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Scoping Review
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Scoping Review: Why is Public Health Integrated into Medical Education?

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ABSTRACT

Background: Medical students who get community-involved medical education will be better equipped to address the health needs of their communities by integrating public health services into their practice. The importance of public health disciplines for physicians needs to be reinforced in the medical curriculum. Many studies, findings, and discussions report on the importance of this integration. This study aims to identify, decipher, and map the available scientific evidence regarding the importance of public health integration in medical education.
Subjects and Method: This was a scoping review study using PUBMED, ProQuest, SCOPUS, Google Scholar, and other related sources. The keywords used in article searches are as follows: "public health" AND "medical education" OR "support" OR "against" OR "proportion" OR "role". From the database used, 1,775 articles were obtained and those who met the criteria were 45 articles.
Results: The results were presented in three sub-discussions, namely role, perception, and form of integration. 1) Role: doctors are able to facilitate individual health and address public health problems through health promotion, health policy, evidence-based medicine practices, improving the quality of health data and health services; 2) Perception: Both positive and negative perceptions were reported in these integration-related findings; and 3) Form of integration: public health collaboration in medical education is carried out at the academic and professional stages of doctors.
Conclusion: The importance of integrating public health principles into medical education is to encourage the formation of doctors who act as doctors in the curative department as well as public health experts who understand community problems and can address them holistically and comprehensively.

Keywords: perception, role, integration, public health, medical education, scooping review

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BACKGROUND

Medical science has a primary focus on the individual patient. In public health, the focus is on population health with reference to diseases found in individuals. Medicine refers primarily to the biological sciences, with a secondary emphasis on quantitative sciences, physics, chemistry, and parts of engineering. Public health relies on a spectrum of disciplines centered on quanti-

tative and socio-behavioral sciences, and originates in engineering and environmental sciences as well as biological sciences. Public health emphasizes on disease prevention, whereas medicine deals with the prevention, diagnosis, and treatment of individuals. Medication, surgery, and other forms of individual intervention are the main tools of medical medicine. Public health uses a wide array of social and community interventions ranging from immunization campaigns to urban design to safeguard and protect health (Harvey et al., 2011; Whelan & Black, 2007).

Public health and medicine face health and healthcare challenges from different and complementary perspectives. In medicine, the focus is on individual patients, in family and community contexts. In public health, the focus is on public health, with the expression of disease found in the lives of individuals. Medicine primarily refers to the biological sciences, with a secondary emphasis on quantitative sciences, physics, chemistry, and engineering sections. Public health relies on a spectrum of disciplines centered on quantitative sciences and social behavioral sciences, and originates in engineering and environmental sciences as well as biological sciences. Public health emphasizes on disease prevention, whereas medicine is concerned with the prevention, diagnosis, and treatment of individuals. Medication, surgery, and other forms of individual intervention are the primary tools of medical doctors. Public health implements a wide range of social and community interventions ranging from immunization campaigns to urban design to safeguard and protect health (Fineberg, 2011; Johnson et al., 2020).

The management of health services today is more oriented towards the sick paradigm or curative services, compared to the healthy paradigm or promotive and preventive efforts. This can be seen from the high health costs incurred by the government for health services received by the public in hospitals (KKI, 2019). Preventive medicine, which is often the most cost-effective medical approach, is becoming mandatory to contain the rising costs of treating chronic diseases. For many years, public health science was a marginalized discipline in medical education. Several organizations including the Association of American Medical Colleges, the Institute of Medicine (IOM), and the United Kingdom General Medical Council (GMC) have emphasized the importance of undergraduate medical training in the field of public health (Finkel, 2012; Riegelman & Garr, 2008; Schapiro et al., 2011). They Calling for medical education to integrate the basic competencies of public health by recognizing that traditional biomedical models fail to address factors related to the multifactorial societal context regarding health and well-being. Consistent efforts to incorporate socio-ecological, nutrition education, and prevention perspectives into medical school curricula are an important next step (Allan et al., 2004; Chamberlain et al., 2008; Simoyan et al., 2011; Trevena et al., 2005).

Awareness has grown over the past 2 decades, the importance of public health disciplines for physicians, and the need to embed public health competencies on the medical curriculum (K. Koo & Lapp, 2014). The Consensus Conference on Undergraduate Public Health Education advocates that all undergraduate medical students have access to public health education. The Association of American Medical Colleges and the Healthy People Curriculum Task Force published recommendations to include a public health curriculum as part of 4 years of medical training (Riegelman & Garr, 2008). The Indonesian Doctor Competency Standard (SKDI) also conveys that the

minimum curriculum that must be in the Faculty of Medicine is to formulate and include contributions to public health, preventive medicine and community medicine (KKI, 2019).

Many scientific publications published to date related to the importance of public health in medical education. Therefore, study related to scoping reviews that can describe perceptions that support and reject the existence of public health curricula, the proportion, role, and importance of public health in medical education is important. The purpose of this study is to identify, decipher, and map the available scientific evidence regarding the importance of public health integration in medical education.

SUBJECTS AND METHOD

1. Study Design

This study method is *scoping review*. This study will be conducted by searching and selecting study data conducted across ethnicities, races, and locations in the world.

2. Population and Sample

The article used does not use a specific time frame criterion so that all relevant study can be included. The articles used in this study were obtained from several electronic data bases, including: PUBMED, ProQuest, SCOPUS, Google Scholar, and other related sources. The keywords used in article searches are as follows: "public health" AND "medical education" OR "support" OR "against" OR "proportion" OR "role". Articles reviewed are all articles published (no time limit), using Indonesian or English, available full text, and specific to the studyer's questions that are the focus of the review.

3. Study Variables

This study aims to identify, decipher, and map the available scientific evidence regarding the importance of public health integration in medical education which is discussed in the context of roles, perceptions, and forms of integration.

4. Study Instruments

The study instrument used to collect articles is the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Figure 1).

5. Data Analysis

The articles found are collected in tables manually and summarized the results to then be grouped according to topic descriptively.

RESULTS

It was found that 1,755 articles had passed the duplication filter. After screening and removing duplicates, a total of 751 articles were obtained. Based on eligibility criteria, titles, and abstracts were obtained so that 1,004 publications were retained. The full text of the remaining publications amounts to 118. A total of 45 publications were included in the scoping review. Many of the publications included were from publications published in 2011. The reviewed publications report several reasons for the importance of public health integration in medical education. The importance of this integration is elaborated in the context of the roles, perceptions, and forms of public health integration in medical education.

1. Role

Many articles report on the important role of the integration of public health education in medical education for future physician candidates. In general, the role in question is that the doctor is able to contribute to:

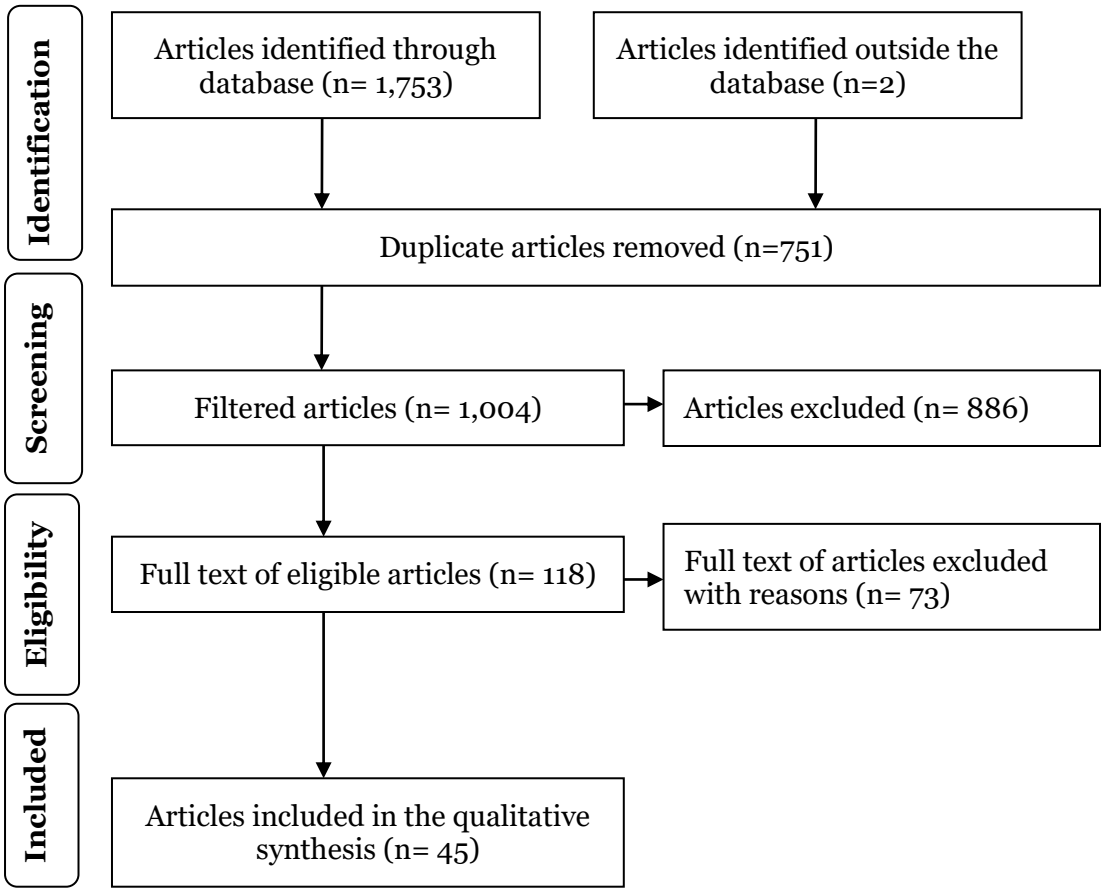

Figure 1. Scoping review selection using PRISMA flow chart

a. Providing health services for individuals and communities

The first role of physicians is to continue their traditional task of caring for patients at the individual level (Rao et al., 2020). Physicians serve as primary health care providers and public health practitioners to improve individual health and community health (Punzalan et al., 2023). The integration of public health in medical education has the potential to produce physician graduates who meet the growing need for doctors who understand public health medicine (Bell et al., 2019a). Many doctors will find that public health is a continuation of treatment in other ways, potentially affecting millions of people at a time (Fineberg, 2011; Gillam & Maudsley, 2008). The integration of public health into the practice of medicine supports graduate physicians acquire competencies that enable them to effectively run primary health and public health practices in areas of greatest need (Punzalan et al., 2023).

b. Improve the quality of healthcare

Clinicians who understand their role in the wider context of individual and societal health that will influence the planning and organization of health services (Gillam & Maudsley, 2008). Doctors have the ability to address health disparities and healthcare problems (Johnson et al., 2020). Clinicians are expected to ensure that the development and delivery of healthcare interventions benefits patients and supports interventions that can bring change to society (Gillam & Maudsley, 2008). Physicians then have the principles and practices of public health needs assessment, health service planning, resource

allocation, health service evaluation, and are involved in national health services (Gillam & Maudsley, 2008).

c. Recommending healthy behaviors through health promotion

Doctors will maximize their role in disease prevention and promotion of healthy lifestyles (Dankner et al., 2018). Preparing physicians as medical professionals in health promotion and disease prevention is considered an important step for better health services for individuals and communities (Kershaw et al., 2017). Clinicians will be able to play a role in the discussion of principles and practices of health promotion and disease prevention through disease control (Gillam & Maudsley, 2008).

d. Influencing health policy in a broader response

Physicians will play a member role in the broader response to emerging threats as frontline members during short-term crises such as COVID-19 (Rao et al., 2020). Health education and policy are important and should be improved in medical education programs. Some experts have called for increased involvement of aspiring physicians in public health (Leonard et al., 2023). Physicians are expected to have the ability to advocate for public health policies, programs, and infrastructure that will improve and protect the health of patients and society at large. Sometimes government policies on public health and health-related policies can be political so doctors may be hesitant to get directly involved (Maeshiro & Carney, 2020).

e. Supports improved health data quality

Physicians and healthcare providers will increasingly be part of digitizing healthcare information in data collection, data set management, communication with administrative leaders, and involvement in statistical analysis (Rao et al., 2020). However, developing statistics teaching to meet the needs of future physicians will be challenging because it will not be easy. This is due to the dense medical curriculum with a large group of students and increasingly broad abilities (Miles et al., 2010).

f. Maximizing evidence-based medicine interventions

Clinicians will have the curiosity, motivation, and competence to obtain the evidence-based information they need to provide scientific care to patients (Dankner et al., 2018). Patient care and public health in evidence-based clinical medicine practice can use epidemiology skills (Gillam & Maudsley, 2008).

2. Perception

The integration of public health in medical education received many responses from the medical education community who underwent the process. Some of these responses are judged as positive and negative perceptions.

a. Positive Perception

Agree with the integration of primary health and public health

Most medical students agree that individual health and public health services are integrated through community activities as designed by the curriculum. The ability to integrate primary and public health care into practice will help address health disparities as primary health care providers treat each patient with the broader health system in mind, and public health practitioners implement programs and policies with consideration for how this may impact each patient (Punzalan et al., 2023). The involvement of patients, clinical lecturers, public health officials, and community leaders in these cases not only demonstrates the importance of partnerships with medical students, but also demonstrates to the community that medical schools are

investing in addressing public health issues collaboratively (Schapiro et al., 2011).

Public health sciences are useful in the practice of medicine

Study on public health perceptions in medical education has found that students feel that health promotion projects have a positive impact on the development of their knowledge and skills. The majority of students strongly agree or agree that public health projects in this regard health promotion help in developing their skills in communication, teamwork, and study, as well as their understanding and interests (Kershaw et al., 2017).

b. Negative Perception

Student interest and motivation are considered still lacking

Despite community-based learning, students' interest and motivation to study public health is lacking. Students tend to prioritize medical clinical material over public health. Students are also less likely to choose public health as a career choice (Navinan et al., 2011). Physicians and educators who do not have expertise in public health are less likely to perceive public health content as relevant to future physician education (Mahoney et al., 2011).

Lack of student confidence related to readiness to understand and participate

Medical students reported an interest in public health and health policy, but also reported a lack of confidence in their level of readiness to understand and participate in these areas. There needs to be an increase in public health education and health policy in the medical school curriculum (Leonard et al., 2023). One of the recommendations of practicing clinicians is to affirm the relevance of statistical and study methods, as well as design curricular content and delivery methods to illustrate this point (Miles et al., 2010).

3. Forms of Integration

The form of public health integration is carried out in the stages of medical education, academic stage, and professional stage.

a. Academic/ preclinical stage

Integrating public health practices into the medical curriculum through a project-based learning component is an innovative way to encourage active learning (Kershaw et al., 2017). The integration of public health sciences that are generally emphasized in the academic / preclinical stage of medical education are as follows.

Basic epidemiology

Improve students' ability to understand and interpret epidemiological studies. The fundamentals of biostatistics and epidemiology are taught together, highlighting the relevance of these two disciplines to the understanding and interpretation of medical data (Dankner et al., 2018). It is very important to understand the causes and distribution of the disease. No physician can hope to interpret the medical literature independently if it does not have a foundation in the quantitative disciplines of biostatistics and epidemiology (Fineberg, 2011).

Behavioral and health promotion

Medical students in their curriculum must learn related to disease prevention, health promotion, and nutrition. Another recommendation is to include a self-paced course on public health, including socio-ecological determinants, health frameworks, and behavior change strategies (Rao et al., 2020). Through health promotion, students can communicate and market a healthy lifestyle to patients and gain knowledge about the impact of health-supporting environments on the implementation of a healthy lifestyle (Dankner et al., 2018). Public health teaches the influence of environmental, nutritional, social, and

behavioral factors on health, disease, recovery, and well-being. Understanding disease etiology and optimal patient management depends on a comprehensive understanding of the various origins of disease, including diseases traditionally emphasized in public health (Fineberg, 2011; Preston et al., 2011).

Evidence Based Medicine (EBM) Practice

Students should be able to construct clinical questions based on specific clinical situations, search medical literature, obtain the most relevant material, and critically assess literature to achieve the best available solution (Dankner et al., 2018). The medical curriculum should be relevant to the needs of the time and should address public health issues. All resources in hospitals related to medical schools and community environments should be utilized as learning resources in a needs-based and community-oriented medical curriculum (Barman, 2014).

Health study: data processing and statistics

A student's study project or scientific paper provides an opportunity to develop their understanding of statistics from its interpretation to its implementation. However, whether all students need to be taught the details of all statistical tests is questionable. Guidance and advice from medical statisticians may be more appropriate to enable students to adequately conduct statistical analysis for the needs of their particular study project (Miles et al., 2010). Courses may be designed to equip students with the competencies necessary to develop study questions and formulate relevant study methodologies (Dankner et al., 2018). Increase or reprioritize study funding for student study programs and residencies to make them more likely to be rewarded for sound equity study and social drivers of health (Rao et al., 2020).

Health policy

The curriculum throughout the medical education suite should include an explanation of the public health system, physicians' responsibilities to local and state government public health agencies, and opportunities for collaboration. Medical education should also prepare physicians to advocate for public health policies, programs, and funding to improve and protect the health of patients and their communities (Maeshiro et al., 2011; Maeshiro & Carney, 2020). Epidemiology methods in clinical decision-making will provide an epidemiological background on major body organs and systems taught in the third and fourth years, while focusing on how epidemiology is used for clinical decision-making (Dankner et al., 2018).

b. Professional / clerkship level

Public health integration is carried out at the profession/registrar stage where students concentrate on community perspectives on medical care and is carried out through a series of lectures and interactive case discussions on health in hospitals, delivery of health-related information, doctors' social responsibility, and community aspects. Impact on clinical management outcomes (Godfrey et al., 2019; Navinan et al., 2011). At this stage, students will develop innovative mechanisms related to public health so that risk reduction practices are financially valued in primary care. This integrative approach also shows students that all doctors, not just public health specialists, should understand public health subjects (Brill et al., 2011; Mahoney et al., 2011; Rao et al., 2020). During the professional/clerkship stage, medical students will use their public health science in terms of: (Bell et al., 2019b; Dankner et

al., 2018; Fineberg, 2011; D. Koo & Thacker, 2008; Ornt et al., 2008):

1) Critically assess data on both epidemiology and biostatistics
2) Providing quality healthcare solutions
3) Answering individual and community health medical problems based on evidence-based medicine
4) Provide practical advice to individuals and to advocate for patient rights and health equity in the community.
5) Analyze exciting and fulfilling physician career opportunities in areas such as global health, disaster response, health policy, and environmental health
6) Have the ability to use clinical and epidemiological competence to understand the various considerations involved in health policy at the individual and population level

Doctors with a touch of public health and community medicine are able to treat individual patients, families, and communities to the community.

DISCUSSION

Role

A pool of knowledge and skills related to aspects of public health is critical to the future workforce of physicians. Recent findings suggest that medical faculties vary widely in achieving goals related to the social mission of medicine (Stebbins et al., 2011). Some examples are primary care physicians, family medicine, tourism health, marine medicine, and so on. In essence, the integration between medical science and public health results in benefits for both parties. Public health systems and clinical services and professionals operate in parallel rather than synergy. Public health sciences play an important role in healthcare delivery, providing data and providing guidance for infection control, testing, and clinical care in all environments, from laboratories to emergency medical services and home care (Maeshiro et al., 2010; Maeshiro & Carney, 2020). The once distinct fields of public health and medicine are slowly merging and reintegrating. Public health principles of community intervention and partnerships to affect better population health are included in the curriculum of more medical schools (Crandall, 2011). Key lessons learned include the importance of accessing resources outside of residency programs and the challenges of making learning in health and public health systems active and relevant to clinical practice (Fiebach et al., 2011).

Perception

Over the past few decades, recommendations to improve the integration of public health in medical education have been widely emphasized as necessary to meet public health needs. In ancient times, integrating public health into medical school curricula still posed major challenges. Educators have previously described issues related to improving public health content in medical curricula and have suggested methods to help achieve this (Anderson, 1999; Pomrehn et al., 2000; Sachdeva, 2000). Students tend to prioritize medical clinical material over public health. Students are also less likely to choose public health as a career choice (Navinan et al., 2011).

This perception is discussed in relation to the response of prospective doctors when attending public health education. Most medical students give a positive perception that agrees with this integration and benefits from it. But some negative perceptions also emerge that indicate obstacles in terms of acceptance and implementation. Student interest and motivation are considered to be still lacking and low student confidence related to

readiness to understand and participate (Kershaw et al., 2017; Leonard et al., 2023; Navinan et al., 2011; Punzalan et al., 2023; Schapiro et al., 2011; Stebbins et al., 2011).

Forms of integration

Medical faculties at several universities in the world launched curricular transformations with the vision of incorporating public health as an integral component of medical education applied at the academic to professional stages. This reflects the goal of bridging the divisions that have separated medicine and public health. Providing excellent medical care alone is important but not a sufficient requirement to improve public health (Geppert et al., 2011). The elimination of health disparities and the improvement of the health of all members of society are now foundational elements of the mission of education, study, and clinical practice (Berwick & Finkelstein, 2010; Campos-Outcalt, 2011; McNeal & Blumenthal, 2011). The role of physicians and community leaders is positive, engages them in addressing complex community and public health issues, and encourages them to consider primary care or subspecialty medical careers serving underserved populations (Haq et al., 2013).

The integration of public health into medical education is important because it can lead to the formation of doctors who not only focus on curative parts, but on promotion and prevention, mastering statistical data, policy interventions, to be able to address individual and community problems holistically and comprehensively. The proportion of the public health curriculum should be discussed, so the students will not be burdened.

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CONFLICTS OF INTEREST

The author declares that they have no conflict of interest.

REFERENCE

Allan J, Barwick TA, Cashman S, Cawley JF (2004). Clinical prevention and population health: curriculum framework for health professions. Am J Prev Med. DOI: 10.1016/j.amepre.2004.-08.010.

Anderson MB (1999). Contemporary issues in medicine medical informatics and population health: Report II of the medical school objectives project. Academic Medicine. 74(2): 130–141. DOI:10.1097/00001888-199902000-00012.

Barman A (2014). Public health in undergraduate medical education. South East Asia J Public Health. 4(2):1–1. DOI:10.3329/SEAJPH.V4I2.23687

Bell C, Simmons A, Martin E, McKenzie C, McLeod J, McCoombe S (2019). Competent with patients and populations: integrating public health into a medical program. BMC Medical Education. 19(1): 179. DOI:10.1186/s12909-019-1635-6

Berwick DM, Finkelstein JA (2010). Preparing medical students for the continual improvement of health and health care: Abraham Flexner and the new “public interest”. Acad Med, 85(9): S56–S65. DOI:10.1097/acm.-

0b013e3181ead779.

Brill JR, Chheda SG, Rusch RB, Seibert CS (2011). A mapping process for identifying and enhancing public health education in required medical student clerkships. Am J Prev Med. 41:S304–S305.

Campos-Outcalt, D. (2011). The integration of public health and prevention into all years of a medical school curriculum. Am J Prev Med, 41, S306–S308. DOI: 10.1016/j.amepre.2011.-06.012.

Chamberlain LJ, Wang NE, Ho ET, Banchoff AW, Braddock C, Gesundheit N (2008). Integrating collaborative population health projects into a medical student curriculum at Stanford. Academic Medicine. 83(4): 338–344. DOI:10.1097/ACM.0B013-E318166A11B.

Crandall ML (2011). Integrating population health into a general surgical residency curriculum. Am J Prev Med. 41: S276–S282. DOI:10.1016/j.amepre.-2011.06.026.

Dankner R, Gabbay U, Leibovici L, Sadeh M, Sadetzki S (2018). Implementation of a competency-based medical education approach in public health and epidemiology training of medical students. Israel Journal of Health Policy Study. 7(1), 1–8. DOI:10.118-6/S13584-017-0194-8.

Fiebach NH, Rao D, Hamm ME (2011). A curriculum in health systems and public health for internal medicine residents. Am J Prev Med. 41:S264–S269. DOI: 10.1016/j.amepre.2011.-05.025.

Fineberg HV (2011). Public Health and Medicine: Where the Twain Shall Meet. American Journal of Preventive Medicine. 41(4):S149–S151. DOI:10.-1016/J.AMEPRE.2011.07.013.

Finkel ML (2012). Integrating the Public Health Component into The Medical School Curriculum. Public Health Reports. 127(2): 145. DOI:10.1177/00-3335491212700201.

Geppert CMA, Arndell, CL, Clithero A (2011). Reuniting public health and medicine: the University of New Mexico School of Medicine Public Health Certificate. Am J Prev Med. 41:S214–S219. DOI: 10.1016/j.amepre.2011.06.001.

Gillam S, Maudsley G (2008). Public health education for medical students: Rising to the professional challenge. Journal of Public Health. 32(1):125–131. DOI:10.1093/pubmed/fdp108.

Godfrey S, Nickerson K, Amiel J, Lebwohl B (2019). Development of an online public health curriculum for medical students: the public health commute. BMC Medical Education. 19(1):298. DOI:10.1186/s12909-019-1734-4.

Haq C, Stearns M, Brill J, Crouse B, Foertsch J, Knox K, Stearns J, Skochelak S, Golden R N (2013). Training in urban medicine and public health. Acad Med. 88(3): 352–363. DOI:10.1097/-acm.0b013e3182811a75.

Harvey BJ, Moloughney BW, Iglar KT (2011). Identifying public health competencies relevant to family medicine. Am J Prev Med. 41:S251–S255. DOI: 10.1016/j.amepre.2011.06.002.

Johnson SB, Fair MA, Howley LD, Prunuske J, Cashman SB, Carney JK, Jarris YS, et al. (2020). Teaching Public and Population Health in Medical Education: An Evaluation Framework. Academic Medicine. 1853–1863. DOI: 10.1097/ACM.0000000000003737.

Kershaw G, Grivna M, Elbarazi I, AliHassan S, Aziz F, Al Dhaheri AI (2017). Integrating public health and health promotion practice in the medical curri-

culum: A self-directed team-based project approach. Frontiers in Public Health. DOI:10.3389/FPUBH.2017.-00193.

KKI (2019). Standar Pendidikan Profesi Dokter Indonesia. Konsil Kedokteran Indonesia, 169.

Koo D, Thacker SB (2008). The education of physicians: the CDC perspective. Acad Med, 83, 399–407.

Koo K, Lapp I (2014). On Academics: Educating the Next Generation of Physicians in Public Health: The MPH for Medical Students. 129(5):460–464. DOI:10.1177/00333549141290-0511.

Leonard SM, Dixon KS, Ayres JM, Cordner K, Greiner KA, Parente DJ (2023). Perceived Value of Public Health and Health Policy Information Among Medical Students: A Cross-sectional Study. PRiMER. 7: 1–9. DOI:10.2245-4/primer.2023.758379.

Maeshiro R, Johnson I, Koo D (2010). Medical education for a healthier population: reflections on the Flexner Report from a public health perspective. Acad Med, 85, 211–219.

Maeshiro R, Koo D, Keck C (2011). Integration of public health into medical education: an introduction to the supplement. Am J Prev Med, 41, S306–S308.

Maeshiro, Rika, Carney JK (2020). Public Health Is Essential: COVID-19's Learnable Moment for Medical Education. Academic Medicine. 1799–1801. DOI:10.1097/ACM.00000000-00003517.

Mahoney JF, Fox MD, Chheda SG (2011). Overcoming challenges to integrating public and population health into medical curricula. Am J Prev Med. 41:S170–S175. DOI: 10.1016/j.amepre.2011.06.025.

McNeal MS, Blumenthal DS (2011). Innovative ways of integrating public health into the medical school curriculum. Am J Prev Med, 41, S309–S311. DOI: 10.1016/j.amepre.2011.-06.013.

Miles S, Price GM, Swift L, Shepstone L, Leinster SJ (2010). Statistics teaching in medical school: Opinions of practising doctors. BMC Medical Education 2010 10:1. 10(1):1–8. DOI:10.11-86/1472-6920-10-75.

Navinan MR, Wijayaratne DR, Rajapakse S (2011). Final-year medical students perceptions regarding the curriculum in public health. Indian Journal of Community Medicine. 36(4): 268–274. DOI:10.4103/0970-0218.91328.

Ornt DB, Aron DC, King NB (2008). Population medicine in a curricular revision at Case Western Reserve. Acad Med. 83: 327–331. DOI: 10.1097/-ACM.0b013e318166ab8a.

Pomrehn PR, Davis MV, Chen DW (2000). Prevention for the 21st century: setting the context through undergraduate medical education. Academic Medicine. 75(7):S5-13. DOI: 10.-1097/00001888-200007001-00002.

Preston C, Almashat S, Peik S, Desale M, Alexander M (2011). Role of preventive medicine residencies in medical education: a national survey. Am J Prev Med. 41:S290–S295. DOI: 10.10-16/j.amepre.2011.06.021.

Punzalan JK, Guingona M, Punzalan MG, Cristobal F, Frahsa A, Liwanag HJ (2023). The Integration of Primary Care and Public Health in Medical Students' Training Based on Social Accountability and Community-Engaged Medical Education. Int J Public Health. 68(January). DOI:10.-3389/ijph.2023.1605359.

Rao R, Hawkins M, Ulrich T, Gatlin G,

Mabry G, Mishra C (2020). The Evolving Role of Public Health in Medical Education. Frontiers in Public Health. 8: 251. DOI:10.3389/-fpubh.2020.00251.

Riegelman RK, Garr DR (2008). Evidence-based public health education as preparation for medical school. Academic Medicin. 83(4): 321–326. DOI:10.10-97/ACM.0B013E318166ABE7.

Sachdeva AK (2000). Faculty development and support needed to integrate the learning of prevention in the curricula of medical schools. Academic Medicine : Journal of the Association of American Medical Colleges. 75(7). S35-42. DOI: 10.1097/00001888-200007001-00006.

Schapiro R, Stickford-Becker AE, Foertsch JA, Remington PL, Seibert CS (2011). Integrative Cases for Preclinical Medical Students: Connecting Clinical, Basic Science, and Public Health Approaches. American Journal of Preventive Medicine. 41(4). S187–S192. DOI:10.1016/J.AMEPRE.2011.-06.004.

Simoyan OM, Townsend JM, Tarafder MR., DeJoseph D, Stark RJ, White MV (2011). Public health and medical education: a natural alliance for a new regional medical school. Am J Prev Med, 41, S220–S227. DOI: 10.1016/-j.amepre.2011.05.027.

Stebbins S, Sanders JL, Vukotich CJ, Mahoney JF (2011). Public health area of concentration: a model for integration into medical school curricula. Am J Prev Med, 41, S237–S241. DOI: 10.1016/j.amepre.2011.-06.020

Trevena LJ, Sainsbury P, Henderson-Smart C, Clarke R, Rubin G, Cumming R (2005). Population health integration within a medical curriculum: An eight-part toolkit. American Journal of Preventive Medicine. 29(3): 234–239. DOI:10.1016/J.AMEPRE.2005.-05.008.

Whelan A, Black D (2007). Integrating Public Health and Medicine: First Steps in a New Curriculum. Education for Health, 20(3), 122. DOI: 10.4103-/1357-6283.101598.