INTRODUCTION

1.1 Background

The global status of oral diseases reported 2.4 billion people of dental caries of permanent teeth, 0.48 billion people of dental caries of deciduous teeth, 0.75 billion people of periodontal disease and 0.36 billion people of severe tooth loss. Even though oral diseases are not life-threatening diseases but these are chronic and cause a low quality of life (eg, lack of tooth for eating, speaking) and high treatment cost. The policymakers in countries around the world, including WHO, try to establish healthy populations and communities to promote well-being and quality of life. Health literacy is a composition of health education and communication activities, a fundamental tool to
promote health outcomes and to prevent diseases. One of the key indicators of overall health, well-being and quality of life is oral health. WHO provided the definition of oral health as "a state of being free from chronic mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual’s capacity in biting, chewing, smiling, speaking, and psychosocial well-being." Oral diseases are non-communicable diseases which can be prevented to maintain and promote healthy oral status. There is an interrelationship between health and oral health status; for example, diabetes is a risk factor for periodontitis. There is a relationship between health literacy, health behaviours and health outcomes, as well as health literacy, oral health behaviours and health outcomes. The aspect of oral health literacy was developed to promote good oral health.

Oral health literacy (OHL) can be defined as "the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate oral health decisions." Similar to health literacy, OHL needs skills involved in the aspects of the ability of individuals to (a) access basic health information through reading and asking, (b) listen to and understand written and spoken health information, (c) use and make appropriate decisions about health information and services to promote and maintain good health. The high OHL patients had a higher number of natural teeth left and less evidence of tooth decay than the low OHL patients. A low level of health literacy can be defined as a poor ability to understand, interpret health information, access care and follow medical suggestions that result in decreasing health status. Furthermore, poor OHL was found to be associated with missed dental appointments that might worsen oral health outcomes. A previous systematic review showed that the relationship of OHL might not be associated with oral health outcomes. However, the measurement tools for OHL in this study only used a word recognition instrument (patients can remember but not imply the meanings of words) so it could not be generalised to other aspects of OHL, such as understanding and making appropriate health decisions. Besides the OHL of the patients, there was a concern in terms of educating healthcare providers. It would be advantageous if healthcare providers (ie, physicians, dentists, dental assistants, dental hygienists and nurses) and health educators (medical, dental and nurse educators) could merge OHL and PCC concepts to promote a good oral health status that reflects healthy outcomes. Healthcare providers could enhance the OHL of patients by using PCC to educate their patients in promoting and maintaining their healthy status. Simultaneously, health educators are critical and key people to transfer OHL and PCC concepts to undergraduate and postgraduate students who used both concepts to take care of their patients to decrease the prevalence of oral diseases in the future. Up until the present, there have been many learning programmes and teaching techniques which were reviewed to promote OHL or PCC. No review of the research literature on both OHL and PCC has been conducted amongst health professionals.

1.2 | Objective

The objective of this systematic review was to determine the effectiveness of learning programmes and teaching techniques for healthcare providers to enhance OHL in their patients or enhance their PCC in routine healthcare services to promote good health care.

2 | METHODS

This systematic review was followed a guideline from PRISMA.

2.1 | Eligibility criteria

2.1.1 | Study design

The randomised controlled trials (RCTs), cluster RCTs or quasi-experiments were also included in this study.
2.1.2 | Population

The participants in this study included patients, caregivers, dental or medical students (both undergraduates and postgraduates) and healthcare providers (ie, physicians, physician assistants, dentists, dental assistants and nurses).

2.1.3 | Interventions

Interventions were eligible if the objectives were to improve OHL scores or PCC scores which contained at least one teaching technique to increase OHL or PCC and were delivered by healthcare providers in any study setting.

2.1.4 | Comparison

The factors of usual care, minimal intervention, no intervention and pre-intervention (in the case that there was no control group in the quasi-experiments) were considered control groups.

2.1.5 | Outcomes

The outcomes included learning programmes and teaching techniques that increased the OHL scores or PCC scores of both healthcare providers and patients.

2.1.6 | Language

The studies were published in English.

2.2 | Exclusion criteria

The outcomes of the studies were not learning and teaching techniques that increased OHL or PCC. The publication type was not experimental, such as editorial messages, letters to the editor, article reviews and systematic reviews. These studies were not published in English.

2.3 | Data sources and search criteria

The relevant studies were systematically searched for and identified using online databases: PubMed, ScienceDirect, ProQuest and Scopus. The searches covered the period from January 2008 to December 2017. The search strategy was conducted based on the PICO model and contained a combination of keywords: outcomes (ie, oral health literacy, oral health literacies, patient-centred communication, patient-centred communication, patient-doctor communication and doctor-patient communication). Due to the fact that there were very few relevant studies included in systematic searching, the keywords for the participants, the factors of intervention and comparison were not applicable. There were also additional resources (ie, Open Grey) used for searching. The search results were exported to the reference manager (EndNote 9), and the duplicates were identified and removed. The initial screening of titles and abstracts was performed using the Rayyan web-based app for exploring and filtering searches.²⁸

2.4 | Study selection

The titles and abstracts were independently screened by PN and KK in order to check their eligibility criteria. Any disagreements were discussed between the two reviewers or by consulting a third reviewer (UI) when needed.

2.5 | Methodological quality assessment

A methodological quality assessment of the studies was performed independently by PN and KK. The assessment tool was the Joanna Briggs Institute (JBI) Critical Appraisal tool of systematic reviews for effectiveness.²⁹ There were two JBI critical appraisal tools used in this assessment; tools for quasi-experiments with nine criteria and tool for RCTs (containing thirteen criteria), with answers including “Yes,” “No,” “Uncertain” and “Not applicable (NA).” A scoring system was designed by reviewers (PN, UI and KK). The cut-off score for inclusion criteria was 65% of the criteria of the JBI critical appraisal tools (score <5 and <8 in quasi-experiment and RCTs, respectively). The agreement measurement was calculated by the Intraclass Correlation Coefficient (ICC) with a value close to 1 as coding amongst reviewers was perfectly reliable and close to 0 when there was no agreement.³⁰ The ICC in this study was 0.938 (indicating excellent reliability).

2.6 | Data extraction

A data extraction template was designed to extract the following data from each study: (a) author and publication year; (b) type of study; (c) study setting; (d) participants; (e) learning programmes; (f) teaching techniques; (g) intervention period and follow-up; (h) outcomes and (i) effect sizes. The data from each study were independently extracted by two reviewers (PN and KK). Any disagreements were resolved by a discussion between the two reviewers.

3 | RESULTS

The search process and selection of the study were presented in a flow diagram in Figure 1. A total of 1,475 records were identified.
After the duplicates were removed, 1066 titles and abstracts were screened for eligibility. A total of 944 references were excluded, and 122 full-text references were included and checked in terms of the eligibility criteria. The nine studies \(^{31-39}\) were included in the methodological quality assessment.

### 3.1 Methodological quality assessment

A summary of methodological quality assessment was shown in Table 1. The included studies met 85%-100% and 78% of the criteria on the JBI Critical Appraisal Tool for RCTs and quasi-experiments, respectively.

### 3.2 Study characteristics

The general characteristics of the studies were shown in Table 2. The 6 RCTs \(^{31,34,36-39}\) and three quasi-experiments \(^{32,33,35}\) were included in this review, which was published from January 2008 to December 2017. There were six studies about PCC (containing 4 RCTs, \(^{34,36,37,39}\) one cluster RCT \(^{38}\) and one quasi-experiment \(^{35}\) ) whilst three studies on OHL (containing 1 RCT \(^{31}\) and two quasi-experiments \(^{31,33}\) ). The 2226 participants were also included in this review. The participants were classified into two main groups which included 245 healthcare providers and 1981 patients. All of these studies were set in health organisations, and approximately 56% of these studies were conducted in the United States of America.\(^{32-36}\)

### 3.3 Learning programmes and teaching techniques

The effectiveness of learning programmes and teaching techniques was summarised in Table 3. All of the studies, such as learning programmes (ie, workshops, training and community-based rotation) and teaching techniques (ie, lectures, discussion, simulated patient/patient instructors, role-play, feedback and reflection, coaching for patients, motivational interviewing, face-to-face instruction/demonstration, debriefing, didactic and clinical practice, hands-on activities, the WEMS technique, the NURSE model, assigning homework, using an interactive display, motivation interviews and self-observations) included in this review could increase the OHL and PCC, except for the studies by Fenton et al\(^{36}\) and Krob.\(^{32}\)

Fenton et al\(^{36}\) tried to promote patient-centred communication of medical residents using a combination of role-play with simulated patient/patient instructors and feedback from simulated patient instructors, whilst Krob\(^{32}\) tried to raise OHL levels and to improve the OHL of patients by using face-to-face instruction/demonstration, the teach-back, and the show-me method.

#### 3.3.1 Intervention period and follow-up

The effective intervention period showed that the improved OHL and PCC behaviours were accumulated throughout a period of 40 minutes\(^{36}\) to 19.5 hours\(^{37}\) (Table 3). Most of the studies used multiple sessions which took approximately 20 minutes\(^{36}\) to a half-day\(^{35,38,39}\) per session (Table 3). The effectiveness of the learning programme was indicated in the follow-up period to observe the retention of OHL.
The effect size was determined by calculating Cohen’s $d$ (d), $\eta^2$ (eta squared), or $r^2$ (r-squared). The effect size was interpreted as small, medium, or large differences, respectively. The OR was equal to 1.5, 3.5, and 9.0 are interpreted as small, medium, and large differences, respectively. The OR was equal to 0.2, 0.5, and 0.8 are interpreted as small, medium, and large differences, respectively. The OR was equal to 0.2, 0.5, and 0.8 are interpreted as small, medium, and large differences, respectively. The OR was equal to 0.2, 0.5, and 0.8 are interpreted as small, medium, and large differences, respectively.  

3.3.2 | Effect sizes  

The effect size was determined to be the difference or association between two or more groups. The six studies reported effect sizes in terms of Cohen's $d$ (d), $\eta^2$ (eta squared), or $r^2$ (r-squared). Amongst the included studies, three learning programmes were used for workshops (50%), training (40%), and rotation (10%; Table 3). The Helitzer study used both training and a workshop, but the workshop was optional.

3.3.3 | The frequency of the usage of learning programmes and teaching techniques

Amongst the included studies, three learning programmes were used for workshops (50%), training (40%), and rotation (10%; Table 3). The Helitzer study used both training and a workshop, but the workshop was optional.

The teaching techniques used in this review included 17 techniques: feedback and reflection (18%), role-play (16%), using simulated patients (13%), lectures (11%), discussions (8%), face-to-face instruction and demonstration (5%), coaching for patients (3%), debriefing (3%), didactic and clinical practice (3%), hands-on activities (3%), homework (3%), interactive displays (3%), and the WEMS technique (3%; Table 4).
This study aimed to investigate the effectiveness of learning programmes and teaching techniques for healthcare providers to enhance the PCC or OHL levels of their patients for good health care. There were six studies retrieved on learning programmes and teaching techniques to enhance PCC and three studies to enhance OHL. The most frequently used learning programmes included workshops and training. The three most frequently used teaching techniques were feedback and reflection, role-play, and the use of simulated patients.

Amongst the excluded references, there were four systematic review articles on PCC. They suggested some interesting points about the effectiveness of PCC. Newell studied the opinions of patients to PCC with nurses and suggested that in order to improve PCC, nurses...
### TABLE 4  Summary of Teaching Techniques applied to improve OHL and PCC

<table>
<thead>
<tr>
<th>Teaching technique</th>
<th>Frequency of study used teaching technique</th>
<th>percentage of study used teaching technique (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback and reflection</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>7 18</td>
</tr>
<tr>
<td>Role-play</td>
<td>✓ ✓ ✓ ✓ ✓ ✓</td>
<td>6 16</td>
</tr>
<tr>
<td>Using simulated patient</td>
<td>✓ ✓ ✓ ✓</td>
<td>5 13</td>
</tr>
<tr>
<td>Lecture</td>
<td>✓ ✓ ✓ ✓</td>
<td>4 11</td>
</tr>
<tr>
<td>Discussion</td>
<td>✓ ✓</td>
<td>3 8</td>
</tr>
<tr>
<td>Face-to-face instruction/demonstration</td>
<td>✓ ✓</td>
<td>2 5</td>
</tr>
<tr>
<td>Coaching for patient</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Debriefing</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Didactic and clinical practice</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Hand-on activities</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Homework</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Interactive display</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Motivation interview</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>NURSE model(^a)</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Self-observation</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Teach back and show me</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>WEMS technique(^b)</td>
<td>✓</td>
<td>1 3</td>
</tr>
<tr>
<td>Total</td>
<td>5 2 3 4 3 3 7 6 5</td>
<td>38 100</td>
</tr>
</tbody>
</table>

\(^a\)NURSE model: Naming, Understanding, Respecting, Supporting and Exploring.

\(^b\)WEMS technique: Waiting, Echoing, Mirroring and Summarising.
should be more concerned with listening to the problems of patients and asking patients as an initial step. The assessment was an important process for teaching PCC. There were many measurement tools to assess PCC which had been researched with more reliability and validity. All assessment tools should include generalisability, responsiveness and interpretability in different contexts such as real patients, simulated doctors and patients in different fields, which also influenced effective PCC. The use of audio and VDO recording could describe the content of communication and could also explore the quality of their interaction. A good relationship between clinicians and patients could improve the quality and efficiency of care. A good relationship was associated with three major factors; interaction styles (e.g., affective connection, openness and sharing content), verbal factors (e.g., greetings and encouraging questions) and non-verbal factors (posture, facial expression and body orientation).

Effective communication will enhance OHL amongst patients and result in a healthy oral status. The results included OHL studies suggested important messages which could be applied for healthcare providers. The OHL assessment tools were Rapid Estimation of Adult Literacy in Dentistry (REALD–30) and Health Literacy in Dentistry (HeLD) which emphasised self-efficacy and was more culturally sensitive than REALD–30. The increase in the OHL of patients significantly decreased plaque scores and also decreased the risk of dental caries and periodontitis. To enhance OHL using a workshop learning programme, the basic oral health information might include oral health-related self-efficacy, oral health-related fatalism, oral health knowledge (such as fluoride uses, dental products), access to dental care and the rights and entitlements of patients.

Feedback and reflection was the most common teaching technique to enhance OHL and PCC in this study. This technique contains two basic teaching techniques (i.e., feedback and reflection) which were used and recommended in clinical settings. The definition of feedback in clinical education is "specific information about the comparison between a trainee's observed performance and a standard, given with the intent to improve the trainee's performance." The purpose of giving feedback is to correct and improve learner's thinking, behaviour and performance. Reflection has been defined as "a process whereby an individual thinks analytically about a clinical situation or activity, monitoring its progress and evaluating its outcome." Reflection aims to aid learner's development and support enhanced performance when similar situations are encountered in the future. Reflection allows reviewing and reordering of concepts, skills and knowledge into pre-existing knowledge structures. Reflection and feedback should be done together by first, the learner makes a self-reflection, and then, the instructor gives feedback. Learners value feedback, especially when given by the person whom they trust and they feel helpful when it is based on their performance and self-reflection which suit their aim. Learning programmes with feedback and reflection enhance deep learning through both the teacher's and learner's experiences.

Role-play widely used for teaching communication in healthcare education. Role-play can be applied to various situations such as different disciplines, the ages and the cultures of learners. Learners experience the assigned role as a healthcare provider before they are in the real situation. For effective role-play, learners must accept the duties and responsibilities of their roles and do their best in the situation.

Clinical simulation using simulated or standardised patients is teaching technique which requires a person who is well trained to portray patients consistently on repeated occasions. Simulated patients is the most common use for teaching communication skills in healthcare education.

Role-play and clinical simulation using simulated patient can be taught simultaneously in cognitive, psychomotor and attitude aspects. They are assessed by direct observation or video recording which provides a powerful means of evaluation and providing effective feedback on the learners' performance in a clinical setting. Feedback and reflection, role-play, and clinical simulation with simulated patients are experiential learning to practise clinical skills.

### 4.1.1 Summary of main results

The methodological quality assessment of included studies was at a high-quality level (>80%) in terms of RCTs design, whilst the quasi-experimental design was 78%. All of the quasi-experiments did not have a follow-up in their studies, which could not determine the retention of the programme. The highest learning programme used to promote OHL or PCC was workshops (50%) and the highest teaching technique, included feedback and reflection (18%). However, there is no single programme to enhance both OHL and PCC, which could research further. The results of teaching techniques supported the idea that a positive feedback and reflection technique was a powerful tool for supporting learning and improving performance. All of the learning programmes used multiple teaching techniques such as lectures, role-playing, simulated patient, feedback and reflection with VDO recording, peers or instructors. All of the techniques were identified to increase health outcomes, except for the work of Fenton, which used the shortest intervention time. They used role-play and simulated patient but did not increase PCC levels. They claimed that they needed intervention time longer than 20 minutes. The study of Helitzer et al provided training and a workshop. Their training contained lectures, role-playing with participants and simulated patients, individual feedback, and optional workshops contained reflective writing and motivational interviews. In their study, they used double follow-ups of 6-12 months each to demonstrate the effectiveness of the programme. Their research design demonstrated the large effect size in this study.

The factor of OHL was important for oral health prevention and promotion. Many studies were focused to increase OHL by training or coaching patients, and some of the smaller studies focused on training healthcare providers. This study, healthcare providers, such as dental hygienists and dental students could enhance the OHL levels of patients using the workshops and rotation techniques, respectively. This model could be applied for non-dental healthcare providers and educators. The healthcare providers...
should teach or support patients to increase their health knowledge and help patients to make suitable treatment decisions. On the other hand, patients should be able to access and understand reliable data on health-related information by themselves and communicate effectively with healthcare providers. The effective communication between healthcare providers and patients is certainly an important interrelationship to enhance their health status.

Patient-centred care can be defined as “respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decision”59 which was determined by the interaction of healthcare providers and patients.60 From this study, the effective PCC could be applied for various health professionals such as physicians,34,39 physician assistants,39 medical students36 and nurses.39 The attainment of PCC caused patients to understand and actively participate in their care, such as choices of treatment and self-management, which resulted in better adherence to medical treatment and improved chronic diseases without paying higher costs.11,24,60 To improve the quality of PCC, all of the stakeholders (policymakers, healthcare organisations and educational institutes) should take their responsibility.60 The effective PCC must be taught systematically at any level of health education with a combination of techniques, apart from lectures, including more frequent practice, constructive feedback and the use of standardised or simulated patients. These techniques were consistent with the results of this review.

The workshop was the only learning programme which enhanced OHL or PCC (Table 3). The feedback and reflection, role-play, lecture and discussion were teaching techniques which were used to enhance OHL or PCC (Table 4). A result of this study suggests the idea that learning programmes and teaching techniques to enhance both OHL and PCC, as follows. Healthcare providers or educators should use PCC to communicate with patients or learners about basic oral health in order to increase OHL of patients or learners through workshops or training. Teaching techniques such as feedback and reflection, role-play, simulation using simulated patient, lecture, discussion, face-to-face instruction/demonstration should be combined and applied according to age, disciplines and culture of healthcare providers/educators and patients/learners.

4.1.2 | Strengths and limitations

The main strength of this study was the methodology used. All of the studies included a high score in terms of quality assessment which yielded a strong31-39 research methodology to conclude the outcomes. The limitations of this study included three quasi-experiments32,33,35 which did not have a follow-up to show the retention of learning programmes and teaching techniques. Approximately 56% of the studies were conducted in the United States of America. This could not be generalised in other parts of the world. The learning programmes and teaching techniques concluded in this review should be used with consideration of the cultural61 and the ethnic62,63 characteristics of the learners.

4.2 | Conclusion

Many learning programmes and teaching techniques identified a variety of learning programmes used in the intervention to enhance the levels of OHL or PCC amongst healthcare providers. There was no single learning programme to enhance both OHL and PCC. The frequently used learning programmes included workshops and training. It was found that all of the learning programmes included in this review used multiple teaching techniques over multiple sessions. The commonly used and most effective teaching techniques to promote OHL and PCC were combinations of feedback and reflection, role-play, simulated patients, theoretical lectures, discussions and face-to-face instruction and demonstration. The period was one of the factors involved in the effectiveness of the learning programme. For each session, the shortest period was 20 minutes. The results of this review might be a guideline for health professional institutes to integrate learning programmes to improve OHL and PCC skills in their course syllabus or continuing education programmes.

4.3 | Practice implication

The results suggested that the most effective learning programmes should combine multiple teaching techniques. There were many commonly applied techniques across all of the studies. The selection of suitable combinations of teaching techniques should be concerned with the context of healthcare culture and healthcare professionals. The feedback and reflection technique could be conducted in a performance review. An increase in the number of follow-ups into the learning programme may increase both effectiveness and the prolonged retention of OHL and PCC skills.

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CONFLICT OF INTEREST

None.

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