

FROM CONCEPT TO CONFIRMATION: A METHODOLOGICAL JOURNEY IN DEVELOPING A DIABETES BEHAVIOURAL DIAGNOSIS INSTRUMENT

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Background

Diabetes management is strongly influenced by patient behaviours, including lifestyle choices, adherence to treatment, and psychological wellbeing (CDC,2023). In Malaysia’s multi-ethnic and multilingual context, these behaviours are further shaped by diverse cultural beliefs and practices (ADA,2021) However, there is a noticeable gap in validated behavioural assessment instruments that are culturally appropriate for diabetes care (Chiou et al. 2023). Despite the significant impact of psychosocial and behavioural factors on diabetes outcomes, the availability of culturally tailored tools to assess these dimensions remains limited (Kim et. al. 2029; ADA, 2025).

Aim

This paper aims to describe a method of collecting data, develop and validate a reliable instrument to assess psychosocial and behavioural aspects among patients with type 2 diabetes mellitus (T2DM) in Malaysia.

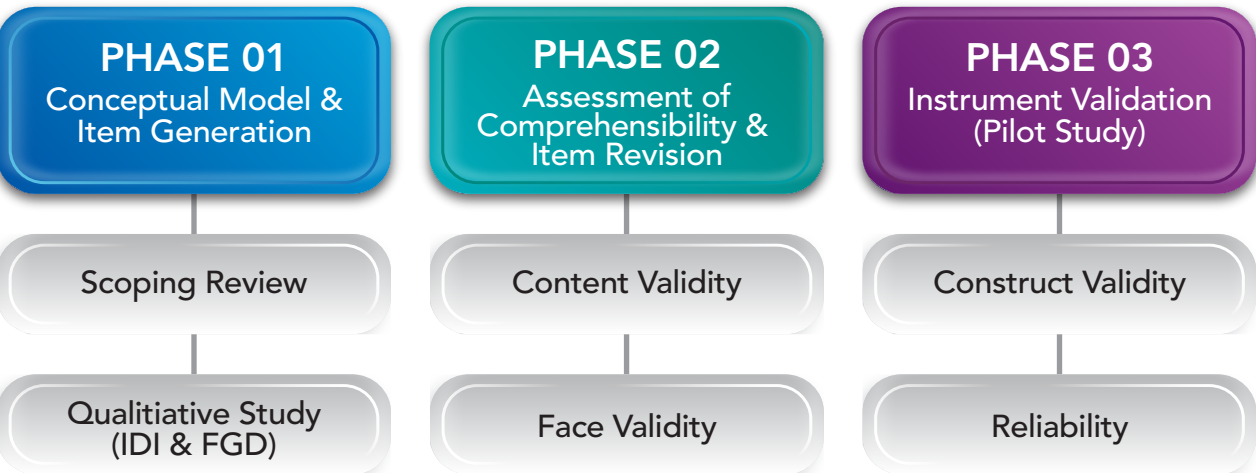
Methodology

The study was conducted in three phases.

Phase 1 involved preliminary item generation through literature review, in-depth interviews with patients (IDIs), and focus group discussions (FGDs) with healthcare professionals.

Phase 2, content and face validity were evaluated by subject matter experts (SMEs) and a Type 2 Diabetes Mellitus (T2DM) patients.

Phase 3 included a pre-test and pilot study to assess the instrument’s reliability and usability.



The study progressed through three distinct phases:

Phase 1: Item Generation

Methodology: Involved a thorough literature review, in-depth interviews (IDI) with patients, and focus group discussions (FGD) with healthcare professionals.

Outcome: A total of 250 initial items were gathered. These items were then classified into three core constructs (information, motivation, and behavior) based on the IMB model.

Phase 2: Validity Evaluation

Methodology: Content and face validity were assessed by five subject matter experts (SMEs) and 30 T2DM patients.

Phase 3: Reliability & Usability Testing

Methodology: Included a pre-test (n=201) and a pilot study (n=222) to evaluate the instrument's reliability and usability. The pilot test for construct validity involved 201 patients from the Klang District.

Key Results

The instrument demonstrated strong psychometric properties:

▶ **Construct Validity:** Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) revealed clear factor structures for each domain: **two factors for information, four for motivation, and six for behavior/practice.**

▶ **Content Validity:** The final instrument showed **strong content validity**, with experts confirming item clarity and relevance.

▶ **Internal Consistency:** Reliability was high across domains, with Cronbach's alpha values ranging from **0.562 to 0.876.**

▶ **Refinement:** Four low-loading items (below 0.60) were removed after CFA to enhance the instrument's psychometric strength.

In essence, a comprehensive, multi-phase approach was used to develop and rigorously validate a new instrument, resulting in a reliable and well-structured tool with strong psychometric properties.

Discussion & Conclusion:

This study successfully developed and validated the Diabetes Behavioural Diagnosis Instrument (DBDI), a new tool for assessing psychosocial and behavioural factors in diabetes self-management in Malaysia.

Initially, researchers used qualitative methods, including in-depth interviews (IDIs) with patients and focus group discussions (FGDs) with healthcare providers. This helped them thoroughly understand the complex thoughts, feelings, and perceptions influencing Type 2 Diabetes behaviours.

All themes identified were integrated into the Information-Motivation-Behavioural (IMB) framework, which then guided the development of the instrument's items. The DBDI consists of three domains:

- Information (24 items)
- Motivation (21 items)
- Behavioural (29 items)

An exploratory factor analysis conducted on 201 samples showed strong internal consistency across all domains. However, 18 items from the Information domain were removed due to low factor loadings, likely because participants found some technical terms difficult to understand.

Despite initial plans for a nationwide study, the COVID-19 pandemic and related restrictions posed logistical challenges, limiting the study's reach.

Ultimately, the DBDI is a valid and reliable tool that can be used by healthcare professionals in the field. It's designed to diagnose T2DM patients' behavioral patterns and help healthcare providers plan tailored interventions for better diabetes self-management. Future research will focus on testing the instrument's broader applicability.

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