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# Willingness to initiate insulin among adults with type 2 diabetes in Australian primary care: Results from the Stepping Up Study

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ABSTRACT

*Aims:* To determine 'hypothetical willingness' to initiate insulin, and identify associated factors, among adults with type 2 diabetes (T2DM) in primary care for whom insulin is clinically indicated.

*Methods:* Eligible participants were adults with T2DM with an HbA1c ≥7.5% (58 mmol/mol) and prescribed maximum oral hypoglycaemic agents. A total of 261 participants were recruited from 74 Victorian general practices: mean age 62 ± 10 years; 39% ($n$ = 103) women; diabetes duration 10 ± 6 years; HbA1c 9.0 ± 1.3% (75 ± 14 mmol/mol). Data collected by the Stepping Up Study: demographic and clinical characteristics, 'willingness' to initiate insulin, insulin appraisals, depressive symptoms, and diabetes-related distress. A multinomial regression investigated predictors of 'willingness'.

*Results:* Nineteen percent ($n$ = 50) were 'very willing' to initiate insulin, if recommended. The final regression model ($R^2$ = .44, $\chi^2(12)$ 145.91, $p < .001$) demonstrated higher socioeconomic status and less negative attitudes to insulin were associated with increased willingness to initiate insulin.

*Conclusions:* Among adults with T2DM for whom insulin is clinically indicated, only one in five are 'very willing' to begin insulin therapy. Independent of demographics, clinical factors and emotional wellbeing, insulin appraisals were associated with 'willingness'. This study highlights the importance of addressing attitudinal barriers to insulin therapy among adults with T2DM in primary care to improve insulin receptiveness.



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## 1. Introduction

Due to the depletion of beta cell function over time [1], type 2 diabetes mellitus (T2DM) requires timely intensification of treatment throughout disease progression [2]. Insulin therapy is the most effective glucose lowering treatment option available [3,4] but is often delayed [5]. This may be due to a reluctance by health professionals, known as clinical inertia [6], or reluctance among people with T2DM, known as 'psychological insulin resistance' [7–9].

In the UK Prospective Diabetes Study, 27% of the participants for whom insulin was prescribed initially refused this form of therapy, while just 7–13% refused intensification of tablet treatment [10]. In a qualitative study in a UK Bangladeshi population, one in five participants refused insulin, even after attending counselling about treatment intensification [11]. There has since been little research on the refusal of insulin among people with T2DM, and refusal rates are largely unknown.

Several studies have explored the behavioural concept of 'hypothetical willingness' to begin insulin therapy if recommended, where being hypothetically unwilling is regarded as a proxy of insulin refusal [12–19]. Approximately 17% of adults with non-insulin-treated T2DM report being hypothetically unwilling to begin insulin, although rates vary across countries [18] and cultural groups [13]. Exploring, and intervening at the level of, insulin appraisals (or attitudes) may be critical in understanding and improving receptiveness toward insulin therapy uptake. Attitudes have been investigated widely using both quantitative [20] and qualitative methods [21].

Despite attitudes being strong predictors of intention [22], little research has investigated the relationship between attitudes towards insulin and hypothetical willingness appropriately. In two previous studies using a validated measure of insulin appraisals, the regression model included attitudes towards insulin as the dependent variable, with hypothetical willingness and other psychosocial variables as predictors [14,19]. This is in contrast to the more logical and theoretically-grounded expectation that attitudes (insulin appraisals) would be predictive of intention (willingness) and behaviour (insulin uptake) [22]. Thus, a more suitable approach is to explore the role of attitudes, and associated factors, in the prediction of hypothetical willingness. In other studies, unvalidated or single item assessments of insulin appraisals have been used [13,16,18]. Further research using validated measures to corroborate these findings.

In research exploring attitudes or willingness to initiate insulin, few studies have explored the role of other psychosocial variables (e.g. emotional wellbeing) and/or behavioural factors (e.g. current medication-taking behaviours), in addition to clinical factors (e.g. glycaemic levels). Diabetes-related distress has been shown to be an important underlying predictor of insulin appraisals [23,24]. However, willingness to initiate insulin was not explored in these studies and objective clinical data were limited. Where the relationship between emotional wellbeing and willingness to initiate insulin has been explored, depressive symptomatology, rather than diabetes-related distress, has been measured [14,19], or unvalidated measures have been used [16]. In summary, a comprehensive analysis is needed of the clinical and psychosocial factors (using validated measures) associated with willingness to begin insulin to guide clinical practice.

Our aims were to: (1) to determine hypothetical willingness to initiate insulin therapy among adults with T2DM for whom insulin is clinically indicated, who receive their diabetes healthcare in general practice, and (2) to identify demographic, clinical and psychosocial factors, including attitudes toward insulin therapy, associated with hypothetical willingness to begin insulin.

## 2. Participants, materials and methods

Baseline data were collected from adults with T2DM participating in the Stepping Up Study, a cluster randomised trial conducted in 74 general practices across the state of Victoria, Australia. A detailed description of the trial protocol has been published elsewhere [25]. A cross sectional analysis of baseline data collected between October 2012 and June 2014 was undertaken.

Ethical approval was received from the University of Melbourne Health Sciences Human Research Ethics Subcommittee (ID 123740) and Deakin University Human Research Ethics Committee (2012-108). The trial is registered with the Australian New Zealand Clinical Trial Registry (ACTRN12612001028897).

### 2.1. *Participants*

Eligible practices were recruited through Medicare Locals (local networks of general practices) and the University of Melbourne Department of General Practice database of teaching and research active practices. Of the 74 participating practices, 77.0% ($n = 57$) were privately owned; the median (IQR) number of registered patients with a recorded diagnosis of T2DM was 233 (131, 349), and 37.8% ($n = 28$) were located outside the metropolitan area. Eligible patients were adults with non-insulin-using T2DM, an HbA1c $\geq$7.5% (58 mmol/mol) in the past 6 months and for whom maximal oral therapy ($\geq$2 oral hypoglycaemic agents (OHAs) at maximum tolerated doses) had been prescribed or for whom the GP considered insulin initiation appropriate. Patients were ineligible if they were >80 years of age, unable to give consent, had unstable cardiovascular disease, and/or an existing debilitating medical condition.

Potentially eligible patients ($N = 521$) were identified by the practice and sent a letter stating that study participants may benefit from assessment and more intensive diabetes management (which *may* include insulin therapy) and inviting the person to attend the practice to learn more about the study. 422 participants responded to this invitation. Upon consent, participants completed the baseline questionnaire and undertook an HbA1c test. Those with HbA1c <7.5% (58 mmol/mol), were excluded. Following screening, the eligible participating Stepping Up sample included 51% ($n = 266$) of the potential population.