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Integrating Evidence Seeking with Rural Community Health Clerkship and Primary Care: SPICE Model

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Abstract

Objective: 1) To pilot test the integration of evidence seeking with rural community health clerkship rotation by 4th year undergraduate medical students in a medical college.

2) To explore the category of evidence gathered by the students during the two month clerkship.

Methods: The students of 4th year medical college was involved in a new skill where we pilot tested the integration of evidence seeking with rural community health clerkship using our innovative SPICE model (Integrating Evidence Seeking with Primary care & Community Health). The clerkship was supervised by the faculty of Community health sciences of the medical college in collaboration with primary health care physicians of the rural health centre. The students were provided a format for exploring queries related to the patients that were assigned to them. The students were given library time in the afternoon to look for answers to their queries from the resource list provided to them. The students presented their findings in the bi-weekly morning meeting in the rural community clinic. The meeting was attended by the four supervisors, primary care physicians and other students involved in the clerkship.

Results: There were 105 queries made by the students during their 2 months community health clerkship with an average of 5 queries per student. 70% of the queries were related to General Medicine, followed by Gynecology/ Obstetrics, Psychiatry and pediatrics. Surgery related queries accounted for only 2% of the queries. Classification of queries in to various categories showed that prevention related queries were the highest (40%), followed by curative (37%). Epidemiological queries (Association, causation, incidence/prevalence) together accounted for about 17% of the queries.

Conclusion: Integration of evidence seeking with rural community health clerkship rotation by 4th year undergraduate medical students in a medical college was successfully pilot tested, developing the SPICE model, and found to be objectively designed, practically feasible, learner centered and liked by the students and the faculty members involved in the study. The pilot test results are highly supportive of adopting this model in the training curriculum of undergraduate medical education throughout the country.

Keywords: SPICE model; Community health sciences; Rural community health clerkship; Primary health care

Introduction

Pakistan with a population of 185 million is the sixth most populous country in the world where 64% of its population lives in rural areas [1,2]. Pakistan's health profile is characterized by a dual burden of communicable and non-communicable diseases, high fertility, low life expectancy, a young age structure, high maternal and child mortality, high incidence of infectious and communicable diseases [3]. Inequities in health services provision is evidenced by the fact that there were excess of 25 neonatal, 34 infant and 41 under-five deaths per 1000 live births in the poorest quintile of wealth index compared with the richest [4].

The healthcare system, including financial resource allocation, infrastructure development, and development of referral system and training of medical, technical and paramedical staff should, therefore, be designed to cater to the needs of the people living in the rural areas. However, this is not the case, as the majority of undergraduate medical colleges in Pakistan are situated in the urban areas. The students in these colleges are trained in tertiary healthcare centers situated in the cities where advanced diagnostic and therapeutic facilities are readily available. Moreover the spectrum of disease that the students see in the cities are quite advanced and, hence, the students are not trained to detect the diseases in the early stages, and the concepts of primordial prevention, primary and secondary prevention are not their priority learning experiences. This is the 'inverse care' that is the norm in Pakistan, meaning that those who deserve the most of the healthcare get the least [5].

Majority of undergraduate and post-graduate medical training

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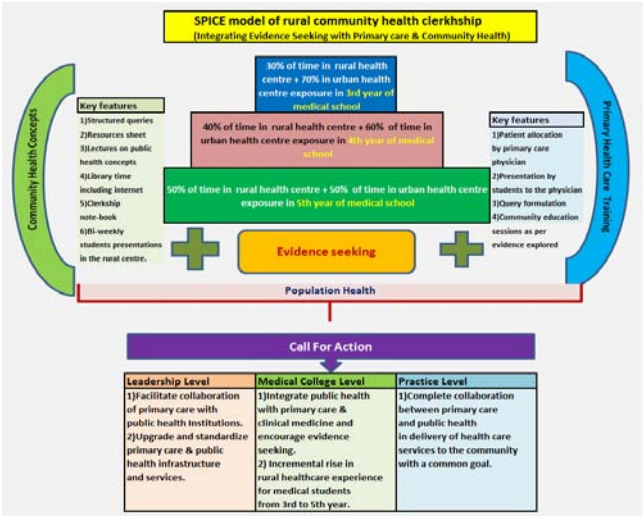

Figure 1: Integrating evidence seeking with rural community health clerkship and primary care: SPICE model.

is focused on the health needs of 36% of the population and we fall short to train our future doctors on the health problems of 64% of the population [5]. Primary Health Care (PHC) was defined at the First International Conference on Primary Care at Alma-Ata in 1978 as "essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation [6]. "Primary care requires team of health professionals: physicians, nurse practitioners and assistants with specific and sophisticated biomedical and social skills. It is not acceptable that in low-income countries primary care would be synonymous with low-tech, non-professional care for the rural poor who cannot afford any better" [7].

It is critical that PHC be understood as a community focus in health care that differs from a focus on individuals. The greater understanding there is of PHC, the better it can be implemented, especially in less developed nations [8].

Applying the latest evidence in taking care of the patients was the reason for providing the new resources to the students in this SPICE model. Previously there was no clerkship in the rural clinic instead there was one time visit to the rural community to do house-hold Knowledge, Attitude and Practices (KAP) survey. This was the first time rural clerkship was initiated and it was integrated with evidence seeking and the resources (Online resources, library time, dedicated faculty time from community health sciences and primary care, case presentations and bi-weekly presentations were introduced for the first time in the SPICE model.

The SPICE model was therefore an effort to raise the bar of community health clerkship to the highest standard, this model was pilot tested in a rural community setting with the following objectives:

1) To pilot test the integration of evidence seeking with rural community health clerkship rotation by 4th year undergraduate medical students in a medical college.

2) To explore the category of evidence gathered by the students during the two month clerkship.

Table 1: Query box.

Answer (With references)	
Practical application	
Query Discipline: _____	
Category of the Query (*To be categorized by the supervisor's panel*)	
Preventive	
Curative	
Epidemiological (Association, Causation)	
Diagnostic	
Epidemiological (Incidence/Prevalence)	
Rehabilitative	

Methods

The students of 4th year medical college were involved in a new skill where we pilot tested the integration of evidence seeking with rural community health clerkship using our innovative SPICE model (Integrating Evidence Seeking with Primary care & Community Health), Figure 1. The clerkship was carried out in the spring of 2011.

The clerkship was supervised by the faculty of Community health sciences of the medical college in collaboration with primary health care physicians of the rural health centre. The clerkship was carried out in a rural community clinic in the vicinity of Islamabad, Pakistan. This rural community with a population of about 45000 has a good mix of children of all ages, women and men. The students were provided a format for asking questions related to the patients that were assigned to them (Table 1). The students were then expected to utilize the resources provided (Table 2) to them to answer those queries and write their findings in the Community health clerkship note book, specially developed by the faculty of community health sciences for this clerkship. The students were free to discuss their queries with their supervisors at any time during the clerkship. Each morning the primary care physicians assigned 2-3 patients per student. The students took history, performed physical examination and wrote the queries that arose in their mind related to their patients. The clinical findings were presented to and discussed by the student with the primary care physician.

The evidence based query, if any, was discussed later by the student with his Community health science supervisor. The supervisor then

Table 2: Learning resources**.**

US National Library of Medicine, National Institutes of Health *http://www.ncbi.nlm.nih.gov/pubmed/*
Cochrane Database *http://www.cochrane.org/*
Centre for evidence based medicine *http://www.cebm.net/*
Pakistani medical journals database *http://pakmedinet.com/*
Appraised Google portal *http://scholar.google.com/*
Epidemiology
Leon Gordis. Chapter 1: Introduction, Chapter 3 & 4: Measuring the occurrence of disease, Chapter 10: Case-control studies and other study designs (Pg 177-185, 195-198), Chapter 9: Cohort studies, Chapter 11: Estimating risk: is there an association? Chapter 7: Assessing the efficacy of therapeutic and preventive measures (Pg 131-140)
Biostatistics
JE Park. Chapter: Health information and basic medical statistics. Pg 642-651
Safe Motherhood
Ilyas Ansari. Chapter: Reproductive health, Page 375
MCH Indicators
JE Park. Preventive medicine in Obs. Page 412-424
EPI Schedules and EPI Programmes
Handouts
Pneumoconiosis
JE Park. Chapter: Occupational health. Pg 609-611
Accidents and Injuries
JE Park. Chapter: Epidemiology of chronic non-communicable diseases. Pg 323-328
Ilyas Ansari . Chapter: Injuries and accidents. Pg 139-144
Disaster Management
Ilyas Ansari. Chapter: Disaster management and control. Pg 145-149
JE Park. Chapter: Disaster management. Pg 600-605
Demography and Population Dynamics
JE Park. Chapter: Demography & Family planning. Pg 349-358
Ilyas Ansari. Chapter: Demography and population dynamics. Pg 91-102
Population based Surveys
JE Park. Chapter: Health information and basic medical statistics. Pg 638-641
HMIS
Ilyas Ansari. Chapter: Management Information system. Pg 103-107
International Health
JE Park. Chapter: Internal Health. Pg 704-710
Public Health and Health System In Pakistan
Ilyas Ansari. Chapter: Health and disease. Pg 2-4
Ilyas Ansari. Chapter: Rural and urban health. Pg 32-36
Primary Health Care
JE Park. Chapter: Healthcare of the community. Pg 685-689
Ilyas Ansari. Chapter:
Levels of Prevention and Modes of Intervention
JE Park. Chapter: Concept of health and disease. Pg 36-39
Screening
JE Park. Chapter: Screening foe disease. Pg 113-119
Malaria and Dengue Fever

JE Park. Chapter: Epidemiology of communicable diseases. Pg 198-201
Leprosy & HIV/AIDS
JE Park. Chapter: Epidemiology of communicable diseases. Pg 252, 271
Cancers
JE Park. Chapter: Epidemiology of chronic non-communicable diseases. Pg 302-310
School Health Services
JE Park. Preventive medicine in Obs. Page 425-430

helped the student refine the query. The students were given library time in the afternoon to look for answers to their queries from the resource list that was provided to the student. Daily lectures were given to the students in the afternoon to cover the topics as mentioned in the resource list. The students presented their findings in the bi-weekly morning meeting in the rural community clinic. The meeting was attended by the four supervisors, primary care physicians and other students involved in the clerkship.

At the end of the clerkship the students were supposed to submit their community clerkship note book to their supervisors for checking and giving feedback to the student. 20 students were involved in this first rotation to this rural community health clerkship. Each student was expected to ask and answer at least four questions during the two months clerkship. The clerkship note-book submitted by these 20 students was then reviewed by a panel of four supervisors of the community health sciences section. The student's questions were then assessed and placed in various pre-defined categories of questions. Each query was examined and classified in to a particular category by the panel of supervisor. Overall there was no disagreement among the supervisors in placing a particular query to a category.

Results

There were 105 queries made by the students during their 2 months community health clerkship with an average of about 5 queries per student (Table 3). The distribution of queries by discipline (Table 4), shows majority (70%) of the queries were related to General Medicine, followed by Gynecology/Obstetrics, Psychiatry and pediatrics followed by other disciplines. Surgery related queries accounted for only 2% of the queries. Classification of queries in to various categories, showed that prevention related queries were the highest (40%), followed by curative (37%) as shown in Table 5. It is interesting to note that Epidemiological queries (Association, causation, incidence/prevalence) together accounted for about 17% of the queries.

The type of queries varied and was reflective of the conditions prevalent in the rural set-up (Table 6). The conditions that were explored included predominantly Gastro-intestinal diseases, malnutrition in children, Dengue fever, Malaria, Tuberculosis, Hepatitis B & C, anaemia among women of child bearing age, smoking, Diabetes, COPD, respiratory tract infections and quality of life issues. Example of each category of query as made by the students has been presented in Table 6.

Discussion

The spectrum of disease that is seen in Primary health care setup predominantly pertains to primordial and primary prevention along with instituting secondary prevention strategies such as early diagnosis and prompt treatment of diseases. However, the exposure of the medical students in tertiary healthcare facilities in urban settings primarily focuses on advanced diseases with a greater focus on technology. This mainly encompasses advanced diagnostic techniques and expensive treatment options which contradicts the basic principles of early diagnosis and prompt treatment of diseases. Furthermore this leads to limited training in screening for diseases at the community level [5]. These graduates face extreme difficulty to practice medicine when they are placed in resource constrained environments, particularly at the union council, tehsil and district levels, as opposed to the larger cities. Moreover, they lack the communication skills, managerial skills, community problem-solving skills, health promotional and monitoring and evaluation skills that are so essentially required to practice in these areas [5]. In a technologically advanced country like the U.S, American Academy of Family Physicians (AAFP) urges for integration of primary care and public health [9]. It is essential when caring for their patients that family physicians consider the factors beyond the walls of their practice that influence their patients' health. The family physician must consider the social and physical environments in which their

Table 3: Overview of queries.

Total number of queries sought & answered	105
Number of queries sought per student	5

Table 4: Queries by discipline.

Discipline	Number	Percentage
General Medicine	74	70%
Gynecology/Obstetrics	11	10%
Psychiatry	7	7%
Pediatrics	6	6%
Community Medicine	3	3%
Surgery	2	2%
Forensic medicine	1	1%
Radiology	1	1%

Table 5: Classification of queries.

Categories	Number	Percentage
Preventive	42	40%
Curative	39	37%
Epidemiological (Association, Causation)	14	13%
Diagnostic	4	4%
Epidemiological (Incidence/Prevalence)	4	4%
Rehabilitative	2	2%

Table 6: Example of each category of query as made by the students.

Preventive	What is the knowledge and attitude of the community towards dengue and its prevention and control?
Curative	What is the current treatment of Dengue Fever.
Association	What is the association between smoking and incidence of respiratory viral infections like the flu?
	What are the risk factors of TB in adults, in a rural area?
Diagnostic	How can one differentiate between bruises of accidental injury and injury due to violence?
Incidence/Prevalence	What is the prevalence of Hepatitis B and C viruses in different age groups and gender in Pakistan?
Rehabilitative	In countries like Pakistan (a developing nation) the prevalence of chronic conditions (TB, COPD, Diabetes, etc) are on the rise and what effects due to these morbidities are brought about in the life of an individual, specifically on the quality of life?

patients live and work in order to effectively improve health outcomes [9]. The AAFP also urges all national, state, federal, and private sector institutions to partner with primary care and public health partners to ensure a more integrated delivery system is provided to improve population health [9].

The future medical doctors of Pakistan are not adequately trained to address primary health care issues and public health challenges of the country. This study therefore pilot tested the integration of evidence seeking with rural community health clerkship rotation by 4th year undergraduate medical students in a medical college and applying the latest evidence in taking care of the patients. This initiative was a step forwards towards provision of informed and improved quality of care to the rural population. Applying the latest evidence in taking care of the patients was the reason for providing the new resources to the students in this SPICE model.

Over a 100 evidenced based queries by 20 students within 8 weeks of rural clerkship was much above the clerkship requirements of a total of 80 queries by all the students. This in itself speaks about the keenness of the students and the technical support provided by the community health faculty in conducting this rural rotation. Similar efforts of integrating population and clinical medicine have been done in medical school curriculum in other parts of the world with success [10,11]. This integration makes more sense for Pakistan where 64% of the population lives in rural areas. From the point view of health equity resource allocation and service delivery should be as per needs of the population at hand [4]. This means that provision of evidence based comprehensive health care delivery, with emphasis on primary and secondary prevention is the need of the rural population of Pakistan. As such medical graduates of the country should be trained in line with this requirement. They will then be able to deal effectively with the common community health problems giving due regard to social, environmental and local context.

Majority of the queries were related to the discipline of Medicine, which was a reflection of the frequency with which these conditions presented at the rural health centre. These conditions included; Tuberculosis, Malaria, and Dengue Fever.

It is worthwhile to note that majority of the queries were preventive in nature, followed by curative. It highlights the fact that the lecture sessions on the concepts of community health sciences including levels of prevention and concepts in epidemiology were well imbibed by the students. Many queries on pure Epidemiology concepts of Association/causation and incidence/prevalence were also reflective of the student's curiosity in making community diagnosis of the health problems and exploring modifiable and non-modifiable risk factors of disease association and causation.

The SPICE model (Integrating Evidence Seeking with Primary care & Community Health) as depicted in Figure 1, has been tested in this pilot study among 4th year undergraduate medical students. A conceptual frame-work with a proposed system of adopting this tested model has been presented in Figure 1. It also provides a way forward with pointers to call for actions in the areas of Strategic leadership by Federal and provincial ministries of health, medical and dental council and federal and provincial public health organizations. The mode also provides a way forward for the medical colleges and primary health care practices in the rural areas of the country.

Limitations of the Study

The study accepts the limitation that there is no quantitative data to suggest any improvement in objective or subjective skills of the medical students engaged in the clerkship.

Qualitatively we acknowledge that the students liked the rural clerkship but we do not have data to support that students performed better on written exams, whether the students felt more confident or the faculty evaluations changed significantly after the introduction of the model.

Conclusion

Integration of evidence seeking with rural community health clerkship rotation by 4th year undergraduate medical students in a medical college was successfully pilot tested, developing the SPICE model, and found to be objectively designed, practically feasible, learner centered and liked by the students and the faculty members involved in the study. The students explored all aspects of care but the category of 'prevention' received the highest percentage of queries (40%) by the students followed by 'curative' queries (37%). The pilot test results are highly supportive of adopting this model in the training curriculum of undergraduate medical education throughout the country.

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