Feasibility of an interprofessional collaborative osteoporosis screening programme in Malaysia

Abstract

Background: Population screening for osteoporosis using bone mineral density scan is not feasible in Malaysia as this test is costly. Hence, there is a need to develop a more efficient method to screen for osteoporosis.

Objectives: To determine the feasibility of an interprofessional collaborative osteoporosis screening programme (IPC-OSP)

Methods: Postmenopausal women aged ≥50 years, who had not been diagnosed with osteoporosis were recruited from a primary care clinic from June-August 2014. Patients were assessed for their osteoporosis risk and were counselled on prevention methods. Patients at risk were referred to the doctor with a recommendation for a bone mineral density (BMD) scan.

Results: Fifty out of 55 patients were recruited [response rate=90.9%]. A total 26/50(52.0%) went for a BMD scan, none were osteoporotic, 17/50(34%) were osteopenic, 2/50(4.0%), were started on osteoporosis medications and 14/50(28%) modified their lifestyle to improve bone health or started on calcium supplements. Osteoporosis knowledge significantly increased from baseline to month two (46.3±21.4 vs 79.1±14.3,$p<0.001$). Patients had a satisfaction score of 89.8±12.4. Follow-up rates were 83.9% and 100% at months 1 (BMD appointment) and 2 (phone follow up), respectively. The intervention was successfully coordinated. Data entry was determined to be viable based on the researchers' experience.

Conclusion: The IPC-OSP was found to be feasible in Malaysia.

Impact on practice:

- An interprofessional collaborative osteoporosis screening programme (IPC-OSP) was developed in Malaysia as it was not cost effective to perform population screening for osteoporosis using the bone mineral density scan
- Interprofessional collaboration in osteoporosis screening is important as collaborative initiatives have demonstrated better patient outcomes, reduced cost and improved working relationships among health disciplines.
- An interprofessional collaborative osteoporosis screening program by doctors and pharmacists was feasible when implemented in one primary care clinic in Malaysia.
- However, the role of nurses was unclear as nurses may require additional training on how to identify women who may be at risk for osteoporosis.

Introduction

Approximately 20% of women who had an osteoporosis-related fracture received either a bone mineral density (BMD) scan; or were prescribed medications to treat osteoporosis within the period of six months after the fracture has occurred [1]. An interprofessional collaborative osteoporosis screening programme (IPC-OSP) was developed in Malaysia as it was not cost effective to perform population screening for osteoporosis using the bone mineral density scan. However, before an intervention can be implemented in clinical practice, the feasibility of the intervention should be determined.

Aim of the study

To determine the feasibility of an interprofessional collaborative osteoporosis screening programme (IPC-OSP) in a primary care clinic in Malaysia.

Ethics approval

Ethical approval from the University Malaya Medical Centre Ethics Committee was obtained prior to the study (ref no. 920.26).

Methods

Setting and participants

Community-dwelling postmenopausal women aged ≥ 50 years old who had not been diagnosed with osteopenia/osteoporosis were recruited at a primary care clinic in Kuala Lumpur from June to August 2014. Participants with a history of metabolic disease, presence of bone metastasis, significant renal impairment, previous bilateral oophorectomy, history of hip fracture or prior use of bisphosphonates were excluded.

Primary and secondary outcomes

The typology developed by Tickle-Dengen (2013) was used to categorize the primary and secondary outcomes. Four aspects were assessed: scientific, process, resources and management outcomes[2, 3].

Primary outcomes

Scientific assessment

Our primary outcome was to measure the proportion of patients who went for a BMD scan.

Secondary outcomes

Scientific assessments

Five secondary scientific outcomes were measured: the proportion of patients 1) diagnosed with osteoporosis/osteopenia, 2) started on osteoporosis medications, 3) who modified their lifestyle to improve bone health (by taking calcium supplements, increasing their dietary calcium or performing weight-bearing exercises), patients' 4) who had an increase in osteoporosis knowledge and 5) who were satisfied with the IPC-OSP.

Patients' osteoporosis knowledge was measured pre- and post-intervention. Patients' satisfaction towards the IPC-OSP was measured at the end of the feasibility study.

Process assessment

The intervention's processes: such as response rates, follow-up rates, suitability of the inclusion/exclusion criteria, suitability of data collection methods, amount of patients' time to complete the intervention and capacity to complete data collection procedures were assessed.

Resource assessment

The resources assessed were the coordination of intervention between nurses, pharmacists, patients and doctors, and time to conduct the intervention at each stage. Other resources assessed were the physical conditions (space and comfort), whether there was sufficient equipment available and documentation of research forms.

Management assessment

This was assessed by determining the accuracy of data entry and adherence to the ethics of research. The researcher's experience (as a clinical pharmacist who was familiar with the

capacity and workflow of the clinic) was used to assess the process, resource and management assessments.

Instruments used

Osteoporosis Self-Assessment Tool for Asians (OSTA)

The validated OSTA was used to screen a patient's risk for osteoporosis [4]. Patients were classified as low, moderate or high risk, based on their weight (in kilograms) deducted from age (in years) and multiplied by -0.2 [4].

Fracture Risk Assessment tool (FRAX)

The Singapore FRAX model [5]was used to provide additional information regarding patient's fracture risk to aid the doctor in deciding if a BMD scan was needed as the Malaysian FRAX model was not developed when our study was conducted [5].

Osteoporosis Prevention and Awareness tool (OPAAT)

The validated OPAAT [6] was used to assess patients' osteoporosis knowledge. It consists of 30 items categorized into three domains: osteoporosis in general, consequences of untreated osteoporosis and osteoporosis prevention. Response options were true, false, don't know. A score of one was given for a correct response and zero for an incorrect or do not know response. A higher score indicates better knowledge.

Satisfaction Questionnaire for Osteoporosis Prevention (SQOP).

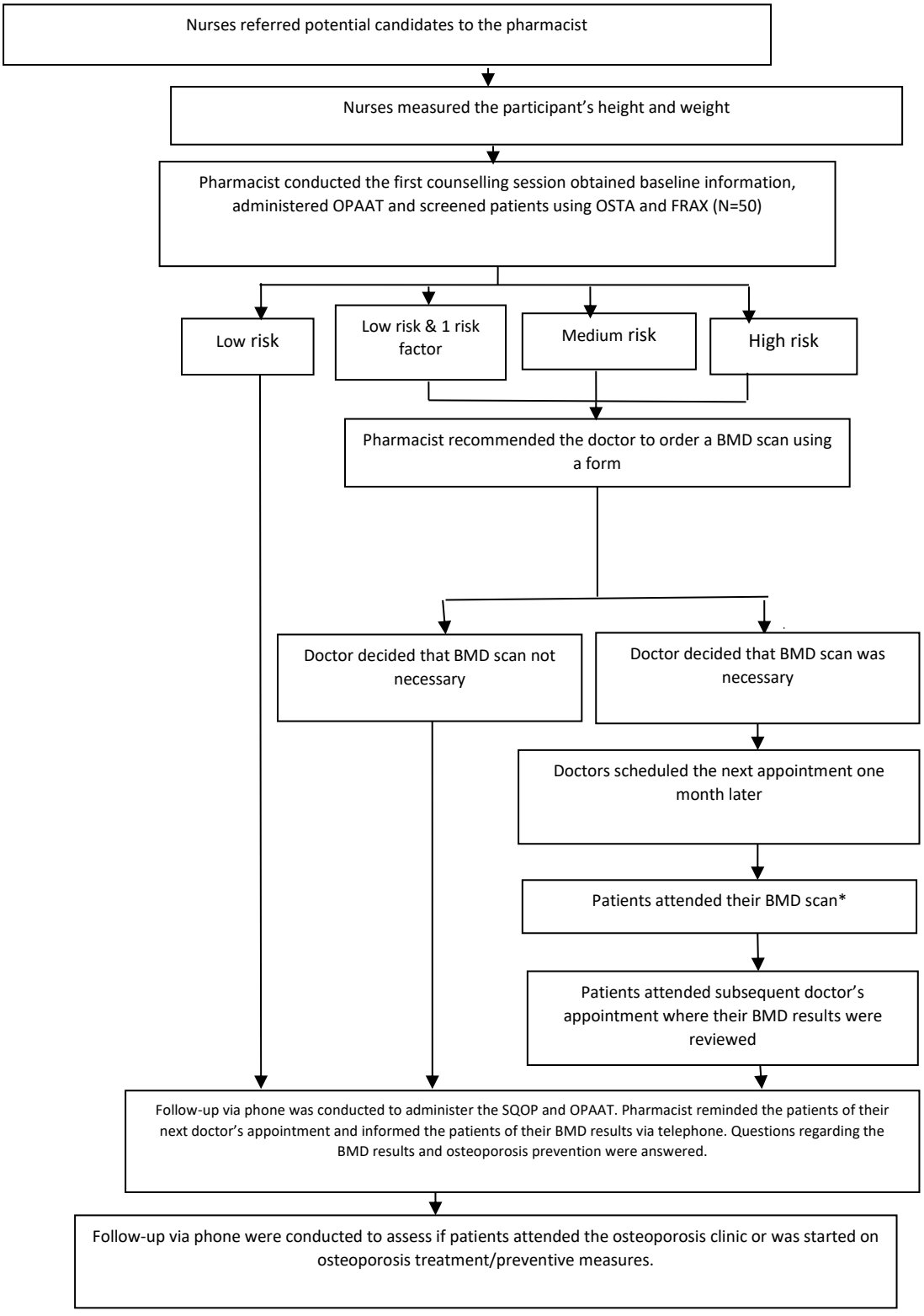
The validated SQOP [7] was used to assess patients' satisfaction towards the IPC-OSP. It consists of 23 questions with a five-point Likert-type response.. Responses were categorized into six domains: outcomes/efficacy, accessibility/convenience, technical quality, interpersonal relationship, finance and continuity. A higher score indicates higher satisfaction.

The Interprofessional collaborative osteoporosis screening programme (IPC-OSP)

This IPC-OSP was developed from a previous qualitative study which explored the barriers and facilitators regarding an osteoporosis screening programme[8]. The behavioural change wheel

was used to analyse this data to ensure that the intervention was acceptable and sustainable[9]. Patients' osteoporosis risk was assessed using the OSTA. The FRAX was used to provide additional information regarding the patient's fracture risk. Patients were referred for a BMD scan (if required) and received counselling regarding osteoporosis (Figure 1).

Figure 1: Flow chart on the interprofessional collaborative osteoporosis screening programme (IPC-OSP)



*The patients and the researcher received a copy of the results. Abbreviations:

- BMD: Bone Mineral Density
- OSTA: Osteoporosis Self-Assessment Tool for Asians
- OPAAT: Osteoporosis Prevention and Awareness Tool
- SQOP: Satisfaction Questionnaire for Osteoporosis Prevention
- FRAX- WHO Fracture Risk Assessment tool

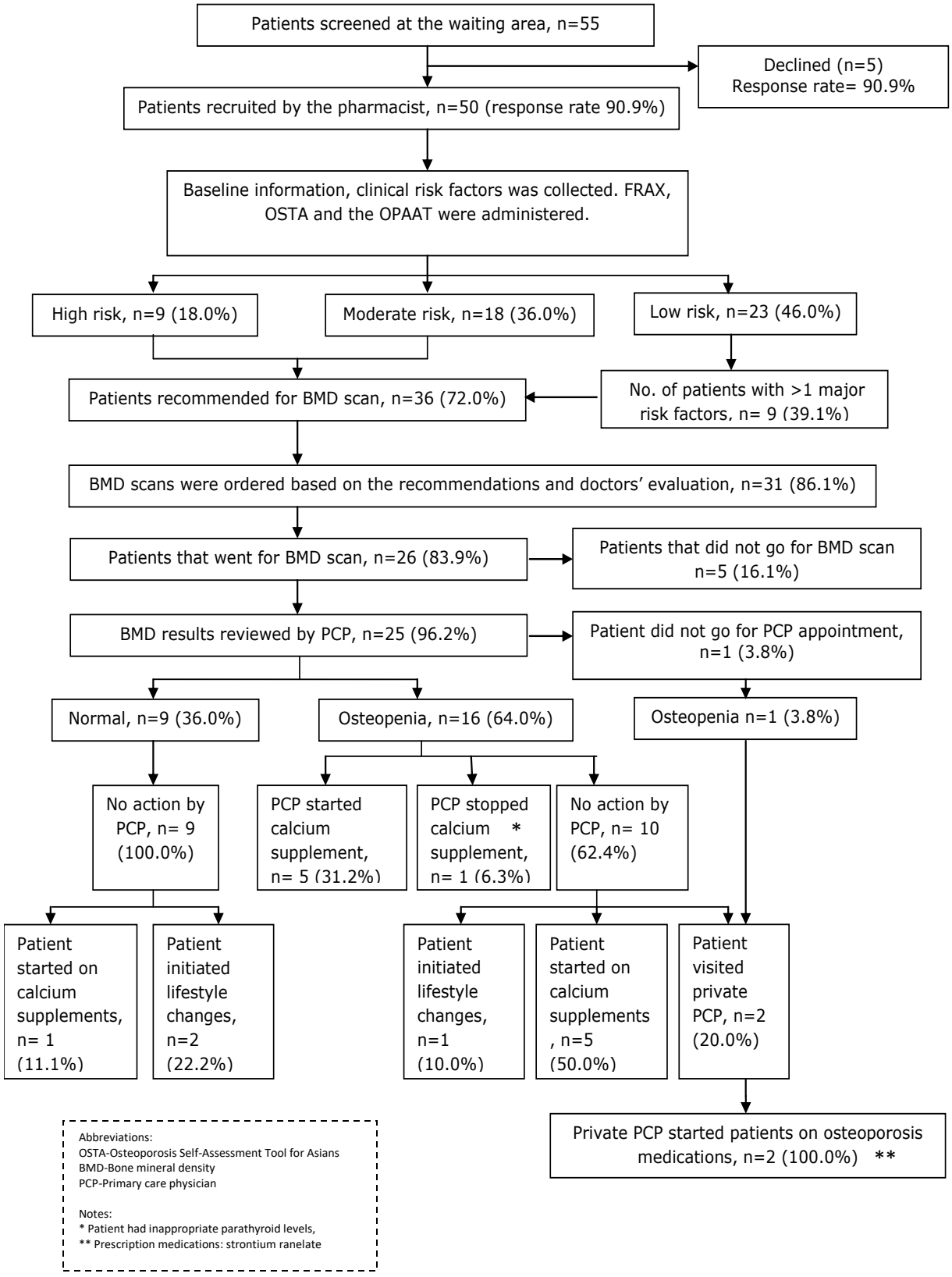
Data Analysis

All data was entered into the IBM® SPSS® version 20 (IBM Corporation, Armonk, NY, US). Non-parametric tests were used since data obtained were not normally distributed. Categorical variables were presented as proportion. Continuous variables were presented as median and interquartile range. McNemar's test was used to examine the pre and post scores of the individual items in the OPAAT. A p-value <0.05 was considered as statistically significant.

Results

A total of 50/55 patients agreed to participate (response rate= 90.9%). A total of 36/50(72%) patients were referred for a BMD scan, of which only 28/36(77.8%) recommendations were accepted by the doctor. additionally, 3 scans were ordered without the pharmacist's recommendation, as these scans were provided "free of charge". A total to 31/36 (86.1%) BMD scans were ordered. Reasons provided by the doctors on why BMD scans were not ordered were: 3/36(8.3%) patients' x-ray results were normal; 1/36(2.8%) doctor said that there were more urgent diseases to treat such as heart, endocrine or eye conditions; 1/36(2.8%) patient's blood calcium levels were normal; 1/36(2.8%) patient was "too young"; 1/36(2.8%) patient's FRAX fracture risk was considered too low (11% major osteoporosis fracture and 2.2% for hip fracture), and 1/36(2.8%) would be exposed to too much radiation as she had another appointment for a computed tomography (CT) scan. Ultimately, 26/31(83.9%) went for a BMD scan [Figure 2].

Figure 2: Results of the feasibility study



Seventeen out of the 26 patients who went for the BMD scan (65.4%) had osteopenia whilst none had osteoporosis; of which 2/26(7.7%) patients were started on strontium. Among those patients who had a normal BMD scan or osteopenia (n=26), 11 (42.3%) were started on calcium supplements and 3/26 (11.5%) modified their lifestyle to improve bone health (Figure 2).

Only 46/50 patients answered the OPAAT at baseline and one month later (response rate=92.0%). All three domains showed an increase in osteoporosis knowledge: osteoporosis in general (44.7±28.0 to 73.5±26.0), consequences of untreated osteoporosis (50.8±26.9 to 93.9±11.8) and prevention of osteoporosis (46.0±25.1 to 79.7±16.2). Overall, knowledge increased from 46.3±21.4 to 79.1±14.3, $p < 0.001$. Knowledge increased in 27/30(90.0%) items. One month later, patients' satisfaction score was 89.8±12.4.

Based on the response rate of 90.9% we found the inclusion criteria to be suitable. The follow-up rate was 26/31(83.9%) during the first follow-up and 26/26(100%) for the second follow-up.

Resource assessment

The pharmacist initially found it difficult to communicate her recommendations and procedures to the doctor. In order to resolve this, the pharmacist conducted individual briefing sessions with the doctors.

The pharmacist found that the risk assessment, counselling and administration of the OPAAT approximately 30 minutes for each patient. The time allocated was sufficient as patients usually had to wait at least 30 minutes before being called to see the doctor. For the first follow-up session, the administration of the OPAAT, SQOP and information on the BMD results took approximately 15-30 minutes depending on the number of questions the patients had. The second follow-up needed about five minutes.

Documentation was successful. The forms used by the pharmacists to make recommendations were documented into the patients' medical record. Equipment to measure BMD, height and weight were available throughout the intervention.

Management assessment

The pharmacist was able to document all data and outcomes needed into SPSS daily. There were also no problems with managing the procedures based on the ethics application.

Discussion

The current workflow was feasible, as both primary and secondary outcomes could be assessed. Our results concurred with previous osteoporosis screening programmes which showed an increase in BMD scans ordered, and initiation of calcium supplements and/or treatment [10].

Initially, the pharmacist had difficulty conveying recommendations to the doctor, and the nurses had difficulty screening for osteoporosis patients. Hence, modifications were made. The pharmacist screened for potential patients herself and this improved the feasibility of the IPC-OSP.

The satisfaction score of the patients were 89.8±12.4. This score was similar to the score achieved by the intervention group of the SQOP validation study which was 87.9±6.0. Based on this previous study the cut-off score was defined as 61.0 as the control group in this study achieved a satisfaction score of 61.9±8.-8[7].

Following the process assessments of the IPC-OSP, modifications were made to the data collection method. Initially, nurses were asked to refer potential patients to the pharmacists. This method was inefficient as nurses did not know how to screen patients as they were not trained to screen patients for osteoporosis. The pharmacist then screened for potential patients herself. Our findings were similar to a study in the United States, which found that the osteoporosis screening program performed better when it was conducted by a clinical-pharmacist , as opposed to a registered-nursed[11]. A training session pertaining to the IPC-OSP should be conducted for nurses to address this concern.

A limitation of this study was that the sample size used was small and results were not generalisable. However, the aim of this study was not to assess the effectiveness of the intervention. Therefore, we achieved the aim of our study, which was to assess the feasibility of the developed interprofessional collaborative osteoporosis screening programme. A further limitation of this study was the exclusion of men. It is possible that different psychological factors are related to the screening of osteoporosis in men, which need to be explored further.

The strength of this study was that the IPC-OSP was designed specifically for this setting following a qualitative study [8]. It was then supported by the use of the behavioural change wheel to ensure that the underlying psychological reason to conducting an osteoporosis screening programme was addressed [9]. Additionally, the instruments used (i.e. the OPAAT and the SQOP) were specifically developed and validated for this intervention [6, 7]. Furthermore, the IPC-OSP was coordinated by a pharmacist. The inclusion of pharmacists into healthcare delivery teams in literature have noted improved health outcomes in osteoporosis [12].

Conclusion

The IPC-OSP was found to be feasible when assessed in a primary care setting in Malaysia. However, a feasibility study does not assess the effectiveness of the IPC-OSP. A randomized controlled trial would be needed to determine if the IPC-OSP would improve patient outcomes such as reducing the number of osteoporotic-related fractures.

Conflicts of interest: Li Shean Toh, Pauline Siew Mei Lai, Bee Yean Low, Kok Thong Wong, and Claire Anderson declare that they have no conflict of interest.

Funding: Ministry of Science, Technology and Innovation (MOSTI) fund (06-02-12-SF0183).

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