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## Review Article

# The effectiveness of interprofessional education in healthcare: A systematic review and meta-analysis

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**Abstract** Interprofessional education (IPE) emphasizes collaborative practice that aims at promoting the working relationships between two or more healthcare professions. However, there is paucity of literature about the effectiveness of IPE program in the healthcare. This systematic review and meta-analysis aims to objectively determine the effectiveness of IPE in that field in terms of the improvement of students' knowledge, skills and attitudes. The databases of OVID, ISI Knowledge of Science, and Medline (PubMed) were searched for the full-text English language articles published during 2000–2016 using the MeSH terms "interprofessional education" AND "healthcare professionals" AND "multi-professional" AND "impact" AND "effectiveness" OR "collaborative practice" OR "medical students" in Endnote X7. A systematic search finally selected 12 articles for detailed review and meta-analysis. The effect summary value of 1.37 with confidence interval of 0.92–1.82 identifies statistically significant effectiveness of intervention by IPE program in healthcare. The Z test value of 5.99, significant at 5% level of significance, also shows a significant impact of IPE intervention as calculated by the random-effects model. This meta-analysis shows a positive impact and effectiveness of educational intervention by IPE program in various disciplines of healthcare. However, analysis of further clinical trials may be helpful in identifying the effect of IPE program on the students' clinical competence.

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## Introduction

Interprofessional education (IPE) refers to “occasions when two or more professionals learn with, from and about each other to improve collaboration and the quality of care” [1]. This contrasts with multi-professional education where health professionals learn alongside one another in a parallel manner [2]. Several studies have shown that IPE promotes interdisciplinary collaboration and teamwork [3,4], reduces the barriers and preconceptions prevailing among various healthcare groups and promotes professional competencies [5]. This approach of engaging multiple health workers from different professional backgrounds working together with patients, families and communities has been shown to provide the highest quality of patient care [6]. Literature is deeply divided about a standard teaching pedagogy that can be successfully tailored to match goal setting and desired outcomes of an IPE program [7]. Some researchers have argued that a standard IPE module can be delivered during pre-qualification [8], while others have indicated that it can be taught both before and after qualification [9]. In the quest for a standard educational strategy, Freeth et al. have coined a five-point taxonomy of IPE learning strategies; problem-based, exchange-based, simulation-based, observation-based and practice-based [10]. Traditionally, the Interdisciplinary Education Perception Scale IEPS has been tested as an instrument to objectively evaluating the students’ attitudes before, during and after incorporating IPE programs [11]. However, this instrument has been used to measure one or more IPE-based outcomes as outlined by Freeth et al.; practice-based learning [12], problem based learning [4] or simulation-based learning [13].

The complexity of teaching dynamics in different healthcare disciplines poses special challenges to the introduction of IPE modules such as crowded timetables and the logistical problems related to large numbers of students required to undertake same learning activities simultaneously [14]. However, several accreditation bodies have embedded interprofessional educational strands within their educational domains, prompting a growing number of medical curriculum committees to explore the possibility of introducing and developing IPE in their institutional practice [15]. However, there are limited reports in literature that have elaborated the effectiveness of IPE teaching in pre-post status of various healthcare disciplines. This systematic review and meta-analysis objectively analyses the effectiveness and impact of teaching and developing IPE modules in healthcare. This may provide an insightful stimulus to educators for the development and incorporation of IPE in healthcare system.

## Materials and methods

### Search design

This systematic review and meta-analysis was conducted to explore the impact of interprofessional education (IPE) in healthcare using OVID, ISI Knowledge of Science, and Medline (PubMed) database. The Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) protocol

[16] were applied in selecting those articles that used empirical pre-post design criteria in exploring the impact of IPE in healthcare system with reported average and standard deviation. In April 2017, the full-text English language articles published during 2000–2016 were searched by connecting MeSH major topic terms of “interprofessional education” AND “healthcare professionals” AND “multi-professional” AND “impact” AND “effectiveness” OR “collaborative practice” OR “medical students” in Endnote X7. This search initially retrieved 8453 citations as shown in Figure. 1. Only the pre-post original studies were included that compared the effectiveness of IPE by quantitative analysis. Review and editorial articles, commentaries, personal opinions, and conference proceedings were excluded from this review.

### Quality assurance

Two independent reviewers objectively reviewed the selected studies and reached consensus by matching the inclusion criteria and key words. The barriers and challenges in the published articles were identified and then the differences were discussed until consensus was reached and concerns were resolved. In addition, controversies and disparities during selection of studies were resolved by general consensus among researchers.

### Data extraction

During the data synthesis, 7133 studies were excluded due to duplication and publication prior to 2010. Another 1253 studies were excluded after reviewing the titles and abstracts as these studies did not meet the inclusion criteria. While only 55 studies were found to be relevant as they empirically explored the effectiveness of IPE on healthcare system. During the full text analysis of these 55 relevant studies, another 43 articles were excluded due to inappropriate data for meta-analysis. This meta-analysis and systematic review finally selected 12 relevant studies that matched the inclusion criteria of this study.

The following 12 studies were finally selected for this meta-analysis;

- Examining the influence of professional identity formation on the attitudes of students towards interprofessional collaboration [17].
- Effectiveness of interprofessional education by on-field training for medical students, with a pre-post design [6].
- Minding the gap: interprofessional communication during inpatient and post discharge chasm care [18].
- Building interdisciplinary research models through interactive education [19].
- Teaching the teachers: faculty development in interprofessional education [20].
- Getting a head start: high-fidelity, simulation-based operating room team training of interprofessional students [21].
- An interprofessional communication training using simulation to enhance safe care for a deteriorating patient [22].

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