

## A Scottish and Japanese experience of patient-centred diabetic care: descriptive study of interprofessional education on live webinar

Mina Suematsu<sup>1</sup>, Sundari Joseph<sup>2</sup>, Keiko Abe<sup>3</sup>, Hiroki Yasui<sup>4</sup>, Noriyuki Takahashi<sup>1</sup>, Kentaro Okazaki<sup>1</sup>, Jenni Haxton<sup>5</sup>, Morag McFadyen<sup>6</sup>, Patrick Walker<sup>7</sup>, and Lesley Diack<sup>6</sup>

<sup>1</sup>*Department of Education for Community-Oriented Medicine, Nagoya University Graduate School of Medicine, Nagoya, Japan.*

<sup>2</sup>*School of Nursing & Midwifery, Robert Gordon University, Aberdeen, UK*

<sup>3</sup>*Nursing Career Support Office, Nagoya University Hospital, Nagoya, Japan*

<sup>4</sup>*Department of Respiratory, Bihoro municipal national health insurance hospital, Bihoro, Japan*

<sup>5</sup>*Aberdeen Royal Infirmary, Aberdeen, UK*

<sup>6</sup>*School of Pharmacy and Life Sciences, Robert Gordon University, Aberdeen, UK*

<sup>7</sup>*School of Applied Social Studies, Robert Gordon University, Aberdeen, UK*

### ABSTRACT

To minimise the global burden of diabetes, the awareness of appropriate intervention methods for diabetes education and practice is essential. This project is the first international interprofessional education (IPE) for the awareness of diabetes, with a focus on patient-centred care wherein three medical and four pharmacy students from Japan and one medical, two pharmacy, two nutrition and one occupational therapy (OT) student from Scotland participated. We described IPE effects using interdisciplinary education perception scale (IEPS) before and after the programme among Scottish and Japanese students. University of Aberdeen/ Robert Gordon University and Nagoya University developed and established a shared online platform that provided knowledge to students on diabetes in both languages. We developed a case-based scenario that reflected diabetes care in each country using a standardised patient (SP). Lastly, a student-led live webinar was conducted on 14 November 2014 (the World Diabetes Day) to discuss and exchange care methods for SP. Each participating national team presented their care plan and all students discussed the diabetic care plan online. Both Japanese and Scottish teams were able to accurately assess the patient's condition and empathise with the SP. In conclusion, all participants learned that interprofessional collaboration was clearly required for diabetes management focused on patient-centred care. All participants appreciated the differences in the approach of the two countries involved because of the cultural- and health related differences. This programme was significant in raising awareness regarding the need for international interprofessional intervention on diabetes towards developing a model for live webinar IPE.

**Keywords:** patient-centred care, interprofessional education (IPE), international interprofessional education (IPE), World Diabetes Day, live webinar IPE

This is an Open Access article distributed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view the details of this license, please visit (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

---

Received: August 9, 2017; accepted: April 17, 2018

Corresponding Author: Mina Suematsu, MD, PhD

Department of Education for Community-Oriented Medicine, Nagoya University Graduate School of Medicine, 901(9th Floor), Medical Science Research Building 3, 65 Tsurumai-cho, Showa-ku, Nagoya, 466-8560, JAPAN

E-mail: [minasue37@med.nagoya-u.ac.jp](mailto:minasue37@med.nagoya-u.ac.jp)

## INTRODUCTION

The number of people afflicted with diabetes is increasing across the globe. In 2015, a total of 415 million adults had diabetes and this number is expected to increase to approximately 642 million or one in every 10 adults by 2040.<sup>1)</sup> Approximately 12% of the total global expenditure on health is currently spent on adults with diabetes.<sup>1)</sup> For decreasing the medical expenditure associated with diabetes, the most important aspect is the awareness of global intervention on diabetes. Following the announcement by the American Diabetes Association (ADA)-European Association for the Study of Diabetes (EASD) consensus in 2012,<sup>2)</sup> patient-centred care has gained focus across the world. Japan has changed the guidelines of goals and strategies for diabetes management and has encouraged diabetes self-management education through multidisciplinary teams.<sup>3)</sup> The focus has now changed to multidisciplinary teams that can together achieve and maintain effective and favourable metabolic control for the prevention of development and progression of diabetic complications.<sup>4,5)</sup> This multidisciplinary team approach constitutes a variety of healthcare professionals such as nurses, dieticians, pharmacists, clinical laboratory technicians, physical therapists, clinical psychologists (if available), social workers and physicians. The World Health Organization (WHO) declared that interprofessional education (IPE) is valuable to accomplish the patient-centred care,<sup>6)</sup> asking for healthcare workers from different professions to learn from each other towards developing a more comprehensive care plan for diabetes patient. Thus, IPE and collaborative practice have been deemed as essential education for everyone involved with healthcare, ranging from students to healthcare professionals.

Based on these global needs, our unique IPE programme for healthcare professional students from Scotland and Japan was conducted as a pilot. First, the participants of this programme were a mixed batch of healthcare professional students from Scotland and Japan. Second, the participants discussed the same diabetic scenario with a SP within their local team in Scotland and Japan. Finally, through the live IPE Webinar on 14 November 2014, on the World Diabetes Day, the participants discussed and exchanged care pathways for the standardised patient (SP), despite the geographical distance and cultural differences.

The aim of this pilot programme was for Scottish and Japanese students to share and learn from each other about universal patient-centred diabetes care through the first novel international IPE (IIPE) on live webinar.

## METHOD

### *Programme development by Scottish and Japanese collaborative team*

#### a. Setting up an the online shared platform

The Robert Gordon University and Aberdeen University used an inter-university virtual learning environment (VLE) CampusMoodle. Nagoya University was invited to collaborate on an online module on the VLE. This online module provided knowledge for students on diabetes in both the languages. We provided both Scottish and Japanese Diabetes guidelines, 'Management of diabetes, a national clinical guideline: Scottish Intercollegiate Guidelines Network (SIGN) 2010'<sup>7)</sup> and 'Evidence-based Practice Guideline for the Treatment for Diabetes in Japan 2013',<sup>3)</sup> as a part of the online module.

#### b. Developing the scenario

A case based diabetic scenario was pioneered in Nagoya University and then translated into English. In Scotland, the collaborative team adjusted the scenario for the Scottish environment and patient details. The case based scenario reflected diabetes care in each country and was

**Table 1** The summary of diabetic scenario in Scotland and Japan

<b>Case: Mrs. Fraser 65-year-old female</b> (Scottish scenario)	<b>Case: Mrs. Hayashi 65-year-old female</b> (Japanese scenario)
<b>Setting:</b> Attended the Diabetic Clinic at the Aberdeen Royal Infirmary for further Diabetes Mellitus education from the Diabetes Specialist Nurse regarding commencement of insulin injections.	<b>Setting:</b> Admitted the Tsurumai University Hospital for Diabetes Mellitus education including introduction to insulin therapy.
<ul style="list-style-type: none"> <li>• When Mrs. Fraser was 55 years old, she was diagnosed with type 2 Diabetes Mellitus.</li> <li>• At her last clinic appointment, she was found to have decreased insulin secretions, simple retinopathy, nephropathy stage 2 and neuropathy in limbs with her General Practitioner.</li> <li>• Due to the increased complications the multidisciplinary team discussed the introduction of insulin therapy in the form of injections.</li> <li>• At the clinic her blood sugar level was 12.2 mmol/l and her HbA1c was 8.8%.</li> </ul>	<ul style="list-style-type: none"> <li>• When Mrs. Hayashi was 55 years old, she was diagnosed with type 2 Diabetes Mellitus.</li> <li>• She was consulted for strict blood sugar control and introduction to insulin therapy. The consultant did outpatient tests and found decreased insulin secretion and complications progress (simple retinopathy, nephropathy, neuropathy numbness in limbs).</li> <li>• She was diagnosed with insufficient control with oral medications and was introduced to insulin injection.</li> <li>• Admission blood sugar level: 220mg/dl, HbA1c 8.8%.</li> </ul>

The characters and events depicted in these scenarios were fictitious.

developed using a SP. SPs from both the countries were trained by the same SP trainer using the same methodology. Table 1 gives the summary of the diabetic scenario used.

#### c. Running the live webinar

We selected the online tool, Blackboard Collaborate™ for the live webinar. The time schedule for webinar on 14 November 2014, the World Diabetes Day, was decided carefully considering the time-zone differences. Both the locations utilised a screen and webcam connected with the Blackboard Collaborate™.

#### *Details of the international interprofessional education (IPE) programme*

All participants experienced three steps. In Step 1, the same VLE, CampusMoodle was used in both the countries. Step 2 involved learning from diabetic case-based scenario and interview of the relevant SP in each country. Finally, Step 3 involved sharing of the conclusions from each country by webinar IPE.

Student participants included three medical students and four pharmacy students from Japan and one medical student, two pharmacy students, two nutrition students and one occupational therapy (OT) student from Scotland. Japanese medical students included two fifth- and one sixth-year graders and all Japanese pharmacy students were in their fifth grade, while all Scottish students were in their final year of study. All participants could access the Robert Gordon University Virtual Learning Environment (VLE) CampusMoodle. The students were provided the same material on their systems. The materials concerned IPE and collaborative practice, diabetes care guidelines in Scotland<sup>7)</sup> and Japan,<sup>3)</sup> a case-based scenario with SP who was diagnosed with insufficient control with oral medications and was asked to initiate insulin injection. After self-directed learning on CampusMoodle, the students discussed the scenario and interviewed the

**Table 2** Interdisciplinary Education Perception Scale (IEPS)

Questions	Score					
	1	2	3	4	5	6
1. Individuals in my profession are well-trained	1	2	3	4	5	6
2. Individuals in my profession are able to work closely with individuals in other professions	1	2	3	4	5	6
3. Individuals in my profession demonstrate a great deal of autonomy	1	2	3	4	5	6
4. Individuals in other professions respect the work done by my profession	1	2	3	4	5	6
5. Individuals in my profession are very positive about their goals and objectives	1	2	3	4	5	6
6. Individuals in my profession need to cooperate with other professions	1	2	3	4	5	6
7. Individuals in my profession are very positive about their contributions and accomplishments	1	2	3	4	5	6
8. Individuals in my profession must depend upon the work of people in other professions	1	2	3	4	5	6
9. Individuals in other professions think highly of my profession	1	2	3	4	5	6
10. Individuals in my profession trust each other's professional judgment	1	2	3	4	5	6
11. Individuals in my profession have a higher status than individuals in other professions	1	2	3	4	5	6
12. Individuals in my profession make every effort to understand the capabilities and contributions of other professions	1	2	3	4	5	6
13. Individuals in my profession are extremely competent	1	2	3	4	5	6
14. Individuals in my profession are willing to share information and resources with other professionals	1	2	3	4	5	6
15. Individuals in my profession have good relations with people in other professions	1	2	3	4	5	6
16. Individuals in my profession think highly of other related professions	1	2	3	4	5	6
17. Individuals in my profession work well with each other	1	2	3	4	5	6
18. Individuals in other professions often seek the advice of people in my profession	1	2	3	4	5	6

SP in national groups. Then, they prepared for the webinar to be held on the World Diabetes Day. The live webinar IPE using the Blackboard Collaborate™ on that day was started at 09:00 hours in Scotland and at 18:00 hours in Japan. Students gathered together at the same conference room in each country and split their presentation into seven short categories: i. sharing case study and summarising care and treatment, ii. assessment process by each discipline, iii. care

and treatment by each profession, iv. key collaborative areas of team working, v. identifying the benefits when team works well, vi. complications that arises when the teams does not work well together, and vii. documentation. The live webinar IPE closed at 11:00 hours in Scotland and 20:00 hours in Japan.

To mark the World Diabetes Day and the student webinar, some number of notable buildings in Japan and Scotland were lit in blue colour, as used by WHO representing diabetes. The buildings included those of Nagoya Castle, Marischal College, and Robert Gordon University.

#### *Descriptive statistics of international interprofessional education (IPE)*

The IPE programme is expanding rapidly across the world. The publication of competencies from the IPE collaborative (IPEC) was a significant step forward to recognise the importance of health professional collaboration as well as to guide institutions to develop educational programmes.<sup>8)</sup> However, there remains a substantial difficulty in implementation as well as considerable variability in the assessment of learners' interprofessional collaborative knowledge and skills and in the evaluation of IPE programmes.<sup>8)</sup>

We employed the interdisciplinary perception scale (IEPS)<sup>9-11)</sup> with permission in both English and Japanese languages before and after this programme and then described the effect of the IPE focusing to understand the contributions of self-professionals and other professionals in each of the participating countries (Table 2). This questionnaire includes 18 questions and is scored to the 6-point Likert scale. The students indicated the degree to which they agreed or disagreed with the statement by drawing a circle around the number of the response that best expressed their feelings, based on the following scale: 6 = strongly agree, 5 = agree, 4 = somewhat agree, 3 = somewhat disagree, 2 = disagree and 1 = strongly disagree. The maximum score was 108 and the minimum was 18.

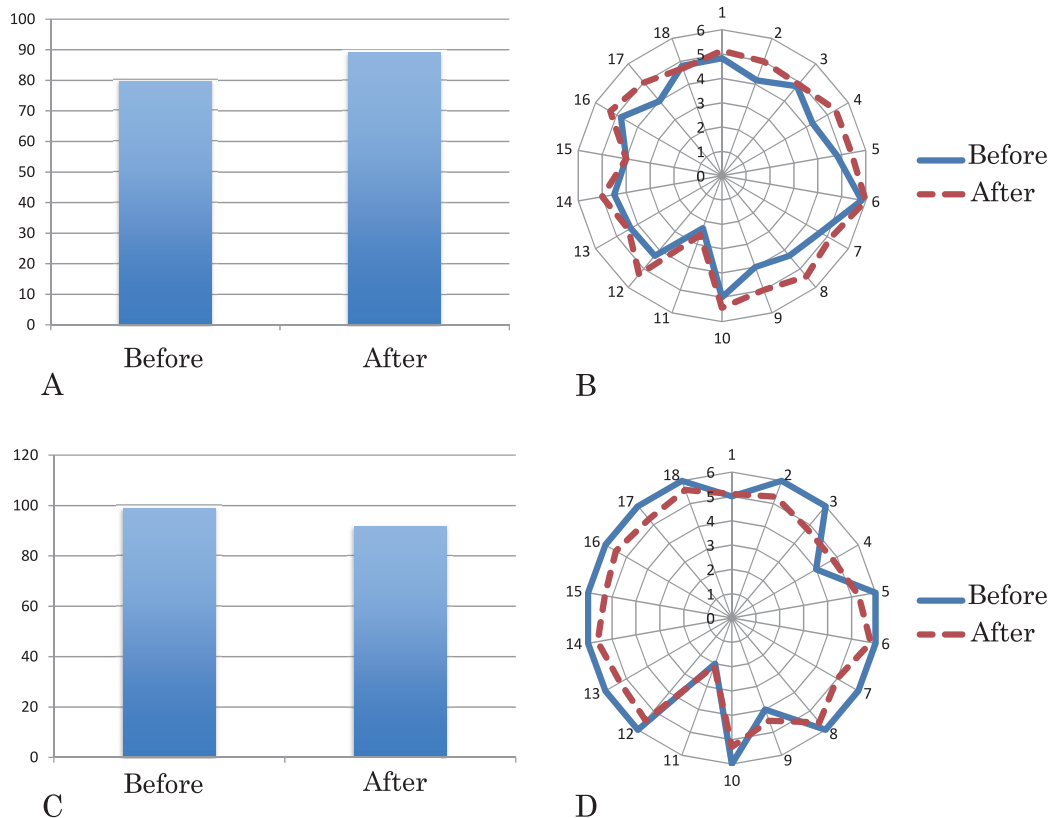
#### *Ethical Considerations*

No ethical issues were identified in this research and the research protocol was approved by the ethical committee of the Nagoya University School of Medicine, School of Pharmacy and Life Sciences Research Ethics Committee in Robert Gordon University, Aberdeen.

## RESULTS

Both the student groups identified and compared the patient's thoughts and feelings about their care protocol. As the Japanese team included students belonging to only two professions (medicine and pharmacy), they considered the patient's medication adherence and side-effects in depth. For example, they demonstrated injection use with an insulin device, attempted to improve patients' negative image of insulin injection and informed patients about the importance of protecting pancreatic secretions to avoid the progression of diabetic complications. However, as the Scottish team additionally included students from nutrition and OT backgrounds, their assessment involved additional perspectives. Nutritional support with psychosocial support was mentioned and a discussion was held on the benefits of walking and pain management against the difficulties of long distance walking because of knee pain.

Based on their presentations on the live webinar, four main differences in the patient approach were apparent between the two countries. These differences were divided into four types, which were i) anxiety of starting insulin therapy, ii) appropriate nutrition and snacks between meals, iii) the difficulties of long distance walking because of knee pain, and iv) prevention for complication of diabetes.



**Fig. 1** Comparison of the total score and each question score of IEPS between Japanese students (A and B) and Scottish students (C and D)  
 Fig. 1A shows the improvement in the average score of IEPS in Japanese students from 79.7 to 89.1 after IPE. Fig. 1B shows the change in individual question's score in Japanese students. Fig. 1C shows the slight decline in the average score of IEPS in Scottish students slightly declined from 99.0 to 91.7 after IPE. Fig. 1D shows the change in individual question's score in Scottish students.

Six of seven Japanese students and six Scottish students answered the IEPS before and after this programme. Although the Japanese students' average score of IEPS in total elevated from 79.7 to 89.1, the Scottish students' average score of IEPS in total declined from 99.0 to 91.7 after the programme (Fig. 1).

### DISCUSSION

Despite using almost the same scenario, Scottish and Japanese students reached different conclusions. Table 3 shows the characteristics of the presentation between the Scottish and Japanese teams. There were four points of difference identified for patients' case (Table 3). The Japanese team belonged to only two professions and they focused on the demonstration of insulin device to reduce the patients' anxiety of initiating insulin therapy. The Scottish team belonged to the professions of nutrition and OT, and their assessment involved additional perspectives, including the psychological approach for diet, pain management for exercise, changing the different oral

**Table 3** The characteristics of the presentation from live webinar between Scottish and Japanese teams on the World Diabetes Day 2014

<b>The differences of approach for the patients between two countries</b>	<b>Japanese team</b>	<b>Scottish team</b>
1) Anxiety of starting insulin therapy	<ul style="list-style-type: none"> <li>• Demonstration of injection using the device</li> <li>• Improvement of patients' negative image for insulin injection</li> <li>• Protection of pancreas secretion</li> </ul>	<ul style="list-style-type: none"> <li>• Change the other oral medicines</li> </ul>
2) Appropriate nutrition and snacks between meals	<ul style="list-style-type: none"> <li>• Explanation of snacks' calories</li> </ul>	<ul style="list-style-type: none"> <li>• Nutrition support with psychosocial support</li> </ul>
3) The difficulties of long-distance walking because of knees' pain	<ul style="list-style-type: none"> <li>• Many approaches of exercises with specific examples</li> </ul>	<ul style="list-style-type: none"> <li>• Suggestion for load reduces walking and pain management</li> </ul>
4) Prevention for complication of diabetes	<ul style="list-style-type: none"> <li>• Explanation of diabetic complications in detail</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccination for prevent infections, blood pressure and serum lipid control, monitoring renal function</li> </ul>

antidiabetic agents and monitoring not only glycaemic control but also blood pressure, lipid, and renal function. Thus, based on our results, we conclude that collaborative practice for patient care can benefit from the involvement of different healthcare professions.

Several reasons have been attributed for the differences in the suggestions for future care, including the diversity of students in the two national groups, the wealth of experience in IPE and collaborative care cases existing in Scotland, the introduction of the psychological approach for changing patients' lifestyle for better addressing quality of life, issues and the different infrastructure for the health service between the two countries (Fig. 1).

According to the Diabetes Attitudes, Wishes and Needs second (DAWN 2) study,<sup>12)</sup> a substantial variation in the perceptions of healthcare professionals in different countries were noted. Despite these differences, healthcare professionals across all countries agreed that the current healthcare provision system for diabetic people is inadequate.<sup>13)</sup> In Japan, as compared to that in United Kingdom (UK), the proportion of people with diabetes who were evaluated for psychological assessment by medical professions is few.<sup>14)</sup> In addition, the proportion of healthcare professionals who reported not having resources to offer patients who were emotionally distressed or at risk of depression was higher in Japan than that in UK.<sup>13)</sup>

The use of IEPS as the method of evaluation of IPE programme has been considered controversial.<sup>15)</sup> The measurement of the extend of understanding by the participant about the role of their and the other professionals is preferred. Although Japanese participants showed improvement in their IEPS score, the Scottish participants showed a reverse performance. One of the reasons for this difference could be because of the background of the IPE experiences of the Scottish participants. Japanese students had fewer IPE experiences, as compared to their Scottish counterparts. Thus, prior to this IPE programme, their potential score of IEPS was already high. Furthermore, the Japanese students found the IPE programme difficult because of the linguistic difference, which forced them to learn the role of their and other professions

deeper both in Japanese and in English language in a positive sense.

The limitation of this project was the small number of students' participants from both the countries owing to the pilot nature of the study as well as in it being the first overseas webinar IPE. Unfortunately, no Japanese nursing, nutrition or OT students participated in this programme. One reason for this could be that most Japanese university students, except medical students and pharmacy students, harboured negative feelings regarding working on a complicated patient scenario in another language (i.e. English). However, according to the World Federation for Medical Education, the global standards in medical education are required worldwide for better healthcare. To accomplish this globalised approach, we recommend that both Japanese and UK medical and paramedical students should participate in overseas collaborative programmes, such as the present IPE.

Overall, all participants identified that their learning was improved not only about the diversity of the healthcare systems but also about the cultural issues apparent in developing patient-care regime. In the future, a live webinar could be one of the most effective solutions for global standardisation of medical service and patient-centred care.

In conclusion, this IPE was the first experience of IPE programme. All participants learned that interprofessional collaboration was clearly required for diabetes management focused on patient-centred care and that more diverse the team be in terms of professions more comprehensive care solutions can be devised for the patients. This programme was significant in raising awareness about the need for international interprofessional intervention for diabetes. To highlight the World Diabetes Day and the student webinar, several notable buildings in Japan and Scotland were lit in blue colour, which was used by the WHO for signifying diabetes. The buildings included Nagoya Castle, Marischal College and Robert Gordon University. The success of this venture was also recognised by a motion at the Scottish parliament. In the near future, various IPE events could be held worldwide.

## ACKNOWLEDGEMENTS

This study was supported by funding from 'The Great Britain SASAKAWA foundation'. We acknowledge the contribution of e-learning supporting team from Robert Gordon University in Scotland and the pharmacy staff from Meijo University for recruitment of pharmacy students in Japan.

## CONFLICTS OF INTERST

Mina Suematsu, Noriyuki Takahashi and Kentaro Okazaki are the members of Graduate School of Medicine Endowed Chairs in Nagoya University, which is endowed by Aichi prefecture government and Nagoya city government; however, they are not directly associated with this study. The other authors declare no conflicts of interest associated with this manuscript.

## REFERENCES

- 1) IDF DIABETES ATLAS 7th EDITION Available at: <http://www.diabetesatlas.org>
- 2) Inzucchi SE, Bergenstal RM, Buse JB, Diamant M, Ferrannini E, Nauck M, *et al.* Management of Hyperglycemia in Type 2 Diabetes: A Patient-Centered Approach. *Diabetes Care*, 2012; 35: 1364–1379.
- 3) Evidence-based Practice Guideline for the Treatment for Diabetes in Japan 2013 Available at: <http://www>.



- jds.or.jp/modules/en/index.php?content\_id=44
- 4) The Diabetes Control and Complications Trial (DCCT) Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes. *N Engl J Med*, 1993; 329: 977–986.
  - 5) Shojania KG, Ranji SR, McDonald KM, Grimshaw JM, Sundaram V, Rushakoff RJ, *et al*. Effects of quality improvement strategies for type 2 diabetes on glycemic control: a meta-regression analysis. *JAMA*, 2006; 296: 427–440.
  - 6) Framework for Action on Inter-professional Education & Collaborative Practice. WHO 2010, 18–22.
  - 7) Management of diabetes a national clinical guideline: Scottish Intercollegiate Guidelines Network (SIGN) 2010, 9–29.
  - 8) Blue AV, Chesluk BJ, Conforti LN, Holmboe ES. Assessment and evaluation in interprofessional education: exploring the field. *J Allied Health*. 2015; 44: 73–82.
  - 9) McFadyen AK, Maclaren WM, Webster VS. The Interdisciplinary Education Perception Scale (IEPS): An alternative remodelled sub-scale structure and its reliability. *J Interprof Care*, 2007; 21: 433–443.
  - 10) Luecht RM, Madsen MK, Taugher MP, Petterson BJ. Assessing professional perceptions: design and validation of an Interdisciplinary Education Perception Scale. *J Allied Health*. 1990; 19: 181–191.
  - 11) Itakura M, Sugimoto N. Development of Interdisciplinary Education Perception Scale (IEPS) in Japanese. *The Journal of Interprofessional Collaboration in Health and Social Care*, 2013; 5: 93.
  - 12) Holt RI, Kalra S. A new DAWN: Improving the psychosocial management of diabetes. *Indian J Endocrinol Metab*, 2013; 17: 95–99.
  - 13) Holt RI, Nicolucci A, Kovacs Burns K, Escalante M, Forbes A, Hermanns N, *et al*. Diabetes Attitudes, Wishes and Needs second study (DAWN2™): Cross-national comparisons on barriers and resources for optimal care—healthcare professional perspective. *Diabetic Medicine*, 2013; 30: 789–798.
  - 14) Nicolucci A, Kovacs Burns K, Holt RI, Comaschi M, Hermanns N, Ishii H, *et al*. Diabetes Attitudes, Wishes and Needs second study (DAWN2™): Cross-national benchmarking of diabetes-related psychosocial outcomes for people with diabetes. *Diabetic Medicine*, 2013; 30: 767–777.
  - 15) Oates M, Davidson M. A critical appraisal of instruments to measure outcomes of interprofessional education. *Med Educ*, 2015; 49: 386–398.