How do health care professionals assess patients when initiating insulin therapy? A qualitative study

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\begin{abstract}
Aims: To explore how health care professionals (HCPs) assess patients when initiating insulin therapy in type 2 diabetes.
Methods: Focus group discussions and in-depth interviews were conducted with 41 health care professionals in Malaysia in 2010–2011. A semi-structured topic guide was used for the interview. The interviews were transcribed verbatim and analysed using the Nvivo9 software based on a thematic approach.
Results: HCPs were less likely to initiate insulin therapy in patients who were older, with irregular dietary patterns and poor financial status. They also assessed patients’ knowledge, views and misconceptions of insulin. However, there was a variation in how doctors assessed patients’ comorbidities before starting insulin therapy. Medical officers were more likely to initiate insulin therapy in patients with comorbidities and complications, whereas family medicine specialists were more cautious. In addition, most HCPs considered patients’ psychosocial status, including self-care ability, social support and quality of life.
Conclusions: HCPs’ assessment of patients’ need to start insulin therapy depends on their perception rather than objective evaluation of patients’ background, knowledge, perception and abilities. The background and the type of practice of HCPs influence their assessment.
\end{abstract}

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1. Introduction

The United Kingdom Prospective Diabetes Study (UKPDS) has confirmed that intensification of glycaemic control prevents and delays both microvascular and macrovascular complications of type 2 diabetes [1,2]. However, few recent multicentre trials reported that intensive glycaemic control may actually cause more harm than benefit, especially in older patients with complications and comorbidities [3–5]. These recently conducted trials show that glycaemic control target should be individualised [6]. Choosing a specific HbA1c target range for a patient requires the clinician to take into consideration several factors such as age, comorbid conditions, psychological status, capacity for self-care, economic considerations, quality of life and family and social support systems [6].
Most of the clinical practice guidelines on type 2 diabetes mellitus recommend that insulin therapy should be initiated in patients who have poor glycaemic control despite taking maximum oral glucose-lowering drugs [7,8]. However, as many factors influence the decision of initiating insulin therapy, assessment of patients’ profile by health care professionals (HCPs) is crucial in determining whether insulin therapy should be initiated. Furthermore, discrepancies do exist between guideline recommendations and actual practice of HCPs [9,10], and doctors consider different factors when advising patients with type 2 diabetes about the treatment choice [11]. This study, therefore, intended to explore how does HCPs assess patients when initiating insulin therapy in type 2 diabetes.

Malaysia is a multi-cultural society, consisting of three main ethnic groups (Malays, Chinese and Indians) and many other smaller ethnic groups [12]. Diabetes is becoming more prevalent in Malaysia, as the National Health and Morbidity Survey (NHMS) 2011 reported the prevalence of 20.8% for adults aged 30 years and above compared to 14.9% in the NHMS 2006 [13,14]. Insulin therapy initiation is often delayed as the NHMS showed a low insulin usage rate [15]. In Malaysia, insulin therapy is initiated by doctors at either primary or secondary care settings. Most private general practitioners and medical officers in primary care settings are generalists without further training after basic medical degree, whereas endocrinologists and family medicine specialists undergo structured training in the management of chronic diseases. Malaysia has a dual-sector health care system comprising public (government subsidised) and private (fee for service) sectors [15]. The factors that influence the HCPs’ decision of insulin therapy initiation may differ in different settings.

2. Methods

2.1. Design

Semi-structured interviews and focus group discussions were conducted to explore how does HCPs assess and make the decision of insulin therapy initiation among patients with type 2 diabetes. A qualitative methodology was chosen, as it enabled us to explore a range of views and practices of HCPs in this clinical context [16-18].

2.2. Setting

This study was conducted in three different settings: government hospitals and health clinics; university-based hospitals and primary care clinics; private hospitals and general practice clinics. HCPs from both urban and semi-rural locations were recruited. Key policy makers who were involved in the development and implementation of the national diabetes strategic plan of government were also included.

2.3. Participants, recruitment and sampling

Purposive sampling was used to identify the stakeholders who were involved in insulin therapy initiation. A ‘snowballing’ technique was used to recruit participants by asking stakeholders to identify individuals and organisations involved in insulin therapy initiation. Interviews and analyses were performed in an iterative manner until no new themes emerged. Recruitment was stopped when researchers agreed that the analysis had reached thematic saturation.

2.4. Data collection

An interview topic guide was developed based on literature review, expert opinion and a conceptual framework where HCPs, patients and health care delivery systems are factors that may influence the decision of initiating insulin therapy [19]. To ensure homogeneity and to capitalise on shared experiences among the HCPs [20], the grouping of the focus group discussions were done according to the HCPs’ practice background and location. Individual in-depth interviews were conducted with policy-makers for logistic reasons. We interviewed the HCPs using open-ended questions and used prompts only if important issues did not emerge spontaneously during the interview. The HCPs were informed that the interview focuses on patients with type 2 diabetes, who required insulin based on their clinical assessment. The HCPs were asked about the barriers, facilitators and their experience in insulin therapy initiation as well as their strategies to optimise insulin initiation. These findings are reported elsewhere [21,22]. They were also asked to discuss on how they assessed patients and made decisions of initiating insulin therapy, and this is the main focus of this paper.

Between October 2010 and May 2011, individual interviews and focus group discussions (each lasting between 30 and 60 min) were conducted. Participants were informed of the anonymity and confidentiality of the interview and written consent for the interviews and audio-recording was obtained. Three trained researchers conducted individual interviews and focus groups discussions using the topic guide. Field notes on non-verbal cues and interview dynamics were taken by an assistant. The in-depth interviews, focus group discussions and field notes served to triangulate the data. Data saturation was reached after 10 individual interviews and four focus group discussions. All the interviews were audio-recorded, transcribed verbatim and transcripts were used as data for analysis.

2.5. Data analysis

Data were analysed using a thematic analysis approach. Themes were derived inductively from the data. Three researchers coded two transcripts (interviews with a primary care physician and a government policy-maker) independently and a list of free nodes (themes) was created. Subsequently, the free nodes were merged to form larger categories. An example of the coding process of the data is illustrated in Table 1. The larger framework, consisting of categories and themes, was used subsequently to code (label) another two transcripts by the researchers independently. The coding was then compared for inter-rater consistency and any discrepancies were resolved by discussion with the attempt to reach a consensus. In the event of disagreement, an independent researcher (who did not participate in the analysis) would be asked to analyse the data separately. However,
disagreement did not arise in this study. Consensus was reached on the final list of nodes and their descriptions. This final list of revised nodes was imported into the Nvivo9 software and served as the framework for coding the rest of the transcripts. During coding, new themes that emerged were added to the list upon consultation with the research team. All the quotes were screened and those that best captured the essence of the themes were extracted.

As two of the researchers were family physicians (LPY and NCJ), the researchers were conscious of their personal and professional views on insulin therapy initiation. The team underwent constant reflection and open discussion throughout the interviews and analysis to reduce possible biases. This study was part of a larger 3-year study that aimed to develop a patient decision aid for people with type 2 diabetes who are considering insulin therapy.

2.6. Ethics approval

This study received ethics approval from the University of Malaya Medical Centre Medical Ethics Committee and the Medical Research and Ethics Committee of the Ministry of Health, Malaysia.

3. Results

A total of 41 HCPs participated in the study. The demographic profile of the participants are summarised in Table 2.

The HCPs were aware of the indications for insulin therapy based on the clinical practice guideline for diabetes. Most of the HCPs would consider starting insulin therapy for patients with type 2 diabetes if their glycaemic control remained poor despite taking two or more oral hypoglycaemic agents. In patients with newly diagnosed diabetes, few HCPs would also consider starting insulin with an oral antidiabetic agent if the Hba1c was more than 9% (75 mmol/mol) or significant symptoms of diabetes. The HCPs also considered a range of factors when assessing patients’ eligibility for insulin therapy and these factors included patients’ sociodemography, lifestyle, knowledge about insulin, attitudes towards insulin, comorbidities, complications and psychosocial status as summarised in Table 3. The assessment also varied according to where the HCPs worked (private vs. public sectors).

### Table 1 – An example of the coding process of the transcript.

<table>
<thead>
<tr>
<th>Line-by-line coding</th>
<th>Free nodes (themes)</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erm, for me, I have to look at the patient individually. What is the patient's background?</td>
<td>Individualised assessment</td>
<td>Approach to patient’s assessment</td>
</tr>
<tr>
<td>What is the occupation?</td>
<td>Occupation</td>
<td>Patient's sociodemographic background</td>
</tr>
<tr>
<td>And then before starting insulin, I have to ask the dietary habit and all that.</td>
<td>Diet pattern</td>
<td>Patient's lifestyle</td>
</tr>
<tr>
<td>Like, for example, the patient is a lorry driver. You’ll need all the information before speaking to the patient.</td>
<td>Occupation</td>
<td>Patient’s sociodemographic background</td>
</tr>
</tbody>
</table>

3.1. Age

Age was a main factor when considering insulin therapy initiation. Most HCPs were hesitant to initiate insulin therapy in older people, as they were worried about the side effects of insulin, such as hypoglycaemia, which are more likely to occur in the elderly.

“Generally age is a criteria, the reason why you shouldn’t push in old people is that, lots of studies in the last 2, 3 years have shown that pushing it will lead to increased mortality.” Private Endocrinologist

3.2. Dietary pattern

The HCPs also considered patients’ occupation when deciding on insulin therapy initiation. Patients who were likely to have irregular dietary patterns as a result of their work such as public transport driver will find it inconvenient to use injection and were considered unsuitable for insulin therapy.

“A lot of them are scared of injection. Especially taxi drivers, they can’t find proper timing. They find the timing is very, chaotic, their sleep timing, their eating timing. It’s difficult for them to coordinate.” Government Medical officer

3.3. Financial status

The HCPs in the private sector would consider patients’ financial status when making a decision about insulin therapy initiation, whereas this was not a concern for the HCPs in the public sector.

“Going back to financial, it’s not really the cost of the insulin, but also the testing strips, the needle, the glucometer, the lancets, and the swabs… most companies pay for insulin, but they don’t pay for all these strips and all this… It’s expensive.” Private General Practitioner

“We’ve been quite good in being able to put patients on insulin and we are lucky here because we get support from the glucose monitoring or meter companies, where they provide us this free glucometer scheme! Free! …that works.” Government Endocrinologist
Table 2 – Demographic profile of participants.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number (n = 41)</th>
<th>%</th>
<th>Mean ± SD (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>46.6 ± 9.8 years (30–66 years)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>31</td>
<td>75.6</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>24.4</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malays</td>
<td>15</td>
<td>36.6</td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>10</td>
<td>24.4</td>
<td></td>
</tr>
<tr>
<td>Indians</td>
<td>13</td>
<td>31.7</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>Professional background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General practitioner</td>
<td>12</td>
<td>29.3</td>
<td></td>
</tr>
<tr>
<td>Family medicine specialist</td>
<td>10</td>
<td>24.4</td>
<td></td>
</tr>
<tr>
<td>Medical officer</td>
<td>8</td>
<td>19.5</td>
<td></td>
</tr>
<tr>
<td>Government policy maker</td>
<td>5</td>
<td>12.2</td>
<td></td>
</tr>
<tr>
<td>Diabetes nurse educators</td>
<td>3</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>Endocrinologists</td>
<td>2</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>Pharmacist</td>
<td>1</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>Healthcare sector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>26</td>
<td>63.4</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>15</td>
<td>36.6</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 – Factors influencing HCPs’ decision of initiating insulin therapy in patients with type 2 diabetes.

<table>
<thead>
<tr>
<th>Factors</th>
<th>More likely to initiate insulin</th>
<th>Less likely to initiate insulin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Younger</td>
<td>Older</td>
</tr>
<tr>
<td>Dietary pattern</td>
<td>Regular</td>
<td>Irregular</td>
</tr>
<tr>
<td>Financial status</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Knowledge about insulin</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td>Views towards insulin</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Comorbidities and complications</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Self-care</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td>Social support</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td>Quality of life</td>
<td>Good</td>
<td>Poor</td>
</tr>
</tbody>
</table>

3.4. Knowledge about insulin

Most HCPs stated that lower education level and patients’ lack of knowledge of insulin and diabetes would delay insulin therapy initiation, as it takes more time to educate them and to dispel their misconceptions.

“I think the problem with our diabetes patients is firstly, a lot of them they get prior information from someone else which may not be correct. And then this has been seeped inside their brain. When they first come to you, you have to settle with all these myths first. If you don’t settle all these myths first, usually they are either a frequent defaulters, or when it comes to insulin, they reject.” Government Medical Officer

3.5. Patients’ views about insulin

The HCPs considered patients’ views on insulin therapy initiation, in particular their fears and concerns. Patients who had positive views about insulin were more likely to be started on insulin therapy earlier.

“Which is here, positive patient. So they already understand the importance, so then I will proceed the timing with the techniques thing (insulin injection techniques). So if the negative patient, they refuse or they are still not sure whether they will do like that (inject insulin), so we try to find out what is the cause, if normally they said – fear needles. Then we try to let them experience and they said no pain so they are still not sure, pen is something new, pricking themselves something new, so they need a support. So I make appointment with the relatives because no use forcing them.” Government Diabetes Educator Nurse

3.6. Comorbidities and complications

Some of the non-specialist HCPs were more likely to consider starting insulin therapy in patients with comorbidities, obesity or multiple complications. On the other hand, specialist HCPs stated that they would weigh the risks and the benefits of tight glycaemic control before insulin therapy initiation. Some suggested that the threshold of starting insulin therapy is higher in patients with complications such as kidney problems.

“It depends on their comorbidities as well. Like patients with chronic disease (comorbidities), we can’t give OHA (Oral hypoglycaemic agents), so we have to give insulin.” Government Medical Officer

“If they are already on maximum (oral medication), even if they’re 7.5% (HbA1c) also, we will start (insulin). But of course you have to weigh the risk and balance. Patient with already with comorbidity, like having severe..."
congestive heart failure, or very bad uncontrolled kidney problems and all that. So, your target will be slightly a bit higher, probably. Not to 6.5% (HbA1c). Maybe around 7.0% (HbA1c), 7.5% (HbA1c).” Government Family Medicine Specialist

3.7. Self-care ability

The ability of patients to perform self-care is an important factor that influences HCPs’ decision of initiating insulin therapy. HCPs were more reluctant to start insulin therapy in patients who might have difficulty administering insulin themselves, for example, the elderly and those with poor vision.

“Sometimes the problem is they have to depend on somebody else to administer (insulin) for them. Some might not be literate enough to do it by themselves. The fact that they have to depend on somebody else, one thing due to poor literacy, number 2 due to poor eye vision. They can’t read the units.” Private General Practitioner

3.8. Support systems

Some HCPs assessed patients’ family and social support before initiating insulin therapy. They were concerned that patients, especially the elderly who lived alone, might develop side effects such as hypoglycaemic attack.

“There’s this woman who comes from BatuPahat. Poorly controlled. And the son says “Doc, she stays all alone in BatuPahat, I think dangerous you put her on insulin, in case of hypo”. And, it’s fair enough. She was alone in BatuPahat, so I mean definitely I won’t push her to have insulin yeah, in case she gets hypo.” Private Endocrinologist

3.9. Quality of life

The HCPs considered the health status and the quality of life of patients when assessing their need for insulin. The patients with good quality of life were considered more likely to live longer and would, therefore, benefit from tighter glycaemic control by initiating insulin therapy.

“Say this guy is seventy years old. He plays golf every other day, swims every other day, you know, looks trim and fit. He’s got the body of a 50 or 60 year old, so these are the people I’d push harder.” Private Endocrinologist

4. Discussion

The HCPs considered a range of factors when assessing patients’ eligibility for insulin therapy. These included patients’ socio-demography, lifestyle, knowledge and attitudes towards insulin, comorbidities, complications and psychosocial status. This is consistent with the recommendations made by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Both bodies proposed that glycaemic control should be individualised, and patient’s attitude, potential risk of hypoglycaemia, duration of disease, comorbidities, complications and life expectancy are elements used to determine efforts to achieve glycaemic target [6,23]. In addition, the decisions on the intensity of glycaemic control should be made in conjunction with the patient, and it should reflect patient’s preferences, needs and values [23]. In the US and Canada, doctors were more likely to consider qualitative factors (e.g., adherence, motivation and overall health assessment) rather than quantitative factors (e.g., A1C, age and weight) when advising patients about the choice of treatment for type 2 diabetes, and for insulin initiation, blood glucose control and comorbid conditions were the main considerations [11]. In a study by Lufsey et al., physicians in the UK and USA used patients’ demographic characteristics for initial assessments. Detailed assessments about cognitive ability, motivation, social support and factors that predict adherence with medical recommendations were the main elements that were considered in treatment decisions [24]. This is similar to what we found in our study.

Due to the worry of hypoglycaemia risk, HCPs were more reluctant to initiate insulin therapy in patients with irregular dietary pattern. However, the HCPs could consider other options, such as insulin analogues and GLP-1-receptor agonists, which pose a lower risk of hypoglycaemia [25,26]. Though, the cost factor may need to be taken into consideration, particularly for patients who are followed up at the fee-for-service private sector. In government primary care clinics, insulin analogues and GLP-1-receptor agonists are not available.

The HCPs in the private sector considered patients’ financial status when making a decision about insulin therapy initiation, whereas this was not a main concern in the public sector. This is unique in Malaysia, as in the dual health care system, patients on follow-up in government clinics may be given free glucometers and subsidy of glucose test strips, whereas those on follow-up in the private sector often need to pay for these tools. The cost constraint prevents many patients from self-monitoring and optimising their diabetes control [6,27]. This may explain why patients with type 2 diabetes from the lower socio-economic group were noted to have higher mortality rates [28].

Knowledge and attitude of patients play an important role in influencing the acceptability of insulin therapy. In this study, the participants highlighted that patients with poor knowledge and negative views about insulin would be less likely to be started on insulin, as more time was needed to educate and counsel them. Pace et al. found that limited knowledge about diabetes, its causes and symptoms affected the prevention of diabetes-related complications [29]. Patients’ negative views and beliefs regarding diabetes and treatment contribute to their reluctance to initiate insulin therapy [19,21,30–32]. Some GPs from this study stated that they would be more likely to start insulin therapy in patients with comorbidities and complications. The family medicine specialists, on the other hand, would set the glycaemic target higher for patients with comorbidities and complications. The current recommendations advocate less stringent glycaemic control in the presence of comorbid conditions in diabetes [6,23]. Our study indicates that HCPs, especially those who are non-specialists, may need to be educated on the current recommendations.
This study included views and experiences of HCPs who were involved in diabetes care from all levels of training. We captured the views of HCPs from the dual-sector health system, that is, both the private and government sectors. This allowed comparison of the views of HCPs from the two different sectors. However, as the study was conducted in urban and semi-rural areas, caution should be exercised in extrapolating the results to the general views of all HCPs. Future research should compare to what extent these factors influence the decision-making of insulin therapy initiation between generalists and specialists. In addition, patient assessment tools that help stratify patients according to their clinical and social profiles can be developed and incorporated into the clinical decision support system to assist healthcare professionals in making decisions about initiating insulin for patients. Finally, strategies should be developed to guide patients in weighing the risk and benefit of glycaemic intensification and insulin therapy initiation.

5. Conclusion

In this study, HCPs considered patients’ socio-demography, lifestyle, knowledge, comorbidities, complications, views towards insulin and psychosocial status as recommended by the American Diabetes Association and the European Association for the Study of Diabetes before initiating insulin therapy [23]. However, HCPs’ assessment of patients’ need to start insulin depends on their perception rather than objective evaluation of patients’ background, knowledge, perception and abilities. The background and the type of practice of HCPs influence their assessment. Therefore, an educational programme is required to educate especially the non-specialist HCPs in the country on the current recommendation of individualising glycaemic targets [6,23].

Conflict of interest

The authors have no conflicts of interest to declare.

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