**ORIGINAL ARTICLE**

# Knowledge, attitude, perception and practices of primary care physicians regarding common dermatological diseases: A cross-sectional study

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## ABSTRACT

**INTRODUCTION** Dermatologic diseases are one of the common reasons for consult in primary care. Primary care physicians such as the doctors to the barrios (DTTBs) assigned in geographically isolated areas play a critical role in providing primary skin health services since they are the first, and sometimes, only doctors patients rely on for consult. In managing skin diseases, adequate knowledge and skills are needed to arrive at a correct diagnosis, and a physician's proper initial treatment and timely referral to dermatologists will lead to less affectation on quality of life. Identifying what is lacking in skin health services and referral system would aid dermatologists in finding out how to bridge the gap in knowledge and access to our specialized skin health care.

**OBJECTIVES** The study aimed to determine the knowledge, attitudes, practices, and perceptions of primary care physicians in the Philippines regarding common dermatologic conditions.

**METHODS** This is a cross-sectional study that utilized a self-administered questionnaire to collect data from rural government primary care physicians (doctors to the barrios). At the end of the study, the proponents collated the data and data analysis was done using STATA 13.1 guided by a statistician.

**RESULTS** A total of 118 DTTBs were included in the study. The mean age of the physicians is 28 years old. One-half of the physicians were assigned to low-income class municipalities; 26.85% and 25% are from 4th class and 5th class municipalities respectively. Factors such as age, sex and clinical experience were not associated with level of knowledge of the respondents. Majority or 55% of the primary care physicians were classified as having insufficient knowledge on common skin diseases. The respondents have an average of 250 consultations per week and 6% of these are dermatologic diseases. The most common skin diseases they encountered were impetigo (46.61%), scabies (46.61%), contact dermatitis (43.22%), fungal infection (25.42%) and cellulitis (20.34%). The most prescribed and available medications for skin diseases are oral and systemic antibiotics. Only 42.37% of the physicians are able to refer to dermatologists through various online communication platforms while the rest refer through phone calls or advise their patients to seek dermatologic consult. 25% of the respondents have direct access to dermatologists. DTTBs also have recognized the importance of having adequate knowledge on skin diseases and majority are very interested in learning more about these conditions. The top 3 barriers to the proper management of skin diseases were lack of training, lack of experience, and lack of medications. Most of the respondents have rated themselves as average to bad in their perceived competency in diagnosing and managing different common skin diseases.

**CONCLUSION** The study showed that majority of the respondents had insufficient knowledge on the diagnosis and management of common dermatological diseases but had a strong interest to learn more. A significant number of the respondents do not always refer to dermatologists and have poor access to specialty care. Overall, our findings suggest that there are indeed barriers to delivery of skin-related health services that should be addressed.

**KEYWORDS** primary care physicians, common dermatologic diseases

## INTRODUCTION

The Global Burden of Diseases Study 2010 stated that skin diseases are one of the most common human illnesses. At the global level, skin conditions were the fourth leading cause of nonfatal disease burden. Collectively, skin conditions ranged from the 2nd to 11th leading cause of years lived with disability at the country level.[1] This emphasizes the importance of giving more attention to skin diseases at the community level, especially where there is limited access to dermatologists and where primary physicians are solely being relied on.

Primary care physicians play a critical role in the health care system of the Philippines. They are the first and sometimes the only doctors patients can consult especially in geographically isolated areas where specialized health care is less accessible. The Department of Health (DOH) recognized the importance of the presence of physicians in rural areas and the lack thereof, hence they created the Doctors to the Barrios program where hundreds of doctors were deployed to disadvantaged and hard to reach areas of the Philippines to work on public health policies and to provide primary care. These doctors

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manage patients daily on an outpatient basis and they provide basic health services. They see a wide array of diseases including dermatologic conditions. It is vital that they recognize the importance of being able to diagnose and manage skin diseases, and to know when to refer to dermatologists especially those cases with high impact such as skin cancer, leprosy, and psoriasis.

Referral of patients from primary care to specialized care accounts for a considerable part of primary care activity, since it is key to reducing costs and increasing the safety, efficacy, and effectiveness of health care.[2] Dermatologists, on the other hand, should lead in initiating efforts to help effect change towards improving health care delivery for patients with skin diseases.

This study aimed to determine the knowledge, attitudes, and self-perception of competency of our primary care physicians in rural areas of our country in the diagnosis and management of common skin disease and the frequency of skin diseases. This study also determined the status of the service delivery network in terms of dermatologic diseases and to determine whether health units have the appropriate protocols and resources to facilitate referrals to dermatologists when needed. This will help identify what is lacking in services and health care delivery in terms of skin diseases and enlighten dermatologists on how they can work with primary care physicians so that specialized care for skin diseases can be extended and made more accessible to the people who need it the most.

### DEFINITION OF TERMS:
1. Competence: The ability of a physician to provide correct, safe, and reliable diagnosis and management for his/her patients consistently.
2. High-impact skin diseases: Diseases that significantly affect quality of life of patients, especially when there is a delay in diagnosis or inadequate treatment.

### RESEARCH OBJECTIVES
The general objective of this study was to determine the knowledge, attitudes, practices, and perceptions of primary care physicians in the Philippines, regarding dermatologic conditions. Specifically: 1) to determine the frequency of dermatologic problems/consultations in the rural areas in the country; 2) to assess the basic knowledge of rural government primary care physicians regarding dermatologic conditions; 3) to determine the common attitudes of rural government primary care physicians regarding dermatologic conditions; 4) to investigate the common practices of rural government primary care physicians regarding dermatologic conditions; and 5) to determine the self-perception of competency of rural government primary care physicians regarding diagnosis and management of dermatologic conditions.

## METHODOLOGY
### STUDY DESIGN
This is a cross-sectional study conducted on rural government primary care physicians, specifically the DTTBs of the DOH, using a self-administered questionnaire.

The researcher formulated the questionnaires, it was based on the results of previous similar studies conducted by Al Zahrani, M. A. et al. (2017) and Bahaullah, S. O. et al. (2015).[3,4] The topics and questions were selected and framed based on the desired outcome measures of the researcher. The questions assessing the knowledge of the respondents were based on the dermatology textbooks Fitzpatrick's Dermatology in General Medicine (8th Ed), Andrew's Diseases of the Skin: Clinical Dermatology (12th Ed) and Dermatology by Bologna (2012) with the guidance of the researcher's advisers.[5,6,7] For pilot testing, the questionnaires were distributed to general physicians and DTTBs who have already graduated from the program. Kappa agreement analysis and Cronbach's alpha analysis was used to determine the reliability and consistency of the data collection tool.

### SETTING
This study was done at institutions where primary care physicians or DTTBs had their continuing medical education (CME) classes. The researcher coordinated with the DTTBs and concerned authorities to obtain the required data. The parts of the questionnaire containing questions on general data, attitudes, practices, and perceptions were emailed beforehand to the doctors for more convenient data collection from their own municipalities. The questionnaire containing questions for the knowledge part was administered to the physicians during their CME between October to November 2020. The respondents' identities were kept anonymous.

### SUBJECT SELECTION
Purposive sampling was done in this study. The respondents were primary care physicians under the DTTB program of the DOH. There are currently 298 active doctors to the barrios serving in various municipalities all over the Philippines.

### INCLUSION CRITERIA
1. Physicians enrolled to the Doctors to the Barrios program of the Department of Health, both municipal health officers and rural health physicians who have served in their municipalities for at least six (6) months.

### EXCLUSION CRITERIA
1. Physicians who have already undergone specialty training in dermatology.
2. Physicians who were absent at the day of face-to-face

data collection using the self-administered question-naire.

## OUTCOME MEASURES

As per the objectives of this study, the outcome measures are as follows:

1. Sociodemographic profile
   a. Age
   b. Sex
   c. Highest educational level (MBBS, specialized diploma/specialty, masters)
   d. Clinical experience (in years)
   e. Assigned municipality
   f. Total population served
   g. Average number of patients seen per day
   h. Average number of dermatologic cases seen per day
   i. Presence or absence of educational activities on dermatologic diseases in your area (yes/no)
   j. Presence or absence of data on dermatologic diseases (yes/no)
   k. Presence or absence of guidelines/protocol for management of dermatologic diseases
   l. Access to dermatologists
2. Top 5 most common dermatologic skin diseases seen in their municipality
3. Top 4 most common treatments given for dermatologic diseases
4. Knowledge, attitudes, practices, and perceptions (KAPP)
   a. Knowledge scores (excellent (>85% correct answers), very good (75-85% correc answers), good (60-75% correct answers), insufficient (<60% correct answers))
   b. Attitudes (toward referral to dermatologists, intention to learn, barriers and difficulties in managing skin diseases)
   c. Practices (regarding the management of common dermatological problems)
   d. Self-perception on competency on their ability to diagnose skin diseases (very good, good, average, bad, very bad)
   e. Self-perception on competency on their ability to treat skin diseases (very good, good, average, bad, very bad)

## STATISTICAL ANALYSIS

At the end of the study, the study proponents collated the data and data analysis was done using appropriate statistical tools, guided by a statistician. Descriptive statistics was used to summarize the demographic and clinical characteristics of the respondents. Frequency and proportion were used for categor-ical variables and mean and standard deviation for normally distributed continuous variables. Independent sample T-test and Fisher's exact/Chi-square test were used to determine the difference of mean and frequency, respectively, between primary care physician with and without sufficient knowledge. Odds ratio and corresponding 95% confidence intervals from binary logistic regression was computed to determine the association of demographic profile to insufficient knowledge of the primary care physicians. All statistical tests were two-tailed tests. Missing variables were neither replaced nor estimated. Null hypotheses were rejected at 0.05 α-level of significance. STATA 13.1 was used for data analysis. Conclusions and recommendations were then made after discussions among all the authors of the study.

## ETHICAL CONSIDERATIONS

The proposal was submitted to the East Avenue Medical Center Institutional Ethics Review Board (EAMC IERB) for evaluation and approval, after the evaluation and approval of the EAMC Department of Dermatology. The privacy of the results of the study was the tacit responsibility of the authors of the study.

## BIAS

To minimize bias, pilot testing and tests for reliability and consistency were done to ensure comprehensiveness and clarity of the questionnaire. An adequate amount of representative sample was also achieved to provide unbiased estimates of attitudes and practices in the target population.

## SAMPLE SIZE

The formula for sample size computation was taken from the Oxford Handbook of Medical Statistics by Peacock.[8] A minimum of 82 rural government primary care physicians were required for this study on the assumption that 30.48% of physicians have sufficient knowledge of common dermatological problems from the study of Al Zahrani et.al,[3] with 5% level of significance and 10% desired half width of the confidence interval.

$$n \geq \frac{Z^2_\alpha \times 4 \times P \times (1-P)}{d^2}$$

$$n \geq \frac{1.96^2 \times 4 \times 0.3048 \times (1-0.3048)}{0.20^2}$$

$$n \geq 81.40 \approx 82$$

## RESULTS

A total of 142 doctors to the barrios (DTTBs) were present at the data collection and were screened for eligibility. Out of the 142, 118 DTTBs were included in the study. The exclusion of the other physicians from the study was due to failure to meet inclusion criteria and absence at the time of data collection. 118 DTTBs were able to submit the questionnaires, however, several of them had missing data due to incompletely answered questionnaires (see Figure 1). Pairwise deletion was done in the treatment of the
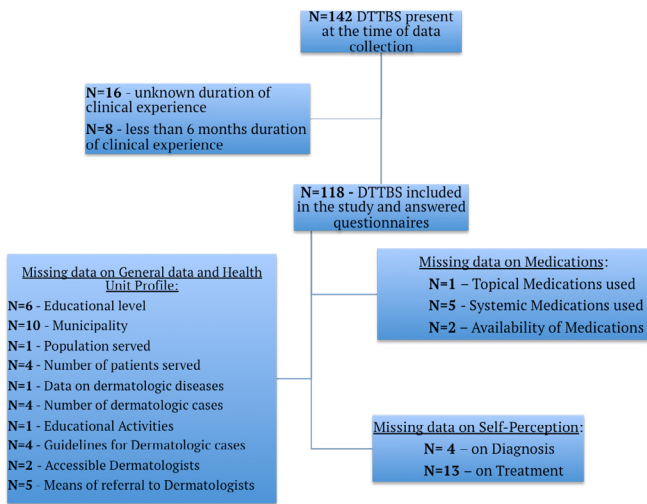
**Figure 1.** Number of respondents and number of respondents with missing data for each variable.

**Table 1.** Demographic profile of the Primary Care Physicians and Knowledge on Common Skin Diseases

| | Total (n=118) | Insufficient knowledge (n=65, 55%) | Sufficient knowledge (n=53, 45%) | P-value | Odds ratio (95% CI) |
|---|---|---|---|---|---|
| | | Frequency (%); Mean + SD | | | |
| Age (years) | 28.54 + 3.12 | 28.83 + 3.67 | 28.16 + 2.20 | 0.258 | 1.09 (0.94–1.26) |
| Sex | | | | 1.000 | |
| Male | 54 (46.55) | 30 (46.88) | 24 (46.15) | | (reference) |
| Female | 62 (53.45) | 34 (53.13) | 28 (53.85) | | 0.97 (0.47–2.03) |
| Highest educational attainment | | | | | |
| MD | 65 (55.08) | 32 (49.23) | 33 (62.26) | 0.194 | 0.59 (0.28–1.23) |
| Masters/ Doctorate | 71 (60.17) | 38 (58.46) | 33 (62.26) | 0.709 | 0.85 (0.41–1.79) |
| Clinical experience before the DTTB Program (in years) | | | | 0.647 | |
| <1 | 73 (65.77) | 44 (69.84) | 29 (60.42) | | (reference) |
| 1 | 24 (21.62) | 11 (17.46) | 13 (27.08) | | 0.56 (0.22–1.41) |
| 2 | 12 (10.81) | 7 (11.11) | 5 (10.42) | | 0.92 (0.27–3.19) |
| 3 | 2 (1.80) | 1 (1.59) | 1 (2.08) | | 0.66 (0.04–10.9) |
| Clinical experience in the DTTB Program (in years) | | | | 0.341 | |
| <1 | 63 (53.39) | 32 (49.23) | 31 (58.49) | | (reference) |
| 1 | 11 (9.32) | 8 (12.31) | 3 (5.66) | | 2.58 (0.63–10.6) |
| 2 | 43 (36.44) | 25 (38.46) | 18 (33.96) | | 1.35 (0.62–2.94) |
| 3 | 1 (0.85) | 0 | 1 (1.89) | | - |

missing data. The mean age of the physicians is 28 years old and there were more females than males who were able to participate. Majority (65.77%) of the doctors had less than one (1) year of clinical experience in their municipality as DTTBs. Based on

data analysis, there was no association between knowledge on common skin diseases and the demographic profile of the respondents including age, sex, educational attainment, or clinical experience (Table 1).

According to Executive Order No. 249, municipalities of the Philippines have been divided into six (6) main classes according to the average annual income that they realized during the last four (4) calendar years. Our data show that the higher the class of the municipalities, the higher the income and the more population is being served, which translate to a greater number of patients and dermatologic cases seen per week (Table 2). The average number of consults that these doctors see per week is 250 and the average number of consults due to skin diseases is 15 per week. This means that 6% of the average number of consultations per week is regarding skin diseases.

The doctors to the barrios included in the study were each assigned to different municipalities all over the Philippines from Luzon, Visayas, and Mindanao (Table 3). 46.3%, 37.04% and 16.67% were assigned to Mindanao, Visayas and Luzon, respectively. Half of the respondents are from 4th class (26.85%) and 5th class (25.00%) municipalities.

For the rural health unit profiles of the physicians (Tables 4 and 5), data shows that 89.74% of them serve more than 10,000 people in their municipality. 55.26% of them have more than 200 patients seen per week and 34.78% and 33.04% see 5-10 and 21-30 dermatologic cases per week, respectively. This shows that dermatologic diseases remain as common reasons for consultation even in these far-flung areas. However, in these municipalities, only 25% have an accessible dermatologist, which further establishes that majority (75%) of them must manage skin diseases on their own. It was also noted that only 38.46% of the rural health units make official records or have available data on skin diseases that they see in their municipality and only 12.82% have educational activities on skin diseases. Our results also show that 42.37% of the physicians are able to refer to dermatologists through Viber and other online communication platforms, however, 13.56% refer only through phone call being unable to

**Table 2.** Class of Municipalities and Average Number of Patients of the Doctors to the Barrios

| Class | Annual Income (Pesos) | Population (by 1000) | Average number of patients per week | Average number of dermatologic cases per week |
|---|---|---|---|---|
| 1st class | >/= 15,000,000 | 67.5 (51 to 84.55) | 300 (250 to 400) | 23 (10 to 50) |
| 2nd class | 10,000,000-14,999,999 | 62 (54.25 to 68) | 310 (300 to 500) | 20 (15 to 25) |
| 3rd class | 5,000,000-9,999,999 | 39.5 (33.64 to 43.3) | 250 (200 to 500) | 20 (10 to 30) |
| 4th class | 3,000,000-4,999,999 | 28.82 (24.5 to 34.61) | 245 (150 to 300) | 15 (10 to 23) |
| 5th class | 1,000,000-3,000,000 | 15.3 (10.23 to19) | 200 (100 to 200) | 10 (7 to 20) |
| 6th class | < 1,000,000 | 8.4 (2.55 to 25) | 175 (90 to 275) | 6 (3 to 30) |
| **Overall** | | 29.98 (17.26 to 51) | 250 (150 to 300) | 15 (10 to 30) |

**Table 3.** Municipalities of the Doctors to the Barrios

| Frequency (%) | First Class 21 (19.44%) | Second Class 9 (8.33%) | Third Class 13 (12.04%) | Fourth Class 29 (26.85%) | Fifth Class 27 (25.00%) | Sixth Class 9 (8.33%) |
|---|---|---|---|---|---|---|
| Luzon 18 (16.67%) | Palanan, Isabela<br>Cabagan, Isabela<br>Gattaran, Cagayan<br>Lal-lo, Cagayan<br>Tuao, East Cagayan<br>Asingan, Pangasinan<br>Catanauan, Quezon<br>Tagkawayan, Quezon | | Calayan, Cagayan<br>Lasam, Cagayan | Burdeos, Quezon<br>Padre Burgos, Quezon<br>Iguig, Cagayan | San Quintin, Abra<br>Tinglayan, Kalinga | Uyugan, Batanes<br>Sabtang, Batanes<br>Bucloc, Abra |
| Visayas 40 (37.04%) | Puerto Galera, Oriental Mindoro<br>Sta. Cruz, Occidental Mindoro<br>San Jose, Occidental Mindoro<br>Talibon, Bohol<br>Dalaguete, Cebu | Goa, Camarines Sur<br>Mercedes, Camarines Norte<br>Bacacay, Albay<br>Palompon, Leyte<br>Victoria, Oriental Mindoro | Igbaras, Iloilo<br>Toboso, Negros Occidental<br>Mabinay, Negros Oriental<br>Nueva Valencia, Guimaras<br>Culion, Palawan<br>Pola, Oriental Mindoro | Dimasalang, Masbate<br>Leyte, Leyte<br>Barugo, Leyte<br>Sibunag, Guimaras<br>San Enrique, Negros Occidental<br>Siruma, Camarines Sur<br>Magarao, Camarines Sur<br>Gloria, Oriental Mindoro<br>Oslob, Cebu | Samboan, Cebu<br>San Rafael, Iloilo<br>San Rafael, Iloilo<br>Matuguinao, Samar<br>Biri, Northern Samar<br>Matuguinao, Samar<br>Sto. Nino, Samar<br>Samboan, Cebu<br>Pilar, Cebu<br>Gainza, Camarines Sur<br>Cabusao, Camarines Sur<br>Tomas Oppus, Southern Leyte<br>Pintuyan, Southern Leyte<br>Mercedes, Eastern Samar | San Sebastian, Samar |
| Mindanao 50 (46.30%) | Kapalong, Davao del Norte<br>Glan, Sarangani<br>Laak, Davao de Oro<br>Lupon, Davao Oriental<br>Maco, Compostela Valley, Davao<br>T'boli, South Cotabato<br>Impasugong, Bukidnon<br>Sto. Tomas, Davao del Norte | New Corella, Davao de Norte<br>Claver, Surigao Del Norte<br>Balingasag, Misamis Oriental<br>Opol, Misamis Oriental | Talaingod, Davai del Norte<br>Mawab, Compostela Valley<br>Cabanglasan, Bukidnon<br>Cabanglasan, Bukidnon<br>Sultan Naga Dimaporo, Lanao del Norte | Lanuza, Surigao del Norte<br>Lopez Jaena, Misamis Occidental<br>Don Voctoriano, Misamis Occidental<br>Magsaysay, Misamis Oriental<br>Medina, Misamis Oriental<br>Tagoloan, Misamis Oriental<br>Maigo, Lanao del Norte<br>Pantao Ragat, Lanao del Norte<br>Marawi City, Lanao del Sur<br>San Isidro, Davao del Norte<br>Basilisa, Dinagat Islands<br>Santiago, Agusan del Norte<br>Dinas, Zamboanga del Sur<br>Midsalip, Zamboanga del Sur<br>Jose Dalman, Zamboanga Del Norte<br>Sirawai, Zamboanga del Norte<br>Buldon, Maguindanao | Matungao, Lanao Del Norte<br>Salvador, Lanao del Norte<br>Sultan Mastura, Maguindanao<br>San Francisco, Surigao del Norte<br>San Isidro, Surigao del Norte<br>General Luna, Surigao del Norte<br>Alegria, Surigao del Norte<br>Tigbao, Zamboanga del Sur<br>Rizal, Zamboanga del Norte<br>Maimbung, Sulu<br>Turtle Islands, Tawi-Tawi | Concepcion, Misamis Occidental<br>Sapang Dalaga, Misamis Occidental<br>El Salvador City, Misamis Oriental<br>Pandag, Maguindanao<br>Datu Blah Sinsuat, Maguindanao |

show the actual lesions of their patients to dermatologists.

The most common skin diseases diagnosed by the respondents in their municipalities is shown in Figure 2. Among the groups of skin diseases, dermatitis (29.21%) was the most common followed by superficial skin and soft tissue infections (25.27%) and superficial fungal infection (14.34%). Among the dermatitis group of diseases, allergic/irritant contact dermatitis was the most frequent diagnosis. For superficial skin and soft tissue infections group, impetigo/bullous impetigo was the most common, and for the superficial fungal infection group, fungal infection (unspecified) was the most common diagno-

sis followed by tinea corporis. Overall, the top 5 most common skin diseases the respondents diagnosed were impetigo/bullous impetigo and scabies at 46.61% each, followed by allergic/irritant contact dermatitis at 43.22%, fungal infection (unspecified) at 25.42%, cellulitis at 20.34%, and carbuncle at 17.8%. Among these, impetigo/bullous impetigo (22.88%) frequently ranked as top 1 diagnosis followed by atopic dermatitis (13.56%) and scabies (10.17%).

The results for the most common medications prescribed for their patients showed congruent results with the top diagnosis they have recorded in their municipalities. The most com-

**Table 4.** Summary of Rural Health Unit Profiles

| | Valid observation | Frequency (%) |
|---|---|---|
| Total Population Served | | |
| ≤ 5000 | | 5 (4.27) |
| 5001-10000 | 117 | 7 (5.98) |
| >10000 | | 105 (89.74) |
| Total Number of Patients per Week | | |
| <50 | | 2 (1.75) |
| 50-100 | | 16 (14.04) |
| 101-150 | 114 | 15 (13.16) |
| 151-200 | | 18 (15.79) |
| >200 | | 63 (55.26) |
| Total Number of Dermatologic Cases seen per Week | | |
| <5 | | 12 (10.43) |
| 5-10 | 115 | 40 (34.78) |
| 11-20 | | 25 (21.74) |
| 21-30 | | 38 (33.04) |

**Table 5.** Rural Health Unit Profile on Dermatology

| | Frequency (%) |
|---|---|
| Accessible Dermatologist | 29 (25) |
| Available Data on Dermatologic Diseases | 45 (38.46) |
| Educational activities on Skin Diseases | 15 (12.82) |
| Guidelines or Protocols in the Management of Skin Diseases | 11 (9.57) |
| How do you refer | |
| Viber/Messenger/other online communication | 50 (42.37) |
| Phone call | 16 (13.56) |
| Transfer of patient to a Dermatologist | 47 (39.83) |
| Others | 26 (22.03) |



**Figure 2.** Most Common Skin Diseases by Group of Diseases and by Specific Diagnosis

mon medications prescribed were topical and systemic antibiotics, which were ranked as top 1 by 70.94% and 88.5% of the respondents respectively (Tables 6 and 7). The most commonly ranked as top 2 medications were systemic corticosteroids (52.78%) and topical antifungals (50.43%). Regarding the availability of medications, 97.41% have available oral antibiotics however only 20.69% and 53.45% have available oral antifungal and corticosteroids respectively. For the topical medications, 66.38% have available topical antibiotics, however, only 43.97% have available antifungals and steroids (Table 8).

In terms of knowledge for common dermatologic diseases, scores were classified to excellent (>85% correct answers), very good (75%-85% correct answers), good (60-75% correct answers) and insufficient (<60% correct answers). Table 9 summarizes the results for the knowledge of primary care physicians on common skin diseases. More than half or 55% of the physicians scored <60% correct answers classifying them under insufficient knowledge.

The possible barriers to the proper management of skin diseases ranked by the respondents were topped by lack of training (75.47%) and followed by lack of experience (73.58%). The rest were lack of medications (70.75%), lack of guidelines (60.38%), ineffective referral system (46.23%), and lack of educa-
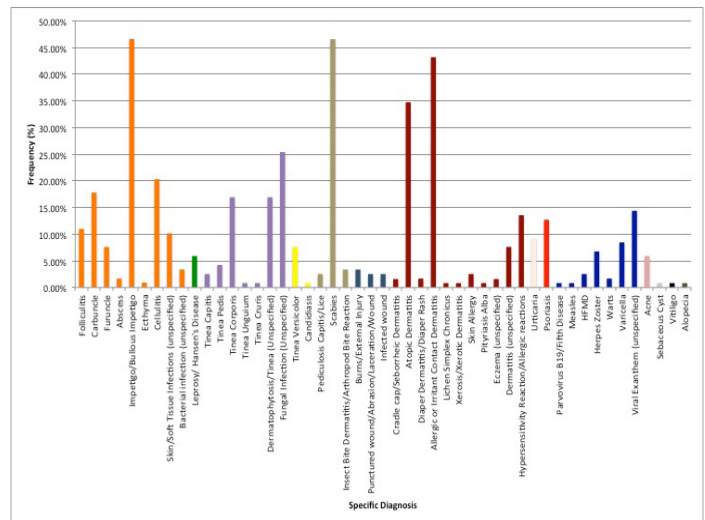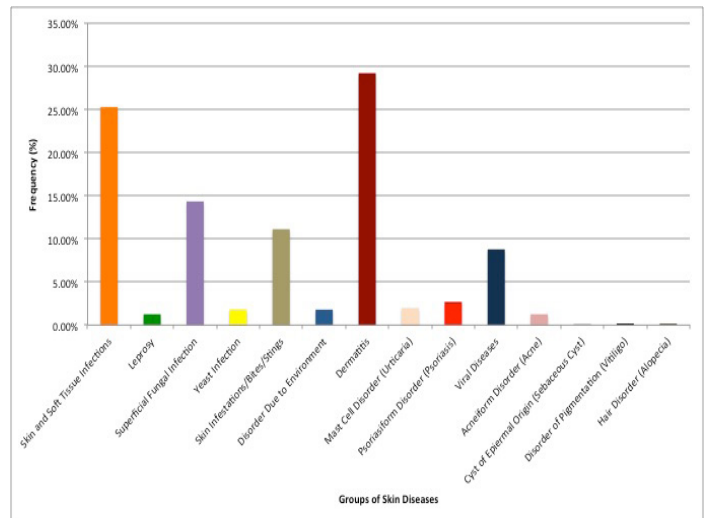
tional materials (42.45%) (Table 10).

Regarding the attitude of the respondents towards dermatological diseases (Table 11), majority (93.22%) of the DTTBs included in the study think that it is very important to have adequate knowledge on the diagnosis and management of common dermatological diseases and 84% think that it is important to have access to dermatology specialists. It is also shown that majority (91.45%) of the respondents are very interested in learning more about dermatological diseases.

Practices on diagnosis and management of skin diseases were also determined (Table 12). About 49.15% of the respondents always refer and 45.76% sometimes refer to dermatologists when they are unsure of their diagnosis. This means that almost half of them seek the expertise of dermatologists to help them diagnose and treat skin diseases that they encounter when

**Table 6.** Top 4 Most Common Topical Medications

| | | | Ranking | | | |
|---|---|---|---|---|---|---|
| | Valid observation | Median (IQR) | 1 | 2 | 3 | 4 |
| | | | Frequency (%) | | | |
| Antifungal | 117 | 2 (2 to 3) | 11 (9.40) | 59 (50.43) | 45 (38.46) | 2 (1.71) |
| Antibiotic | 117 | 1 (1 to 2) | 83 (70.94) | 24 (20.51) | 9 (7.69) | 1 (0.85) |
| Corticosteroids | 114 | 3 (2 to 3) | 23 (10.18) | 33 (28.95) | 55 (48.25) | 3 (2.63) |
| Retinoids | 110 | 4 (4 to 4) | 1 (0.91) | 1 (0.91) | 4 (3.64) | 104 (94.55) |

**Table 7.** Top 4 Most Common Systemic Medications

| | | | Ranking | | | |
|---|---|---|---|---|---|---|
| | Valid observation | Median (IQR) | 1 | 2 | 3 | 4 |
| | | | Frequency (%) | | | |
| Antifungal | 108 | 3 (2 to 3) | 5 (4.63) | 44 (40.73) | 50 (46.3) | 9 (8.33) |
| Antibiotic | 113 | 1 (1 to 1) | 100 (88.5) | 8 (7.08) | 4 (3.54) | 1 (0.88) |
| Corticosteroids | 108 | 2 (2 to 3) | 7 (6.48) | 57 (52.78) | 41 (37.96) | 3 (2.78) |
| Retinoids | 106 | 4 (4 to 4) | 1 (0.94) | 2 (1.89) | 10 (9.43) | 93 (87.74) |

**Table 8.** Availability of oral or topical medications for Dermatological Diseases

| Medication | Frequency (%) |
|---|---|
| Oral medications | |
|   Antifungal | 24 (20.69) |
|   Antibiotic | 113 (97.41) |
|   Corticosteroids | 62 (53.45) |
|   Retinoids | 4 (3.45) |
| Topical medications | |
|   Antifungal | 51 (43.97) |
|   Antibiotic | 77 (66.38) |
|   Corticosteroids | 51 (43.97) |
|   Retinoids | 0 |
| Emollients | 19 (16.38) |
| Others | 1 (0.86) |

**Table 9.** Knowledge of Primary Care Physicians on Dermatological Diseases

| Excellent | Very good | Good | Insufficient |
|---|---|---|---|
| | | Frequency (%) | |
| 2 (1.69) | 2 (1.69) | 49 (41.53) | 65 (55.098) |

**Table 10.** Difficulties or barriers encountered in the Management of Skin Diseases

| Excellent | Very good |
|---|---|
| Barriers | Frequency (%) |
| Difficulty/Barrier | |
| Lack of experience | 78 (73.58) |
| Lack of training | 80 (75.47) |
| Lack of guidelines | 64 (60.38) |
| Lack of educational materials | 45 (42.45) |
| Lack of medications | 75 (70.75) |
| Ineffective referral system | 49 (46.23) |

needed. However, majority of them (67.8%) sometimes treat patients even when they are unsure of the diagnosis.

Potassium hydroxide examination is a test to aid in the diagnosis of fungal infections. This is a simple test that can be done by medical technologists as well. Majority (87.29%) of the physicians do not do this or possibly do not have this test available. Only 5.08% of the respondents answered "always" in terms of the availability of medications for the skin diseases that they encountered further supporting the previous results saying that lack of medications is a barrier to managing common skin diseases.

With regards to self-perception of competency, what is noteworthy is that for the most common skin diseases diagnosed in their municipalities, majority of the physicians have rated themselves as just average to bad in their perceived ability to diagnose and manage these skin diseases (Figure 3).

## DISCUSSION
### KEY RESULTS
Primary care physicians are in the frontlines in managing skin diseases in geographically isolated areas with no access to dermatologists. As seen in the results, majority of them belong to 4th and 5th class municipalities, which implies that half of the respondents are assigned to municipalities with low-income and most probably the ones that are geographically isolated, making the DTTBs the only physicians that are being relied on for consultation. The primary care physicians assigned should therefore be knowledgeable of the common skin diseases they might encounter and there should be accessible dermatologists for referral of difficult cases that need specialized care.

According to El-Wahed et al. (2015) skin diseases are the third most common complaint encountered in primary care

**Table 11.** Attitudes of Primary Care Physicians on Dermatologic Diseases

| | Very important | Somewhat important | Not important |
|---|---|---|---|
| | | Frequency (%) | |
| Importance of having adequate knowledge on diagnosis and management of common dermatological diseases. | 110 (93.22) | 8 (6.78) | 0 |
| Importance of having access to a dermatology specialist. | 84 (71.19) | 33 (27.97) | 1 (0.85) |
| | Very interested | Somewhat interested | Not interested |
| Interest in learning more about dermatological diseases | 107 (91.45) | 10 (8.55) | 0 |

**Table 12.** Practices of Primary Care Physicians on Diagnosis and Management Dermatologic Cases

| | Always | Sometimes | Never |
|---|---|---|---|
| | | Frequency (%) | |
| Do you refer to a Dermatologist when unsure of a diagnosis? | 58 (49.15) | 54 (45.76) | 6 (5.08) |
| Do you treat a patient even when unsure of a diagnosis? | 25 (21.19) | 80 (67.8) | 13 (11.02) |
| Do you do KOH examination before treating suspected fungal infection? | 0 | 15 (12.71) | 103 (87.29) |
| Do you have available medications for the dermatological diseases that you encounter? | 6 (5.08) | 97 (82.2) | 15 (12.71) |
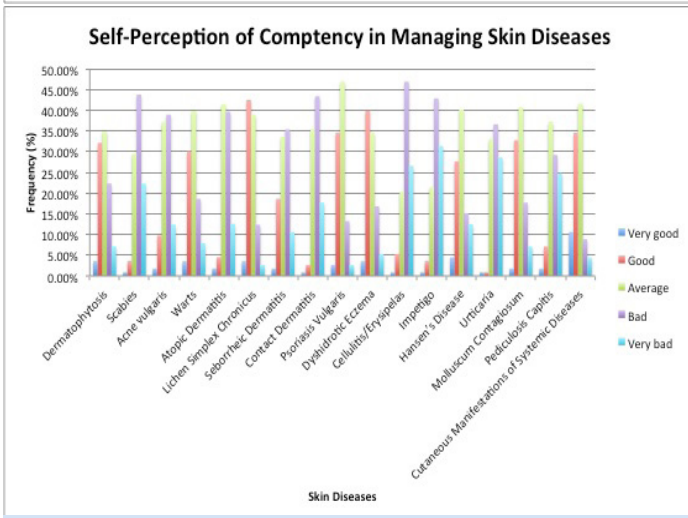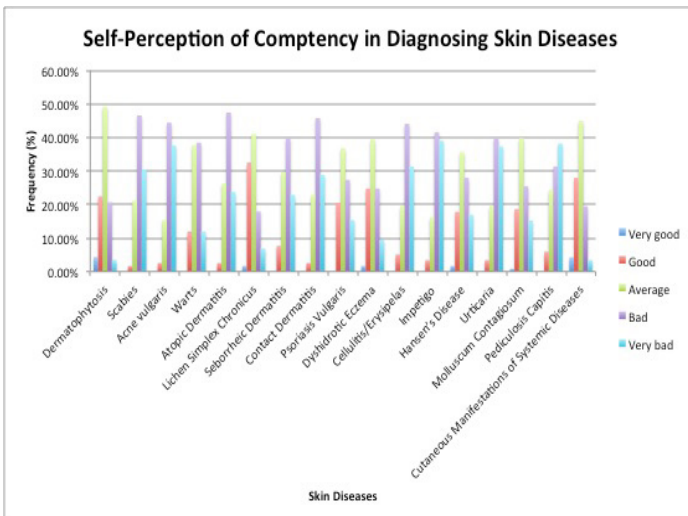




**Figure 2.** Self-Perception of Competency on Diagnosis and Management of Skin Diseases

and family practitioners are responsible for a large number of skin-related health care visits. In their study entitled "Pattern of Dermatologic Care by Family Physicians versus Dermatologists", the authors mentioned that the prevalence of skin diseases seen by family physicians were 30% of total patients in an outpatient clinic of primary health care.[9] Our study also shows that for DTTBs, skin complaints remain as a common reason for consultation being 6% of the average number of weekly consults. However, even when dermatologic diseases remain as common reasons for consultation, educational or preventive activities for skin diseases are not being prioritized or being given attention to in most of the municipalities. As mentioned previously, most of these municipalities belong to the low-income class, hence, it is vital to minimize costs for health care and one of the best ways to do this is to establish good educational and preventive measures for skin diseases.

In dermatology, examination of the actual lesions is invaluable in arriving at a correct diagnosis. This specialty has the advantage of being able to do consultations through online communication platforms since pictures or videos will make it possible for lesions to be examined. This technology should be maximized and be made available especially in geographically isolated areas. Our study showed that a significant number of our respondents still refer through phone calls being unable to show the actual lesions to the dermatologist they are referring to. It would be quite difficult or sometimes even impossible to accurately diagnose and manage skin diseases without being given the actual pictures of the lesions. For these doctors, a good internet connection or having access for face-to-face consults with dermatologists could make a big difference in the diagnosis and management of these diseases and in the prevention of further complications.

As seen in our results, the most common diseases that our respondents encounter are the ones caused by infection, infes-

tation, genetic, and environmental factors. These skin diseases affect quality of life significantly if not treated properly and immediately. It is essential therefore, that primary physicians can recognize these diseases and have basic knowledge on how to manage them and what medications to procure and dispense. The commonly prescribed medications were topical and systemic antibiotics followed by systemic corticosteroids and topical antifungals. However, despite being commonly prescribed medications for skin diseases, majority of our respondents do not have oral and topical medications available for free at their health centers. This means that patients must make out of pocket expenditures to be able to get access to medications for their skin diseases.

An evaluation study done by Bahelah et al. (2015) found out that their primary care physicians were not properly prepared to manage the common skin diseases in Aden, Yemen. The authors mentioned that their findings call for providing continuous medical education for primary care physicians in skin diseases.[4] Similarly, our results show that majority of our primary care physicians can be classified as having insufficient knowledge on common skin diseases. The implications of these results are that these physicians assigned to geographically isolated low-income municipalities, who are sometimes being solely relied upon for consultation, are inadequately equipped in terms of knowledge in diagnosing and managing common skin diseases.

Al-Zahrani et al. (2017) has also recognized that as medical knowledge expands, family physicians face an ever-increasing challenge in diagnosis and treatment of skin disorders. Because of this, they did a study on the knowledge, attitude, and practice of primary health care providers regarding common dermatologic problems, and they correlated their level of knowledge and practice gap with their background characteristics. They found out in the study that primary health care providers had insufficient knowledge regarding management of common skin disorders and that more than half of the primary health care physicians strongly agreed that they should have a role in the managing of common dermatological disorders.[3] The commonly reported barriers mentioned for proper diagnosis and management were lack of guidelines and training in dermatology. Similarly, our study results showed that our respondents have recognized the importance of being knowledgeable in the management of common skin diseases as primary care physicians and they have shown interest in learning more about these skin conditions. This can be attributed to the fact that they do play a major role in managing dermatological disorders in their own municipalities.  The barriers to the management of skin diseases mentioned in the study of Al-Zahrani et al. were also the top barriers identified by our respondents. These top 2 barriers, the lack of training and the lack of experience, may have resulted to lack of medications since without the knowledge on how to treat these diseases, our primary care physicians would not know

which medications to procure for their health units.

The study by El Wahed et al. (2015) recommended that proper qualification, support, and continuous medical education of family physicians are needed for management of different dermatological lesions making them up to date with current clinical guidelines. Also, they emphasized the importance of proper communication between primary care physicians and specialists for proper referral system for complicated cases.[9] Our results show that a proper referral system is also lacking since a significant number of our respondents do not have direct access to dermatologists and there are no definite dermatology referral centers assigned to their municipalities. Because of this, they proceed with the treatment of the skin diseases they encounter even when they are unsure of the diagnosis. To add to this, the respondents of the study were found to have average to low confidence in their ability to diagnose and manage skin diseases as shown in their self-perception of competency ratings. This may mean that more often than not they are indeed unsure of their dermatologic diagnosis and management.

These findings highlight the need to augment training, provide guidelines, and improve the referral system to make the delivery of skin-related health care services more efficient and accessible in the country.

### LIMITATIONS
Due to incomplete attendance of the physicians during their CME classes and distant areas of assignments, there was a difficulty getting all targeted respondents, however, we were able to recruit more than the minimum number of respondents computed for this study. Majority of the respondents completed the survey, however, there is a certain number of missing data due to items that were not answered which may introduce bias.

### CONCLUSION
Skin-related diseases make up a significant proportion of the respondents' weekly consults, however, a lack of basic knowledge in the diagnosis and treatment of skin diseases was noted. Majority of the respondents believe in the importance of having adequate knowledge on dermatological diseases and they are interested in learning more about skin diseases. Most of them also recognize the importance of having access to dermatologists.

Almost half of the DTTBs always refer to dermatologists when they are unsure of the diagnosis and a few of them never seek referral and proceed to treatment even when unsure of the diagnosis. Medications for common skin diseases are only sometimes available to most of the DTTBs. In terms of their self-perception of competency, the respondents have rated themselves average to bad in diagnosing and managing common skin diseases.

In this study, we were able to achieve more than the minimum number of respondents needed which strengthens the generalisability of our results. The findings of this study can

therefore be applicable to the other physicians in the group that we have sampled. However, at this point, we cannot say that these conclusions can be applicable to all primary care physicians in the entire country.

**RECOMMENDATIONS**
Further research to cover more municipalities, especially geo-graphically isolated areas, is recommended for generalizability of the data for the whole country. Municipal health officers and rural health physicians in other provinces and cities, even those that are not under the Doctors to the Barrios (DTTB) program may also be included. It is also recommended to improve the questionnaires and to develop a more standardized and validated tool for data gathering.

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