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Dermatology in the Tropics; a Trend Analysis of the Effects of Inadequate Undergraduate Dermatology Training on the Frequency of Dermatology Cases, a Study Based in 5 Ghanaian Public Facilities

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Introduction

Dermatology is a branch of medicine that dates back to the pre Historic Egyptian Papyrus and the Hippocratic writings to the first treatises.

The skin being the largest organ of the body, it would be assumed that a lot of emphasis would be placed on the diagnosis and management of dermatology cases in our undergraduate healthcare training institutions but that is not the case. Dermatology has since been underrated as compared to the other branches of medicine despite accounting for 15-30% of hospital visits worldwide.

In Ghana undergraduate medical training places little to no emphasis on dermatology in the course structure of their students. This causes a significant inefficiency/inadequacy in diagnosing and managing dermatological cases and this has a direct effect on the management efficacy of these healthcare providers. These students will go on to become Medical Officers/Physician Assistants with little to no in-depth knowledge in dermatological cases.

This study seeks to identify the gaps in training of primary care physicians in the area of dermatology and the consequent effect it has on management of dermatological cases and hospital visits.

Background

Skin infections are a common cause of hospital visits in Ghana however clinical training of Primary care physicians in Ghana is deficient in the area of dermatology causing a challenge in the effective management of Dermatological cases in clinical practice resulting in a reduction in Dermatological visits to the Primary Care Physicians. The study was therefore aimed at;

I. Assessing the frequency of Dermatological cases in some selected health facilities.
II. Drawing a correspondence between the low turn-out of dermatology cases at the OPD in Primary Healthcare Facilities to the lack of adequate undergraduate training of primary care physicians in Dermatology.
III. Analyzing the course structure of the undergraduate training of Medical Officers and Physician Assistants in the area of Dermatology in Ghana.

A study by Adawiyah Jamil et al in 2016 on the topic "Identifying the Core Content of Dermatology
Module for Malaysian Medical Undergraduate Curriculum Using a Modified Delphi Method" made the following assertions [1].
"Dermatology is considered a medical subspecialty and taught as a component of Internal Medicine in undergraduate curricula. Traditionally, dermatology has been deemed less important than, for instance, cardiology; therefore limited time is allocated for teaching this module. Dermatology is formally taught in only a few local universities, depending on the content of the internal medicine programme [2].

Among those institutions, the module content varies from one academic programme to another.
In the United States, 33 medical schools do not have any undergraduate dermatology programs,
while more than half dedicate less than 10 hours to a dermatology module.

Despite being perceived as a minor subject, several studies have highlighted the importance of dermatology knowledge, particularly in general practice where dermatological diseases are common.

According to Kerr et al., 3% to 20% of primary care consultations in a two week period were due to skin diseases, of which 22.5% were eczema and 20.3% were infections" [3].

Evident from the research conducted in 2016 by A Jamil et al Dermatology education and training is given far less priority in the medical training of doctors and Physician assistants [1].
As many as 33 out of the 155 medical schools in the United States had no undergraduate dermatology program this represents 21.29% of medical schools in the United States, what this tells us is that for every 10 medical schools you are likely to have the entire student population of 2 schools not undergoing any structured dermatological training upon graduation as medical doctors. This gap will definitely impact upon identifying and diagnosing dermatological cases.

A lot of patients present to the primary care physician with their illnesses of which dermatological cases are no exceptions, when these primary care physicians have not received adequate training

to diagnose and effectively manage these cases, there is always going to be that inadequacy in treatment which directly affect the client in pursuit of treatment for their skin disease/infections.

A study conducted by A Yakuub et al on Dermatological content of U.K. undergraduate curricula in 2015 presented to the British Association of Dermatologists stated that [2];
"Dermatology is only mandatory in 75% of medical schools. In other words, some students at a quarter of medical schools graduate having had no clinical attachment in dermatology. In some cases, this was site dependent, though one medical school had to stop teaching dermatology due to the large number of students. Additionally, extra opportunities for dermatology exposure had to be suspended in one medical school due to a shortage of staff, though almost all schools were able to offer this to at least a small number of students".

The above situation is not different from the earlier inference drawn from the study by A Jamil et al in the US where about 21.29% of students were likely to graduate without having adequate training in dermatology, 25% of students in this case are likely to graduate from their study in medical school without having had no attachment in clinical dermatology [2]. This impacts directly on their competency in the area of dermatology in their practice. It is widely known in medical practice that a doctor is as good as his last diagnosis and to make a very good diagnosis stems from a very good clinical knowledge and hands on practical experience which from the above study is quite frankly lacking in about 25% of medical students produced in the UK. This further impacts on the patient and hospital visits.

A study conducted by B Rosenbaum et al at the Korle-Bu teaching hospital in Accra Ghana on the topic "Dermatology in Ghana: a retrospective review of skin disease at the Korle Bu Teaching Hospital
Dermatology Clinic" in 2014 [3]. They made the conclusion below that;
"Seventy-one percent of charts contained the referral diagnosis made by the patient's primary
care provider. The diagnosis made by dermatologists differed from the original referral diagnosis
in 65.8% of these patients."

This clearly shows the diagnostic inadequacy of primary care physicians with respect to dermatology.
Dermatology in Ghana is a very crucial area with very few clinical dermatology specialists who are found in "big" facilities. The first point of call for these dermatology cases are the primary care physicians. It is these same physicians who the study above found to be diagnosing inadequately or insufficiently in about 65.8% of patients that come to them.

This further buttresses the fact that the current undergraduate training in dermatology is inadequate therefore has resulted in a direct effect of inadequate or missed diagnosis of patients with respect to dermatology. This ultimately results in fewer dermatology visits to these primary health centers with even the simplest of dermatological cases.

Study Design
Cross-sectional study design was adopted with data collection covering patients' records from the five Health facilities between April 2021 and September 2021. This design ensured we collected the data at one point in time to enable our description of the pattern of prevalence of skin infections/disease. Our objective was to obtain a structured set of data that enabled systematic comparisons between the incidence over the period. We needed data on dermatological cases to show trends of dermatological cases by months using the same variables. As our interest was to compare the cases/incidence of dermatological cases across the 5 facilities, a cross-sectional design was considered the most appropriate.

Study Setting
The study was conducted in the Adenta Municipality, which is one of the fastest growing Municipalities in Greater Accra. The five facilities under study were;

1. St. John of God Hospital located in the Koose subdistrict of the Adenta Municipality
2. Ogbojo Polyclinic located in the Nii-Ashale subdistrict of the Adenta Municipality.
3. Frafraha Health Center located in the Gbentaanaa subdistrict of the Adenta Municipality
4. Nii- Ashale Health Center located in the Nii Ashaley subdistrict of the Adenta Municipality
5. Adjiringanor Health Center located in the Sutsurunaa subdistrict of the Adenta Municipality.

Study Population
The study population included all persons who reported to the Health facilities under study to be treated for any skin disease/ infection between April 2021 and September 2021. The sampling frame for the study was, therefore, the number of dermatological cases that had been recorded during the period.

Exclusion and Inclusion Criteria
The study included anyone who presented with any skin disease/ infection to any of the Health facilities under study from April 2021 to September 2021. People who never visited the health facilities during the period or visited but were not treated for dermatological cases were excluded.

Sampling Method
Purposive sampling was used to target and focus on only dermatological cases for the period of the study. The sample size depended on the number of cases recorded in the DHIMS 2 database for the facilities under review. This was to ensure the representatives of the study.

Data Collection Procedure
Data used for the study were based on the records of the facilities under study. Access to the data was facilitated by Health Information & Statistics Unit. The Records Officer extracted data on all dermatological cases during the designated period from the DHIMS 2 database. The extracted data were made available in an electronic format. All dermatological cases from April 2021 to September 2021 were extracted and used for the study.

Data Analysis, Results and Discussions
Tab 1.0: Table showing the Total OPD cases in selected health facilities in Adentan Municipality cases from May 2021 to September 2021.

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	TOTAL OPD CASES IN HEALTH FACILITIES				
MONTH	**ST. JOHN OF GOD CLINIC**	**OGBOJO POLY-CLINIC**	**ADJIRINGANOR H/C**	**NII ASHALE H/C**	**FRAFRAHA H/C**
MAY	1689	422	146	210	152
JUNE	2146	661	212	379	249
JULY	2409	720	190	195	152
AUGUST	2149	592	190	134	254
SEPTEMBER	2076	501	223	315	228
TOTAL	10469	2896	961	1233	1035

Table 2.0: Table showing the Dermatology cases in selected health facilities in Adentan Municipality cases from May 2021 to September 2021

	TOTAL OPD CASES IN HEALTH FACILITIES				
MONTH	**ST. JOHN OF GOD CLINIC**	**OGBOJO POLY-CLINIC**	**ADJIRINGANOR H/C**	**NII ASHALE H/C**	**FRAFRAHA H/C**
MAY	88	24	7	11	7
JUNE	90	10	7	48	6
JULY	100	16	8	8	5
AUGUST	81	26	11	5	8
SEPTEMBER	122	18	4	15	9
TOTAL	481	94	37	87	35

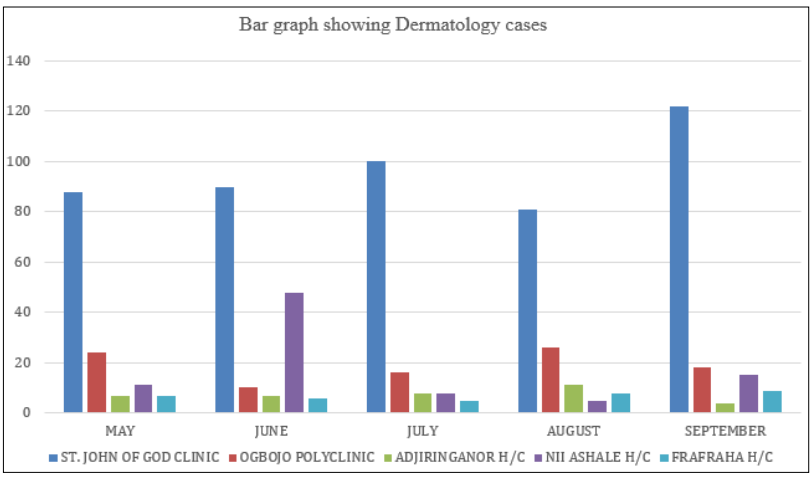

Figure 1.0: Bar presentation of Dermatology cases in selected health facilities in Adentan Municipality

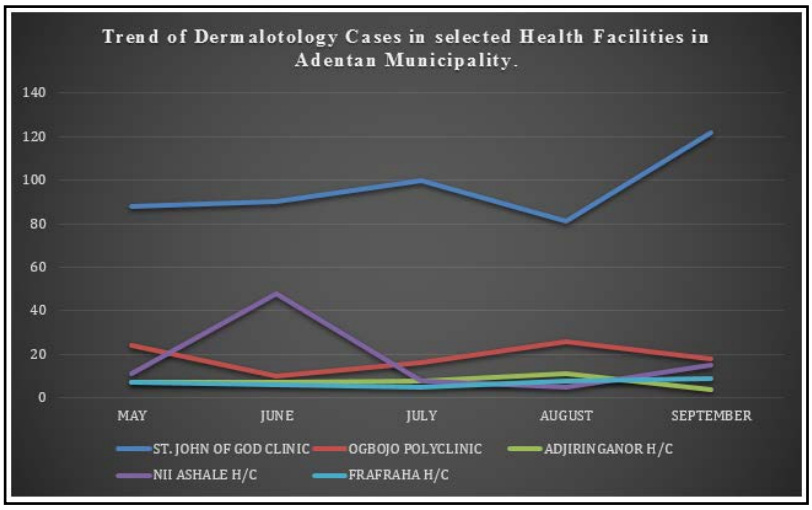

Figure 2.0: Trend/Line presentation of Dermatology cases in selected health facilities in Adentan Municipality

Tab 1.0 shows the total number of Outpatient Department (OPD) cases that was seen in the selected Health facilities in the Adentan Municipality.

From Tab. 2.0, the total number of dermatology cases seen at OPD in the period of the study were 481 for St. John of God Clinic, 94 for Ogbojo Polyclinic, 37 for Adjiringanor Health Centre, 87 for Nii Ashale Health Centre and 35 for Frafraha Health Centre. Out of the total number of OPD cases for the selected Health facilities in the period of the study, the dermatology cases form 4.6%, 3.3%, 4%, 7% and 3.4% respectively.

Also fig. 1.0 shows the pictorial presentation of how dermatology cases are has constant falls in all the facilities especially with Adjiringanor Health Centre which had a constant fall from May to September.

From Fig. 2.0, Frafraha Health Centre almost had a flat line from the beginning (May) to the end (September) of the study which shows no rise or fall of number of cases seen. Nii Ashale Health Centre had a heavy rise in June but had a downward slope thereafter.

To sum up, all indications from the tables and graphs show how dermatology cases are experiencing a low turnout in the facilities under study.

A comparative analysis was then done on the curricula of some selected medical training institutions and the following findings were made.

Table 3.0: 6 year course structure of Medical school A

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
INTRODUCTION TO BASIC SCIENCES	MEDICAL SOCIOLOGY	CHEMICAL PATHOLOGY	JUNIOR CLERKSHIP IN COMMUNITY HEALTH	CHILD HEALTH	CLINICAL PSYCHIATRY
	HISTORY OF WESTERN MEDICINE	HAEMATOLOGY	MEDICAL PSYCHOLOGY	OBSTETRICS & GYNECOLOGY	SENIOR CLERKSHIP IN SURGERY
	PSYCHOLOGY	MICROBIOLOGY	INTRODUCTION TO NURSING SKILLS	SPECIALTIES	SENIOR CLERKSHIP IN COMMUNITY HEALTH
	ANATOMY	PATHOLOGY	INTRODUCTION TO CLINICAL SKILLS		SPECIALTIES (ANESTHESIA/UROLOGY/ORTHOPEDICS AND RADIOLOGY
	MEDICAL BIOCHEMISTRY	PHARMACOLOGY	COORDINATED COURSE 1(MEDICINE & SURGERY, COMMUNITY HEALTH AND APPLIED PATHOLOGY AND INPUTS FROM OTHER CLINICAL DEPARTMENTS		
	PHYSIOLOGY		MEDICAL ETHICS		
			COORDINATED COURSE 2 (MEDICINE & SURGERY, COMMUNITY HEALTH AND APPLIED PATHOLOGY		
			TRAUMA & ORTHOPEDICS		

This course structure clearly shows a lack of dedicated hours for dermatological lectures in the whole 6yr medical training program in this particular school. This means that a student from this particular school might not receive any structured lecture in dermatology upon graduation.

Table 3.1: 4 year course structure for school of Physician Assistant studies A

YEAR 1	YEAR 2	YEAR 3	YEAR 4
BIOCHEMISTRY 1&2	HISTORY TAKING AND PHYSICAL EXAMINATIONS 1&2	PHYSICIAN ASSISTANT PRACTICAL	CLERKSHIP 1 (INTERNAL MEDICINE)
CLINICAL ANATOMY 1&2	HUMAN ECOLOGY	FAMILY HEALTH 1	CLERKSHIP 2 (PEDIATRICS)
HUMAN PHYSIOLOGY 1 & 2	PHARMACOLOGY 1&2	BASIC SURGICAL SKILLS	CLERKSHIP 3
BASIC NURSING	HUMAN PHYSIOLOGY 3	INTERNAL MEDICINE 2 &3	CLERKSHIP 4
LABORATORY TECHNIQUES AND SKILLS	MEDICAL PSYCHOLOGY AND PSYCHIATRY	BASIC NUTRITION	CLERKSHIP 5
HISTORY OF MEDICINE, LAW AND ETHICS	EPIDEMIOLOGY 1&2	PUBLIC HEALTH	PRECEPTORSHIP
MEDICAL SOCIOLOGY	INTERNAL MEDICINE	HISTORY TAKING AND PHYSICAL EXAMINATIONS 3	PROJECT WORK/ LONG ESSAY
INTRODUCTION TO AFRICAN CULTURE AND NORMS	CLINICAL MICROBIOLOGY	HEALTH SERVICE MANAGEMENT AND ADMINISTRATION 1&2	ENTREPRENEURSHIP
INTRODUCTION TO AFRICAN FAMILY	COMMUNITY RELATIONS	HEALTH PROMOTION AND SOCIAL MARKETING	
COMMUNICATIVE SKILLS 1&2	BIOSTATISTICS	PATHOLOGY 2	
INFORMATION RETRIEVAL	PHYSICIAN ASSISTANT PRACTICAL 2	FAMILY HEALTH 2	
		TRADITIONAL MEDICINE	
		PHYSICIAN ASSISTANT PRACTICAL 3	
		RESEARCH METHODOLOGY	

The above table shows the course structure of a Physician Assistant training school. It is clearly evident that the entire 4 year training of the Physician Assistant does not have any dedicated/designated lecture hour for tackling/treating dermatology as a course.

Table 3.2: Course Structure For Medical School B

PRE-CLINICAL YEARS 1-3	CLINICAL YEAR 1	CLINICAL YEAR 2	CLINICAL YEAR 3
INTRODUCTION TO BASIC SCIENCES	JUNIOR CLERKSHIP IN COMMUNITY HEALTH	JUNIOR CLERKFSHIP IN OBS & GYN	CLINICAL PSYCHIATRY
INTRODUCTION TO BASIC SCIENCES	MEDICAL PSYCHOLOGY	JUNIOR CLERKSHIP IN CHILD HEALTH	ANAESTHESIA
INTRODUCTION TO BASIC SCIENCES	INTRODUCTION TO NURSING SKILLS	JUNIOR CLERKSHIP IN CLINICAL SPECIALTIES 1 (PSYCHIATRY, DERMATOLOGY, OPHTHALMOLOGY, ENT & FORENSIC MEDICINE)	SENIOR CLERKSHIP IN MEDICINE AND THERAPEUTICS
	INTRODUCTION TO CLINICAL SKILLS	SENIOR CLERKSHIP IN OBS &GYN	SENIOR CLERKSHIP IN SURGERY
	COORDINATED COURSE 1 (MEDICINE & SURGERY, COMMUNITY HEALTH APPLIED PATHOLOGY	SENIOR CLERKSHIP IN CHILD HEALTH	SENIOR CLERKSHIP IN COMMUNITY HEALTH
	MEDICAL ETHICS		SPECIALTIES 2 (ANESTHESIA, UROLOGY AND ORTHOPEDICS, RADIOLOGY)

Tab 3.2 shows the course structure for another Medical school in Ghana. This structure features a 8 week shared junior clerkship clinical course in dermatology. This means that dermatology lectures feature in an 8 week module together with other specialties like Psychiatry, Dermatology, Ophthalmology, ENT and Forensic Medicine.

Discussions

Dermatological training in undergraduate medical institutions is close to non-existent in Ghana. These same students go on to become practitioners in most primary care facilities without the services/luxury of a specialist dermatologist. This means that for every dermatological case that presents they are the first point of call in identifying, diagnosing and managing these conditions.

Tab 1.0 shows the total number of overall OPD cases seen in these facilities, Tab 2.0 shows the number of dermatological cases that

were recorded in the 5 months that the facilities were under study.

The results from tab 2.0 shows clearly that dermatological cases/ visits to these primary care facilities were less than 10% of the overall patient attendance. According to a study conducted by C. Flohr et al published in February 2021 on the topic "Putting the burden of skin disease on the global map" stated that "skin diseases are the fourth most common cause of all human disease affecting almost one-third of the world's population". This statement is true for all health systems worldwide, however the trend noted in the data collected and analyzed tell a different story [4]. Is it that the incidence of skin diseases decreased in the Adenta municipality despite having all the factors that contribute to skin infections still at play?

The total number of patients seen at the OPD in all 5 facilities were 16,594 with dermatology cases being 734 representing 4.423% of total OPD attendance. These numbers suggest that for some reason the Adenta Municipality which had a projected population of 98,682 by the year 2020 according to the Ghana Statistical Service had only 734 cases of skin diseases within the 5 months of study of these facilities. The low turnout of dermatological cases in these facilities can be attributed to a number of reasons.

The first reason that could account for the low turnout in dermatological cases as evidenced above would be inadequate record keeping in that Data collection and records officers would not be keeping up to date information on the number of dermatology cases that are presented to the facility, the introduction of the District Health Information management systems (DHIMS 2) by the Ghana Health Service however requires that all health information officers and data officers in the various facilities to update the system with all attendants seen every month, this means that inadequate data collection might not be a strong factor contributing to the low turnout as seen.

The other reason that could account for the low turnout in dermatological cases as evidenced above would be missed/ inadequate diagnosis. This is a probable and strong contender for the reason for the low turnout for dermatological cases in the Adentan Municipality. According to a study done by B. Roosenbaum et al in Accra in 2014 stated that "The diagnosis made by dermatologists differed from the original referral diagnosis in 65.8% of these patients" [3]. The above shows clearly a lack of diagnostic adequacy by primary care physicians in the area of dermatology. This finding is also confirmed by the various course structures that were reviewed and compared in this study. Out of the three course structures that were reviewed only 1 (fig 3.2) contained a dedicated module for dermatology, even though a 8 weeks shared module is not an ideal case for dermatology, it is the most we have seen so far in the Ghanaian medical training system. The primary care physicians produced by these medical training institutions are the very first point of call for the patient with dermatological /skin diseases and inadequate diagnosis and management will cause the patient/client to seek specialist care for the simplest of dermatological illnesses thereby causing a fall in the turnout of dermatological illnesses in the municipality [5-9].

Conclusions

Undergraduate medical training in Ghana places little to no emphasis on dermatology in the training of medical practitioners causing a resultant inadequacy in diagnosing and managing dermatological cases in practice thereby causing a low turnout in dermatological cases in the selected facilities. This study can serve as a basis for introducing a dermatology specialty for primary care physicians to bridge the gap of inadequate diagnosis and management of dermatological cases.

Recommendations

The Ministry of health of Ghana should collaborate with the relevant agencies to roll out Specialist programmes or certificate courses in dermatology to help bridge the knowledge gap.

The Deans and rectors of medical training institutions must incorporate dermatology in the course structure of these undergraduate students to help build competence in the field of dermatology during practice.

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