7]. Studies published by both Krass et al. [6] and Ali et al. [7] delivered diabetes education to pharmacists who then performed an intervention in people with type 2 diabetes. In the study conducted by Krass et al., people with type 2 diabetes checked and recorded their blood glucose at least once daily, and this record was reviewed by the pharmacists at each of the five visits over a six-month period [6]. At each visit, the pharmacists provided counselling, based on the blood glucose record, and delivered further interventions such as medication adherence support, the identification of drug-related problems, and referral to a general practitioner where appropriate [6]. A significant reduction in HbA1c in the intervention arm, compared to the control arm, was reported over the six-month study period [6]. In a study conducted by Ali et al., participants received six pharmacy appointments over a 12-month period [7]. Participants' body mass index, blood pressure, and blood glucose, HbA1c, and blood lipids were reviewed, and pharmacists provided medication use review, lifestyle counselling, and referrals to a general practitioner as appropriate, based on participants clinical measurements [7]. Significantly reduced SBP, blood glucose, and HbA1c were reported in the intervention group, compared with the control group, after the 12-month study period [7].

Data suggest that in general, people visit their pharmacy up to ten times more often than they visit their general practitioner [8]. In Ireland, opinion polls indicate a particularly high level of trust in pharmacists, with up to 96% of the public trusting their local pharmacist [9], and in a survey of people with diabetes attending a pharmacy, 99% of participants were satisfied with their visit to the pharmacist [10]. Therefore, pharmacists are in a prime position to join the fight against diabetes and help achieve the goals set by the Irish Health Service Executive. However, the focus of community pharmacist roles in Ireland continues to be on dispensing, with limited reimbursement opportunities for advanced services, outside of vaccination and the supply of emergency contraception [11].

All Irish community pharmacies are required to have a private consultation area [11], which is a suitable location to conduct clinical reviews and counsel patients with chronic disease such as diabetes. All people with diabetes in Ireland are supported to acquire their diabetes-related medicines though two state-funded re-imbursement schemes. Under the long-term illness scheme, medicines are dispensed free-of-charge and under the general medical services scheme medicines are dispensed for a small co-payment, currently set at a maximum of €1.50 per dispensed item [12]. However, there is no structured programme

in place for community pharmacists in Ireland to provide care to people with diabetes, outside of dispensing medications and medical devices such as glucometers.

Therefore, the aim of the study is to assess the cardiovascular risk profile of people with diabetes attending community pharmacies, to identify if there is a clinical need for a pharmacy-based diabetes care programme in Ireland, and to determine the key risk factors to be targeted in such a programme.

2. Materials and Methods

2.1. Ethical Approval

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Clinical Research Ethics Committee of the Cork Teaching Hospitals, approval number EMC 4 (n) 05/06/18. All participants received a clear explanation of the study's purposes and procedures. Written informed consent for participation was obtained from all subjects involved in the study.

2.2. Study Design

This was a descriptive, observational, cross-sectional study, examining cardiovascular risk factors among people with diabetes attending community pharmacies. Study participants were adults (aged 18 years and older), with type 1 or type 2 diabetes, who attended a participating community pharmacy and received blood-glucose-lowering medicines, insulin, or devices for monitoring glycaemic control. People aged under 18 years were excluded from the study.

2.3. Data Collection

The study was conducted in 10 community pharmacies in Ireland, selected by convenience sampling; therefore, a sampling matrix was not used. The pharmacies were in city centre, town, and suburban locations in the counties of Cork, Limerick, Tipperary, and Wexford. Data collection in each pharmacy was conducted by a pharmacy student, who was supervised by a registered pharmacist. The data-collection form for this study was based on the baseline data-collection form used in the RxEACH study, with permission of the authors [4,5]. This data included participant demographics, medical history, cardiovascular risk factors, and current medications. Data on participants' demographics, medical history, family history of premature cardiovascular disease, tobacco use, diet, and activity level were collected from participants during a visit to the pharmacy. Participants were also asked about the frequency of their contacts with other healthcare professionals for diabetes care. The researcher then measured the participant's blood pressure. For accuracy, participant medication information was collected directly from the pharmacy dispensing software. Each study visit took place in a pharmacy consultation room to ensure confidentiality. Data collection took place between June 2018 and December 2019. Data collection at each pharmacy location took place over a period of between one and seven weeks during that time. Each person attending a participating pharmacy, and meeting the inclusion criteria, during the period of data collection in that pharmacy, was invited to participate in the study.

2.4. Framingham Cardiovascular Risk Estimation

The 'Office' Framingham General Cardiovascular Disease Risk Prediction (Using Body Mass Index) was used to calculate participants' 10-year risk for atherosclerotic cardiovascular disease [13]. This tool incorporated sex, age, SBP (mmHg), treatment for hypertension (yes/no), current smoker (yes/no), diabetes (yes/no), and body mass index. The tool is valid for people aged 30–74 years and with no history of atherosclerotic cardiovascular

disease, and so only participants meeting these criteria were included in the Framingham cardiovascular risk estimation.

2.5. Achievement of Hypertension Treatment Goal

In line with the 2018 European Society of Hypertension/European Society of Cardiology (ESH/ESC) Guidelines for the management of arterial hypertension, elevated SBP was defined as SBP $\geq$ 140 mmHg and elevated DBP was defined as DBP $\geq$ 90 mmHg [14]. According to these guidelines, the anti-hypertensive treatment goal for people with diabetes was SBP $\leq$ 130 mmHg and DBP < 80 mmHg [14].

2.6. Data Analysis

Normal continuous data are presented as the mean $\pm$ standard deviation, and non-normal continuous data are presented as the median (interquartile range). Categorical data are presented as the number (%). Continuous data were compared using the independent Student's *t*-test. Categorical data were compared using the Chi-square test or Fisher exact test. The Fisher exact test was used where one cell in the test contained a count of five or less. A *p*-value of <0.05 was regarded as statistically significant. Data were analysed using IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY, USA: IBM Corp.

3. Results

One-hundred and six people with diabetes participated in the study; 70 (66.0%) were male, and 36 (34.0%) were female. The median age was 66.0 (56.5:72.0) years. Of these, 16 (15.1%) had type 1 diabetes and 90 (84.9%) had type 2 diabetes. The most frequently reported cardiovascular comorbidities were hypertension and dyslipidaemia, reported by 56.6% and 55.7% participants, respectively. This was followed by a family history of premature heart disease (37.7%), coronary artery disease (9.4%), and atrial fibrillation (8.5%) (Table 1).

Table 1. Demographic description of the population, *N* = 106 participants.

Characteristic	Number (%) or Mean ($\pm$SD)/Median (IQR)
Demographic	
Male/female	70 (66.0)/36 (34.0)
Age (years)	66.0 (56.5:72.0)
Duration of diabetes (years)	9.5 (5.0:17.0)
Medical history	
Family history of premature heart disease	40 (37.7)
Chronic kidney disease	6 (5.7)
Atrial fibrillation	9 (8.5)
Heart failure	2 (1.9)
Dyslipidaemia	59 (55.7)
Hypertension	60 (56.6)
Peripheral arterial disease	5 (4.7)
Stroke/transient ischaemic attack	5 (4.7)
Angina/coronary artery disease/coronary revascularisation	10 (9.4)
Myocardial infarction [a]	7 (6.6)
Measures	
Body mass index (kg/m^2) [b]	28.9 $\pm$ 5.3
Systolic blood pressure (mmHg)	136.4 $\pm$ 19.0
Diastolic blood pressure (mmHg)	80.8 $\pm$ 10.1
Home blood glucose measure (mmol/L) [c]	7.15 $\pm$ 2.23

[a] Data missing for *n* = 4 participants, [b] data missing for *n* = 1 participant, [c] data missing for *n* = 10 participants.

The mean SBP was 136.4 ± 19.0 mmHg, and the mean diastolic blood pressure was 80.8 ± 10.1 mmHg. Forty participants (37.7%) had an SBP ≥ 140 mmHg, and 21 participants (19.8%) had a DBP ≥ 90 mmHg.

The mean body mass index was 28.9 ± 5.3 kg/m^2. For those for whom a home measure was available, the mean home blood glucose measurement was 7.15 ± 2.23 mmol/L.

Twenty-one participants (19.8%) were current tobacco users, with 42.5% being former smokers and the remaining 37.7% having never smoked (Table 2). Most participants (85.8%) did not consume alcohol or consumed alcohol occasionally. Over half of participants followed a low-sugar diet (54.7%), with many participants following a low-salt diet (31.1%) or a diet high in fruit and vegetables (25.5%); however, 29.2% of participants followed no specific diet. While over half of participants described themselves as undertaking moderate exercise or being very active, 41.5% of participants did not undertake exercise. Most participants (69.8%) experienced no stress or mild stress.

Table 2. Lifestyle characteristics of the population, *n* = 106 participants.

Lifestyle Characteristic	Number (%)
Smoking status	
Current smoker	21 (19.8)
Former smoker	45 (42.5)
Non-smoker	40 (37.7)
Alcohol consumption	
None	38 (35.8)
Occasional	53 (50.0)
1–2 days/week	13 (12.3)
>2 days per week	2 (1.9)
Diet [a]	
No specific diet	31 (29.2)
Low-sugar diet	58 (54.7)
Low-salt diet	33 (31.1)
Low-saturated fat diet	20 (18.9)
Gluten-free diet	3 (2.8)
High fruit and vegetable diet	27 (25.5)
Other diet	26 (24.5)
Exercise [b]	
No exercise	44 (41.5)
Moderate exercise	33 (31.1)
Very active	28 (26.4)
Self-reported stress	
No stress	36 (34.0)
Mild stress	38 (35.8)
Moderate stress	23 (21.7)
High stress	9 (8.5)

[a] Adds to greater than 100% as participants could choose more than one option. Other diet included a low-potassium (dialysis) diet, low-carbohydrate diet, and high-fibre diet, amongst others. [b] Data missing for *n* = 1 participant.

There were some differences observed between participants with type 1 and type 2 diabetes. Those with type 1 diabetes were younger (48.0 [28.5:62.8] years vs. 66.0 [61:73.0] years, $p < 0.001$)) and had a longer duration of diabetes compared to those with type 2 diabetes (22.5 [14.3:38.3] years vs. 8.0 [4.5:12.3] years, $p < 0.001$). Participants with type 1 diabetes were less likely to be former smokers than those with type 2 diabetes (18.8% vs. 46.7%, $p = 0.037$). Those with type 1 diabetes had a lower mean SBP than those with type 2 diabetes (127.0 ± 15.3 mmHg vs. 138.1 ± 19.2 mmHg, $p = 0.032$) despite being less likely to be prescribed an antihypertensive medication (31.3% vs. 68.9%, $p = 0.004$). They were also less likely to be prescribed an antiplatelet agent (18.8% vs. 53.3%, $p = 0.014$). There was no difference in body mass index between those with type 1 or type 2 diabetes (27.3 ± 5.7 kg/m^2 vs. 29.2 ± 5.2 kg/m^2 $p = 0.172$).

The Framingham General Cardiovascular Disease Risk Prediction tool was appropriate for use in 71 participants, two of whom had missing data; therefore, the risk estimate was available for 69 participants. Of these, 42 participants (60.9%) had a risk of ≥30%, Figure 1. Of those participants not eligible for assessment with the Framingham tool, four were <30 years and the remaining 31 participants had a history of atherosclerotic cardiovascular disease.

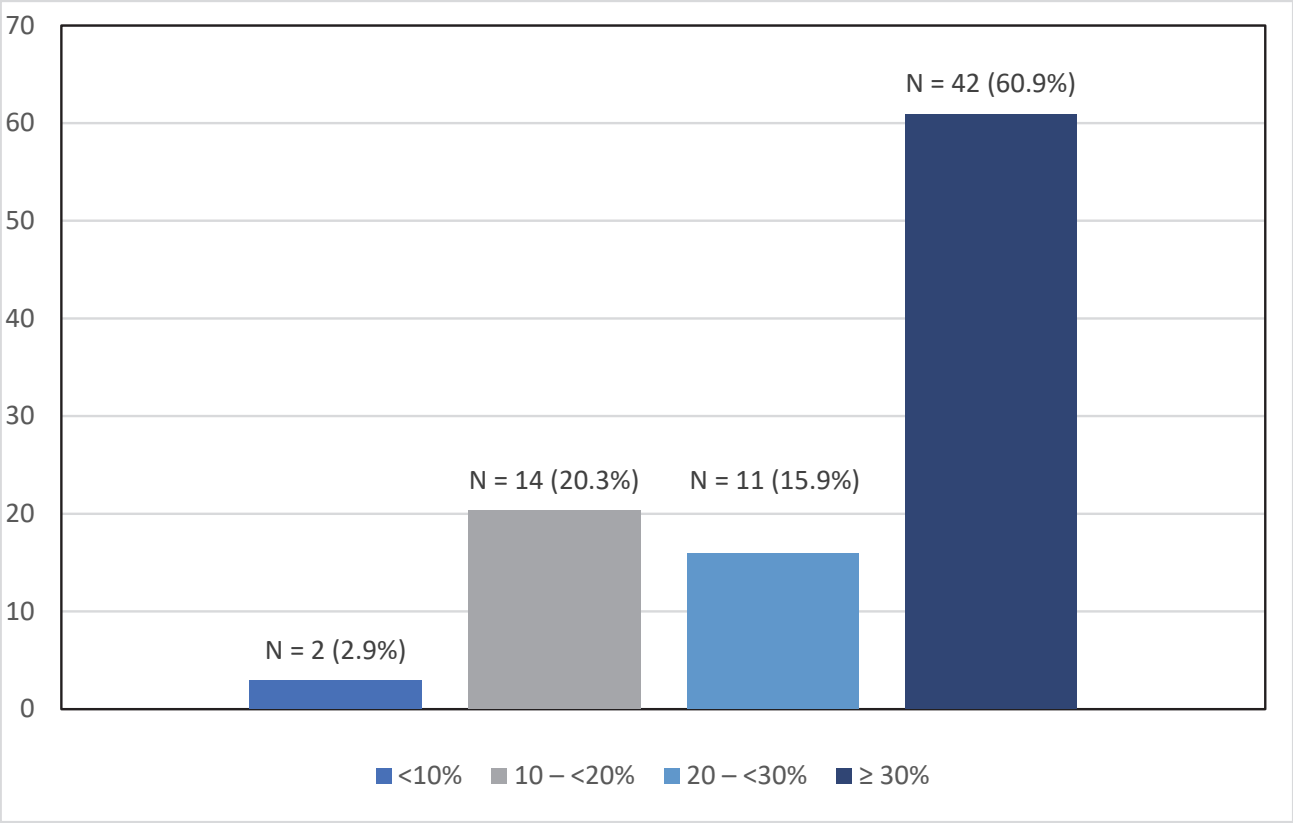

Figure 1. Application of the Framingham General Cardiovascular Disease Risk Prediction [13] tool to the eligible study population, $n = 69$. Presented as number (%) of participants categorised by % 10-year risk for atherosclerotic cardiovascular disease.

Oral diabetes medication was prescribed to 85 (80.2%) and insulin to 29 (27.4%) participants. Lipid-lowering therapy was prescribed to 77 (72.6%), antihypertensive medication to 67 (63.2%), and antiplatelet agents to 51 (48.1%) participants. Agents acting on the renin–angiotensin system were the most frequently prescribed antihypertensives, with 31 (29.2%) participants prescribed an angiotensin receptor blocker and 25 (23.6%) prescribed an ACE inhibitor. Among those prescribed an antihypertensive, 43 (40.6%) were prescribed ≥2 antihypertensive agents. A statin was prescribed to 96% of those on lipid-lowering

therapy. Nine (8.5%) participants received potentially nephrotoxic medications, with seven (6.6%) receiving non-steroidal anti-inflammatories.

Among those with an SBP $\geq$ 140 mmHg, 11 (10.4%) were not prescribed an antihypertensive medication, and among those with a DBP $\geq$ 90 mmHg, eight (7.5%) were not prescribed an antihypertensive. Where an antihypertensive was prescribed, 21 participants (19.8%) achieved the SBP on-treatment goal of $\leq$130 mmHg and 34 (32.1%) achieved the DBP on-treatment goal of <80 mmHg.

Participants reported that they received general diabetes education from their general practitioner (44.3%), their diabetes nurse (39.6%), their endocrinologist (31.1%), and other sources (28.3%). Other sources included conducting their own internet-based research and receiving information from family members. Participants reported that they received education about diabetes medicines from their general practitioner (46.2%), endocrinologist (19.8%), diabetes nurse (26.4%), pharmacist (16.0%), other source (16.0%), and dietician (2.8%). Twelve (11.3%) participants reported never receiving medication education. Most participants received diabetes diet and lifestyle education from a dietician (34.0%) or diabetes nurse (23.6%). Participants with type 1 diabetes were more likely to report receiving diabetes medication information from an endocrinologist (43.8% vs. 15.7%, $p = 0.010$) and diet and lifestyle education from an endocrinologist (31.3% vs. 10.0%, $p = 0.021$) than participants with type 2 diabetes.

All but three participants had seen their general practitioner in the previous year. However, 12 participants had not visited the diabetes clinic in the previous year, and 17 participants had never visited a diabetes clinic or diabetes nurse specialist. Thirty-three (31.1%) participants reported never having seen an endocrinologist, and 32 participants (30.2%) reported never having seen a dietician.

4. Discussion

In this study of people with diabetes attending their community pharmacy, a high proportion of participants had high rates of behaviours associated with cardiovascular risk, including smoking and lack of exercise. More than half of participants had hypertension or dyslipidaemia, with 38% of participants having SBP $\geq$ 140 mmHg and just 20% of those treated with an antihypertensive agent achieving their SBP goal of $\leq$130 mmHg. One in five participants were current smokers. Thirty percent of participants did not follow a specific diet, and over 40% did not undertake any exercise. Only 16% of participants reported receiving education about their diabetes medicines from their pharmacist. Of those participants eligible for assessment using the Framingham General Cardiovascular Disease Risk Prediction tool, 61% had a 10-year risk of atherosclerotic cardiovascular disease > 30%.

According to the Healthy Ireland Survey published in 2022, 18% of Irish adults report that they are smokers [15]. This aligns with the findings in the present study, with 19.8% of participants reporting being current tobacco smokers. However, the median age of participants was 66 years, and typically smoking rates are lower in older than in younger cohorts [16]. Smoking among people with diabetes is concerning as smoking is the risk factor most strongly associated with death among people with type 2 diabetes [17]. Pharmacists are ideally placed to provide smoking-cessation interventions to people with diabetes due to the easy access, the available pharmacy services in the local communities, and the high frequency of pharmacy visits by this cohort. Indeed, a systematic review has demonstrated that community pharmacy smoking-cessation interventions are clinically and cost effective [18].

In the present study, only 16% of participants reported that they received education about their diabetes medication from their pharmacist and 11% reported never receiving education about their diabetes medication. This is surprising as it is noticeably at variance

with the results of a previous survey of people with diabetes in Ireland, where there was strong agreement with the statement "This pharmacist told me everything about my treatment" [10]. However, in a qualitative study conducted in the UK, while people with diabetes expressed a need for information about their diabetes medicines, they were not clear about the role of pharmacists in providing this information [19]. A definition of the term education was not given to participants in the current study, and this may have influenced their response. It is possible that people attending pharmacies do not perceive informal advice or information delivered by the pharmacist as "education", and the term employed in this study, without definition, may have led to misunderstanding. Indeed, the vaguer wording used in the study by Cooney et al. [10] may better reflect participants' expectations of pharmacist-delivered education in both studies. In the context of the existing literature, and in the absence of structured diabetes care programmes in Irish pharmacies, the findings of the current study suggest that people with diabetes may not know the type of information they should expect to receive from their pharmacist about diabetes or its medicines. For future diabetes programmes to be developed for Irish pharmacies, it is essential that the type of medicine information required by people with diabetes and the format in which this should be delivered are explored.

A survey of Irish pharmacists reported that while 89% were confident in their ability to discuss oral diabetes medicines, just 57% were confident in discussing insulin treatment with people with diabetes [20]. Pharmacy educators and accreditation bodies must ensure that pharmacy programmes deliver not just knowledge but also communication and skills training to ensure that pharmacists are prepared to work in settings that deliver advanced pharmacy services and meet future healthcare needs.

In the present study, where antihypertensive agents were prescribed, just 20% of participants achieved the SBP on-treatment goal of $\leq$130 mmHg and 32% achieved the DBP on-treatment goal of <80 mmHg. A systematic review published in 2025 found that there is limited Irish data on the achievement of blood pressure goals among those treated for hypertension, identifying six studies of which only one study reported the achievement of blood pressure goals in people with diabetes [21]. In the pooled sample (random effect model), the overall proportions of people attaining a blood pressure goal of <140/90 mmHg was 56% (95% confidence interval 46%, 65%). The only study identified by Elhiny et al. as reporting blood pressure goal achievement for people with diabetes was published in 2009 and was conducted in general practice [21,22]. That study found that just 16.7% of participants with diabetes achieved the blood pressure treatment goal of 130/80 mmHg [22]. These data indicating particularly low levels of guideline goal achievement in people with diabetes treated for hypertension indicate the importance that all healthcare professionals caring for people with diabetes have in managing antihypertensive medications and identifying people who require medication review, medication up-titration, and adherence support.

The population reported here bears many similarities to the population reported in the RxEACH diabetes sub-study, where 573 people with diabetes were randomised to a pharmacist intervention or control group [4]. Al Hamarneh et al. reported that at baseline, over 80% of participants in their study had elevated blood pressure, with three-quarters of participants having uncontrolled blood pressure and over 80% of participants had dyslipidaemia, with over 50% having uncontrolled LDL cholesterol. They also reported high rates of a sedentary lifestyle and smoking [4]. Yet this Canadian study demonstrated an absolute risk reduction of 5.38 (95% confidence interval 4.24 to 6.52; $p < 0.001$) in the estimated cardiovascular risk over a 3-month period in those who received the pharmacist intervention when compared to the control group [4]. Those findings suggest that a

pharmacist intervention in a high-risk group, such as the one described in the current study, has the potential to make a significant impact on their cardiovascular risk in an Irish setting.

Over 60% of participants had a 10-year cardiovascular risk of ≥30% based on the Office Framingham General Cardiovascular Disease Risk Prediction (using the body mass index). This is particularly concerning as the Framingham tool has been reported to underestimate cardiovascular risk in people with diabetes [23]. Other cardiovascular risk tools were reviewed for use in the study but ultimately excluded. The European SCORE-2 tool does not apply to people with diabetes [24]. The QRISK3 tool was developed using data from England and is most accurate for people from the UK as it uses the UK postcode as a risk factor. QRISK3 also requires access to lipid levels [25]. The UK Prospective Diabetes Study (UKPDS) risk calculator is specific to people with type 2 diabetes and includes important risk factors such as the duration of diabetes; however, it requires input of the lipid and HbA1c level [26]. As lipid and HbA1c are typically not available to community pharmacists in Ireland, it was not possible to collect this data in the current study. Therefore, despite its limitations, the Office Framingham tool was deemed the most appropriate risk-prediction tool for this study and may be the tool most implementable in an Irish pharmacy setting.

International evidence consistently points to the benefits of community pharmacist involvement in health-promotion interventions and interventions targeted at people with diabetes. A systematic review conducted by Steed et al. demonstrated that community pharmacy health-promotion interventions may benefit health-promoting behaviours such as medication adherence, clinical outcomes such as reductions in HbA1c and cholesterol levels, and quality of life for people with chronic disease, including those with diabetes [27]. Another systematic review, by Collins et al., demonstrated that pharmacist interventions among people with diabetes are associated with a significant improvement in glycaemic control [28]. The review by Collins et al. included 14 studies, several of which reported complex interventions involving pharmacist interventions on the medication regimen, potential complications of diabetes, diet, and exercise [28]. Therefore, international evidence is favourable for pharmacist interventions. The findings of the current study aligned with that evidence, indicating that a pharmacist-led intervention targeting lifestyle behaviours and clinical outcomes in people with diabetes can make a significant clinical impact in this cohort.

This study adds to the literature as there are currently limited data on the clinical characteristics of people with diabetes attending Irish community pharmacies. The results demonstrate a high rate of characteristics associated with increased cardiovascular risk among people with diabetes in this setting. These findings suggest that the development and evaluation of a community pharmacist-led intervention addressing cardiovascular risk factors among people with diabetes warrants further investigation in Ireland. However, the present study has several limitations. Data collection was confined to a small number of pharmacies in a geographically limited area; however, there was a mix of urban, suburban, and semi-rural settings included. The provision of healthcare services to people with diabetes is relatively standardised across Ireland and is led by guidance from the Irish Health Service Executive and the National Clinical Programme for Diabetes [29]. However, as there is currently no specific guidance in Ireland on the role of pharmacists in diabetes care, it is possible that small differences might occur in the provision of care between pharmacies, and this could not be accounted for here. Patient medical history was collected based on self-report. However, Okura et al. have demonstrated that self-report is a reliable measure for estimating the prevalence of many cardiovascular diseases and diabetes [30]. Finally, the survey collected data that is readily available to a community pharmacist in Ireland and so did not have access to patient lipid or HbA1 levels. This limited the choice of cardiovascular risk assessment tools that could be applied in the population.

5. Conclusions

In this descriptive, observational study, participants demonstrated a high rate of characteristics associated with increased cardiovascular risk, including non-achievement of target blood pressure, smoking, and lack of exercise. Fewer than one in six participants reported receiving diabetes medication education from their pharmacist. Pharmacist-led interventions to improve cardiovascular risk in people with diabetes, with a focus on smoking cessation, blood pressure control, and patient education, should be developed and evaluated as potential future professional services delivered by pharmacists in Ireland.

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Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Clinical Research Ethics Committee of the Cork Teaching Hospitals, approval number EMC 4 (n) 05/06/18.

Informed Consent Statement: Informed consent for participation was obtained from all subjects involved in the study.

Data Availability Statement: The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

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Conflicts of Interest: The authors declare no conflicts of interest.

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