

# Knowledge, attitudes, practices, and challenges in the use of pharmacoeconomic evaluations among hospital pharmacists involved in the pharmacy and therapeutics committee in selected tertiary private hospitals in the National Capital Region

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**Abstract:** As healthcare undergoes rapid evolution globally, the accompanying rise in the cost of medicines and services underscores the importance of using pharmacoeconomic tools, especially in developing countries like the Philippines. This study aims to assess the application of pharmacoeconomic evaluations in selected hospitals within the Philippines, focusing on knowledge, attitudes, practices, and challenges among hospital pharmacists. Using convenience sampling, data was collected from 11 out of 30 tertiary private hospitals situated in the National Capital Region (NCR). A total of 24 hospital pharmacists participated by completing questionnaires focusing on four key parameters of pharmacoeconomic evaluations: knowledge, attitudes, practices, and challenges associated with utilizing these tools. Among the hospital pharmacists involved in this study, a substantial proportion (87.5%) reported utilizing pharmacoeconomic evaluations in their practice. Common practices included identifying medication costs and benefits and making formulary recommendations based on pharmacoeconomic indices, primarily focusing on initial evaluation stages. Respondents identified challenges such as limited understanding hindering effective application, with pharmacists predominantly focusing on traditional evaluations of efficacy, safety, and acquisition. Additionally, the complexity of pharmacoeconomic concepts and a lack of training to overcome them were noted. Despite the relative emergence of pharmacoeconomics in the Philippines, most Pharmacy and Therapeutics Committee hospital pharmacists from tertiary private hospitals in the National Capital Region maintained fair knowledge and attitudes towards pharmacoeconomics, regardless of years of experience. Most pharmacists also use pharmacoeconomic practices actively, but several challenges to their employment are still encountered. Increased training and reinforcements from international organizations are necessary to address these limitations.

Key Words: Attitudes; Challenges; Knowledge; Pharmacoeconomics; Practices



# 1. INTRODUCTION

Rising healthcare costs and numerous medication choices have underscored the importance of pharmacoeconomics, a field that evaluates the cost-effectiveness of medications (Alzarea et al., 2022). Pharmacoeconomic studies assess the therapeutic value of medical interventions, considering cost-benefit analysis, drug efficacy, and resource scarcity (Hasamnis et al., 2019). This field utilizes various techniques (CEA, CBA, CMA, CUA) to assess medications' economic impact (Drummond et al., 2015). This approach bridges economics, medicine, and humanity to achieve optimal allocation of healthcare resources.

Despite global challenges in affording and accessing quality healthcare, pharmacoeconomics empowers healthcare professionals to make informed decisions. By understanding the pharmacoeconomics of drug therapies, professionals can develop strategies to reduce medication costs and optimize patient care (Kumar & Baldi, 2013). Pharmacoeconomics can also guide drug use policies and influence prescribing practices to achieve better patient outcomes at lower costs (Sanchez, 1996; Anandabaskar, 2019).

Furthermore, pharmacoeconomics allows for comparisons between different treatments, aiding in selecting preventive measures and established treatments (Walley & Davey, 1995). This information is crucial for developing clinical practice guidelines, as demonstrated by managed care organizations implementing cost-effective smoking cessation programs (Baluch, 1995). Pharmacists can also leverage pharmacoeconomics to design patient-centered disease management programs (Mullins, 1997).

However, underutilizing pharmacoeconomics is a concern in developing nations due to limited knowledge, infrastructure, and trained analysts (Mori et al., 2013; Villa, 2012). Robust data collection on drug usage, safety, and pricing is essential for effective implementation. Without such data, decisions regarding drug selection lack a strong foundation, potentially leading to increased costs without improved treatment outcomes (Hasamnis et al., 2019).

Embracing pharmacoeconomic principles is vital for achieving the long-term goal of affordable, safe, and effective healthcare for all. Selecting, utilizing, and monitoring cost-effective medications ensures high-quality therapy at an acceptable price for the greatest number of people (Gajjar et al., 2018).

This study investigates how Pharmacy and Therapeutics Committee (PTC) hospital pharmacists in private tertiary hospitals within the National Capital Region (NCR) of the Philippines utilize pharmacoeconomic evaluations. The research focuses on four key areas: knowledge, attitudes, practices, and challenges related to these evaluations. Specifically, the study explores whether pharmacists' years of experience correlate with their understanding and perspective on using pharmacoeconomic evaluations. It will also assess how prevalent the use of these evaluations is among these pharmacists. Furthermore, the research will identify the most common practices employed by pharmacists from different hospitals when conducting pharmacoeconomic evaluations. Finally, the study will determine the most significant challenges that hinder the use of pharmacoeconomic evaluations in these tertiary private hospitals.

## 2. METHODOLOGY

This study utilizes a descriptive quantitative approach to investigate knowledge, attitudes, practices, and challenges related to pharmacoeconomic evaluations among hospital pharmacists within the National Capital Region (NCR). To be eligible, participants must be employed by a pharmacy and therapeutics committee (PTC) at a private tertiary hospital in the NCR and possess at least one year of experience in this role.

Convenience sampling was employed due to time constraints and anticipated low response rates within individual hospitals. All 30 NCR tertiary private hospitals were initially targeted; however, eight declined participation. The final sample frame comprised 22 hospitals. A response rate of 50% was achieved, with 11 hospitals participating. Hospitals A through G yielded one respondent each. Hospital H had two respondents, Hospital I had four, and Hospital J had five. Finally, Hospital K contributed six respondents, resulting in a total of 24 participants.

#### 2.1 Instrument Development

The study's researchers developed a survey instrument by adapting an existing one (Oamen et al., 2021) to better suit the Philippine context. This tool underwent expert evaluation to ensure content validity, meaning it accurately captured relevant information. Two experts assessed the relevance of each question using a four-point scale. The Individual Content Validity Index (I-CVI) for each question was calculated based on



these ratings. Questions deemed incongruent with the study's objectives or pharmacists' real-world experiences were removed or revised. The survey was reorganized into six sections, including a new section specifically addressing the implementation of pharmacoeconomic evaluations. The final survey administered to participants contained 43 questions.

#### 2.2 Data Analysis

Data analysis involved summarizing responses using frequencies and percentages for categorical data. Scores and continuous data were analyzed using means and standard deviations. Additionally, rankings of responses are presented. The Kruskal-Wallis H test, a non-parametric alternative to ANOVA, was utilized to compare medians across multiple groups without assuming normality. This test assigns ranks to data and evaluates for significant disparities based on rank sums. A significant p-value (set at 5%) indicates a likelihood of unequal medians among groups, prompting further investigation into specific differences. STATA software will be used for complex analyses, while Microsoft Excel will be used for basic tasks.

# 3. RESULTS AND DISCUSSION

| Table 1: Demogr | aphic profiles | s of the res | pondents |
|-----------------|----------------|--------------|----------|
|-----------------|----------------|--------------|----------|

| Profiles  | Frequency | Percentage |
|---|-----------|------------|
|   | (n=24)    |            |
| Years of Practice   |           |            |
| 5 years and below   | 16        | 66.67%     |
| 6 years to 10 years   | 3         | 12.50%     |
| 11 years to 20 years  | 2         | 8.33%      |
| 21 years to 30 years  | 2         | 8.33%      |
| 31 years and above  | 1         | 4.17%      |
|   |           |            |
| Practice of pharmacoeconomic<br>evaluations in respondent's |           |            |
| Yes   | 21        | 87 50%     |
| No  | 3         | 12.50%     |

<sup>1</sup>Frequencies and percentages are presented for categorical variables, while the means and standard deviations are presented for continuous variables.

Table 1 presents the demographic profiles of the respondents. In terms of years of practice, 16 (66.67%) have 5 years or less, 3 (12.50%) have 6 to 10 years, 2 (8.33%) have 11 to 20 years, 2 (8.33%) have 21 to 30 years, and 1 (4.17%) has 31 years and above. In addition, among the 24 respondents, 21 (87.50%) stated that they practice pharmacoeconomic evaluations in their institutions – a positive trend towards pharmacoeconomic use.

| Fable 2: Knowledge of pharmacoeconomic tools or |
|---|
| concepts of Pharmacy and Therapeutics Committee |
| Members   |

| State<br>ment |        | Res     | ponses <sup>1</sup> | Mean<br>Score | Ran<br>k |      |
|---------------|--------|---------|---------------------|---------------|----------|------|
| mon           | Poor   | Fair    | Good                | Excellent     |          | i.   |
| 1             | -      | 9       | 14                  | 1             | 2.67     | 7th/ |
|               |        | (37.50) | (58.33              | (4.17%)       | (0.56)   | 8th  |
|               |        | %)      | %)                  |               |          |      |
| 2             | -      | 6       | 15                  | 3             | 2.88     | 4th/ |
|               |        | (25.00) | (62.50)             | (12.50%)      | (0.61)   | 5th  |
|               |        | %)      | %)                  |               |          |      |
| 3             | -      | 5       | 15                  | 4             | 2.96     | 3rd  |
|               |        | (20.83) | (62.50)             | (16.67%)      | (0.62)   |      |
|               |        | %)      | %)                  |               |          |      |
| 4             | 1      | 10      | 11                  | 2             | 2.58     | 11th |
|               | (4.17) | (41.67) | (45.83)             | (8.33%)       | (0.72)   |      |
|               | %)     | %)      | %)                  |               |          |      |
| <b>5</b>      | -      | 13      | 7                   | 4             | 2.63     | 9th/ |
|               |        | (54.17) | (29.17)             | (16.67%)      | (0.77)   | 10th |
|               |        | %)      | %)                  |               |          |      |
| 6             | 1      | 9       | 12                  | 2             | 2.63     | 9th/ |
|               | (4.17) | (37.50) | (50.00)             | (8.33%)       | (0.71)   | 10th |
|               | %)     | %)      | %)                  |               |          |      |
| 7             | 1      | 13      | 9                   | 1             | 2.42     | 12th |
|               | (4.17) | (54.17) | (37.50)             | (4.17%)       | (0.65)   |      |
|               | %)     | %)      | %)                  |               |          |      |
| 8             | -      | 3       | 19                  | 2             | 3.79     | 1st  |
|               |        | (12.50) | (79.17)             | (8.33%)       | (3.90)   |      |
|               |        | %)      | %)                  |               |          |      |
| 9             | 1      | 7       | 15                  | 1             | 2.67     | 7th/ |
|               | (4.17) | (29.17) | (62.50)             | (4.17%)       | (0.64)   | 8th  |
|               | %)     | %)      | %)                  |               |          |      |
| 10            | -      | 8       | 15                  | 1             | 2.71     | 6th  |
|               |        | (33.33) | (62.50)             | (4.17%)       | (0.55)   |      |
|               |        | %)      | %)                  |               |          |      |
| 11            | -      | 6       | 15                  | 3             | 2.88     | 4th/ |
|               |        | (25.00) | (62.50)             | (12.50%)      | (0.61)   | 5th  |
|               |        | %)      | %)                  |               |          |      |
| 12            | -      | 3       | 17                  | 3             | 3.00     | 2nd  |
|               |        | (12.50) | (73.91)             | (12.50%)      | (0.52)   |      |
|               |        | %)      | %)                  |               |          |      |
|               |        | Mean    | of means            |               | 2.75     |      |
|               |        |         |                     |               | (0.64)   |      |

<sup>1</sup>Frequencies and percentages are presented for categorical variables, while the means and standard deviations are presented for continuous variables.

Table 2 presents responses regarding their knowledge of pharmacoeconomic tools and concepts, wherein the highest ranking was given to pharmaceutical strategic pricing, highlighting its significance in guaranteeing affordability, equal access to high-quality medications, and supply security. Return



Cost-minimization analysis, ranking third, involves assessing drug prices to determine the least expensive medicine or therapy method. This aligns with the "Generics Act of 1988," which emphasizes supplying drugs at the lowest cost, especially to indigent patients. Despite the use of cost-effectiveness analysis (CEA) in the Philippines' official formulary, the country's pharmacoeconomic capability remains low, warranting guidance from international authorities (Ball and Salenga, 2017). Naturalistic pharmacoeconomic studies, which gather data on patient compliance, received the least response, indicating a mean of 2.42. Cost-utility analysis, economic modeling in medicine selection, and economic evaluation alongside clinical trials face challenges due to resource constraints, infrastructure limitations, and expertise shortages.

Table 3: Attitudes of hospital pharmacists who are members of the Pharmacy and Therapeutics Committee toward application of pharmacoeconomic tools

| Sta |        | 1      | Response | $s^{1,2}$ |        | Mean   | Ran  |
|-----|--------|--------|----------|-----------|--------|--------|------|
| te  | Stro   | Disa   | Cann     | Agree     | Stron  | Score  | k    |
| me  | ngly   | gree   | ot say   |           | gly    |        |      |
| nt  | disa   |        |          |           | agree  |        |      |
|     | gree   |        |          |           |        |        |      |
| 1   | -      | 1      | 1        | 13        | 6      | 4.14   | 1st  |
|     |        | (4.76) | (4.76)   | (61.90)   | (28.5) | (0.73) |      |
|     |        | %)     | %)       | %)        | 7%)    |        |      |
| 2   | -      | -      | 4        | 13        | 4      | 4.00   | 2nd  |
|     |        |        | (19.05)  | (61.90)   | (19.0  |        |      |
|     |        |        | %)       | %)        | 5%)    | (0.63) |      |
| 3   | 1      | -      | 14       | 1         | 5      | 3.43   | 9th  |
|     | (4.76) |        | (66.67)  | (4.76)    | (23.8) | (1.03) |      |
|     | %)     |        | %)       | %)        | 1%)    |        |      |
| 4   | -      | 1      | 9        | 11        | -      | 3.48   | 8th  |
|     |        | (4.76) | (42.86)  | (52.38)   |        | (0.60) |      |
|     |        | %)     | %)       | %)        |        |        |      |
| 5   | -      | 1      | 6        | 13        | 1      | 3.67   | 5th/ |
|     |        | (4.76) | (28.57)  | (61.90)   | (4.76) | (0.66) | 6th  |
|     |        | %)     | %)       | %)        | %)     |        |      |
| 6   | 1      | 1      | 6        | 9         | 4      | 3.67   | 5th/ |
|     | (4.76) | (4.76) | (28.57)  | (42.86)   | (19.0  | (1.02) | 6th  |
|     | %)     | %)     | %)       | %)        | 5%)    |        |      |
| 7   | -      | 1      | 7        | 13        | -      | 3.57   | 7th  |
|     |        | (4.76) | (33.33   | (61.90)   |        | (0.60) |      |
|     |        | %)     | %)       | %)        |        |        |      |

| 8  | - | 1      | 12        | 8       | -        | 3.33   | 10th |
|----|---|--------|-----------|---------|----------|--------|------|
|    |   | (4.76) | (57.14)   | (38.10) |          | (0.58) |      |
|    |   | %)     | %)        | %)      |          |        |      |
| 9  | - | -      | 7         | 9       | <b>5</b> | 3.90   | 3rd/ |
|    |   |        | (33.33    | (42.86) | (23.8    | (0.77) | 4th  |
|    |   |        | %)        | %)      | 1%)      |        |      |
| 10 | - | 1      | 4         | 12      | 4        | 3.90   | 3rd/ |
|    |   | (4.76) | (19.05)   | (57.14) | (19.0    | (0.77) | 4th  |
|    |   | %)     | %)        | %)      | 5%)      |        |      |
|    |   | Μ      | ean of me | eans    |          | 3.46   |      |
|    |   |        |           |         |          | (1.08) |      |
|    |   |        |           |         |          |        |      |

<sup>1</sup> Only the responses of respondents who are practicing pharmacoeconomic evaluations in their institutions are included in the table.

<sup>2</sup> Frequencies and percentages are presented for categorical variables, while the means and standard deviations are presented for continuous variables.

Based on table 3, the highest rated statement was the one pertaining to their belief that these concepts are beneficial to hospital pharmacy practice. This is followed by their belief that identifying and valuing costs and benefits of alternative drug regimen will improve quality of decision making for patients' drug therapy and their willingness to undergo training to enhance their know-how in pharmacoeconomic concepts. On the contrary, the statements "cost of drugs should not be the main factor when deciding which drug to use for a specific person's treatment," "analyzing the costs and benefits of different medications is too complicated for the setting where I work," and "I doubt if we can accurately measure and put a value on the hidden costs and benefits in what we do" ranked the least among the respondents.

According to Marcinkowski and Reid (2019), attitudes comprise cognitive (knowledge), affective (emotions), and behavioral components. Hence, the results from Table 3 regarding the pharmacists' attitudes on pharmacoeconomics can be associated with the results gathered from Table 2 about their knowledge on pharmacoeconomic tools and concepts. The mean score for table 3 shows that the respondents may have a positive attitude toward pharmacoeconomics; however, their knowledge is still insufficient which may have affected their answers in Table 3 as one of the highest-rated statements in this table is their willingness to undergo training, hence, recognizing that there is still room for more learnings and improvement.

Conversely, Marcinkowski and Reid (2019) also mentioned that attitude serves as a vital precursor and/or predictor of behavior. Thus, despite the results of their attitudes, it is not strong enough to induce a

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behavioral change. Therefore, the results in Table 4 regarding their practice on pharmacoeconomic evaluations showed that pharmacists practice more on theoretical than practical applications.

Table 4: Practice of pharmacoeconomic evaluationsamong Pharmacy and Therapeutics Committee Members

| Sta |        | ]           | Response | $s^{1,2}$   |        | Mean   | Ran  |
|-----|--------|-------------|----------|-------------|--------|--------|------|
| te  | Stro   | Disa        | Cann     | Agree       | Stron  | Score  | k    |
| me  | ngly   | gree        | ot say   |             | gly    |        |      |
| nt  | disa   |             |          |             | agree  |        |      |
|     | gree   |             |          |             |        |        |      |
| 1   | -      | 1           | 1        | 13          | 6      | 4.14   | 1st  |
|     |        | (4.76)      | (4.76)   | (61.90)     | (28.5) | (0.73) |      |
|     |        | %)          | %)       | %)          | 7%)    |        |      |
| 2   | -      | -           | 4        | 13          | 4      | 4.00   | 2nd  |
|     |        |             | (19.05)  | (61.90)     | (19.0) | (0.63) |      |
|     |        |             | %)       | %)          | 5%)    |        |      |
| 3   | 1      | -           | 14       | 1           | 5      | 3.43   | 9th  |
|     | (4.76) |             | (66.67)  | (4.76)      | (23.8) | (1.03) |      |
|     | %)     |             | %)       | %)          | 1%)    |        |      |
| 4   | -      | 1           | 9        | 11          | -      | 3.48   | 8th  |
|     |        | (4.76)      | (42.86)  | (52.38)     |        | (0.60) |      |
|     |        | %)          | %)       | %)          |        |        |      |
| 5   | -      | 1           | 6        | 13          | 1      | 3.67   | 5th/ |
|     |        | (4.76)      | (28.57)  | (61.90)     | (4.76) | (0.66) | 6th  |
|     |        | %)          | %)       | %)          | %)     |        |      |
| 6   | 1      | 1           | 6        | 9           | 4      | 3.67   |      |
|     | (4.76) | (4.76)      | (28.57)  | (42.86)     | (19.0) | (1.02) |      |
|     | %)     | %)          | %)       | %)          | 5%)    |        |      |
| 7   | -      | 1           | 7        | 13          | -      | 3.57   |      |
|     |        | (4.76       | (33.33   | (61.90      |        | (0.60) |      |
|     |        | <b>`%</b> ) | ົ%)      | ົ%)         |        |        |      |
| 8   | -      | 1           | 12       | 8           | -      | 3.33   |      |
|     |        | (4.76       | (57.14   | (38.10      |        | (0.58) |      |
|     |        | %)          | %)       | <b>`%</b> ) |        |        |      |
| 9   | -      | -           | 7        | 9           | 5      | 3.90   | 9    |
|     |        |             | (33.33   | (42.86)     | (23.8  | (0.77) |      |
|     |        |             | %)       | %)          | 1%)    | -      |      |
| 10  | -      | 1           | 4        | 12          | 4      | 3.90   | 10   |
|     |        | (4.76       | (19.05)  | (57.14)     | (19.0  | (0.77) |      |
|     |        | %)          | %)       | %)          | 5%)    | -      |      |
|     | Mean o | of means    | 5        | -           | -      | 3.46   |      |
|     |        |             |          |             |        | (1.08) |      |

<sup>1</sup> Only the responses of respondents who are practicing pharmacoeconomic evaluations in their institutions are included in the table.

<sup>2</sup> Frequencies and percentages are presented for categorical variables, while the means and standard deviations are presented for continuous variables.

Table 4 presents the responses of the participants to the statements pertaining to their practice of pharmacoeconomic evaluations. The members were asked to rate their level of agreement with ten statements on a scale of "strongly disagree" to

"strongly agree". The mean score for each statement is shown in the table. Moreover, the table also shows the rankings of the statements based on the mean scores. Among the statements, brainstorming to identify costs and benefits of each medication therapy (statement 1), deciding which costs and benefits are significant (statement 2), making recommendations for Hospital Formulary based on pharmacoeconomic indices (statement 9), and evaluation of how much better someone's health gets by looking at both the quality and length of their life ranked the highest (statement 10). On the other hand. adopting appropriate pharmacoeconomic assumptions (statement 8), assigning monetary value to costs and benefits (statement 3), and specifying a set of options for each medication therapy ranked the least (statement 4).

Table 4 suggests that P&T committee members who use pharmacoeconomic evaluations are more likely to focus on the initial stages of the evaluation process, such as identifying costs and benefits. They may be less likely to delve into the more complex stages, such as assigning a monetary value to those costs and benefits.

Table 5: Challenges to the use of pharmacoeconomic evaluations among hospital pharmacists who are members of the Pharmacy and Therapeutics Committee Members

| Sta | ${ m Responses}^{1,2}$ |          |         |         |        | Mean   | Ran  |
|-----|------------------------|----------|---------|---------|--------|--------|------|
| te  | Stro                   | Disa     | Cann    | Agree   | Stron  | Score  | k    |
| me  | ngly                   | gree     | ot say  |         | gly    |        |      |
| nt  | disa                   |          |         |         | agree  |        |      |
|     | gree                   |          |         |         |        |        |      |
| 1   | -                      | 1        | 2       | 13      | 5      | 4.05   | 1st  |
|     |                        | (4.76)   | (9.52)  | (61.90) | (23.8) | (0.74) |      |
|     |                        | %)       | %)      | %)      | 1%)    |        |      |
| 2   | -                      | 3        | 3       | 15      | -      | 3.57   | 9th  |
|     |                        | (14.2)   | (14.29) | (71.43) |        | (0.75) |      |
|     |                        | 9%)      | %)      | %)      |        |        |      |
| 3   | -                      | -        | 5       | 14      | 2      | 3.86   | 3rd/ |
|     |                        |          | (23.81) | (66.67) | (9.52) | (0.57) | 4th  |
|     |                        |          | %)      | %)      | %)     |        |      |
| 4   | -                      | 1        | 5       | 15      | -      | 3.67   | 7th/ |
|     |                        | (4.76)   | (23.81) | (71.43) |        | (0.58) | 8th  |
|     |                        | %)       | %)      | %)      |        |        |      |
| 5   | -                      | 3        | 4       | 14      | -      | 3.52   | 10th |
|     |                        | (14.2)   | (19.05) | (66.67) |        | (0.75) |      |
|     |                        | 9%)      | %)      | %)      |        |        |      |
| 6   | -                      | -        | 2       | 17      | 2      | 4.00   | 2nd  |
|     |                        |          | (9.52)  | (80.95) | (9.52) | (0.45) |      |
|     |                        |          | %)      | %)      | %)     |        |      |
| 7   | -                      | <b>3</b> | 2       | 15      | 1      | 3.67   | 7th/ |
|     |                        | (14.2)   | (9.52)  | (71.43) | (4.76) | (0.80) | 8th  |
|     |                        | 9%)      | %)      | %)      | %)     |        |      |



| 8  | - | - | 6          | 14      | 1      | 3.76   | 5th  |
|----|---|---|------------|---------|--------|--------|------|
|    |   |   | (28.57)    | (66.67) | (4.76) | (0.54) |      |
|    |   |   | %)         | %)      | %)     |        |      |
| 9  | - | - | 9          | 9       | 3      | 3.71   | 6th  |
|    |   |   | (42.86)    | (42.86) | (14.2) | (0.72) |      |
|    |   |   | %)         | %)      | 9%)    |        |      |
| 10 | - | - | 6          | 12      | 3      | 3.86   | 3rd/ |
|    |   |   | (28.57)    | (57.14) | (14.2) | (0.65) | 4th  |
|    |   |   | %)         | %)      | 9%)    |        |      |
|    |   | Μ | lean of me | eans    |        | 3.77   |      |
|    |   |   |            |         |        | (0.67) |      |

<sup>1</sup> Only the responses of respondents who are practicing pharmacoeconomic evaluations in their institutions are included in the table.

<sup>2</sup> Frequencies and percentages are presented for categorical variables, while the means and standard deviations are presented for continuous variables.

Table 5 presents the responses of the participants to the statements pertaining to their challenges in using pharmacoeconomic evaluations. Among the statements, limited understanding of pharmacoeconomic concepts, fixation on traditional focus on clinical efficacy, safety, and acquisition cost alone, the complexity of pharmacoeconomic concepts, and inadequate skilled hands to train pharmacists in pharmacoeconomic concepts ranked the highest. On the other hand, lack of competence to evaluate available evidence, not having enough helpful rules and conditions in the working place, limited data on local references or competitors, and poor administrative support ranked the least.

Despite respondents demonstrating a fair to good knowledge of pharmacoeconomic tools and concepts, as indicated in Table 2 with a mean score of 2.75, Table 5 reveals that participants recognize their limited understanding of pharmacoeconomics as the top prevailing challenge to their practice of pharmacoeconomic evaluation. While this may seem contradictory, it's important to distinguish between having knowledge and understanding. Knowledge implies being aware of information, facts, or concepts, while understanding involves comprehending the relevance of information and being capable of linking it to other concepts as well as applying them in practical situations (Roush, 2017). The participants' limited understanding of pharmacoeconomics as a challenge is consistent with studies conducted by Alsultan (2011) and Suh et al. (2020), indicating that depletion of knowledge and lack of expertise pose significant risks to the limited application of pharmacoeconomic evaluations. This could be viewed as pharmacists being familiar with the concepts of pharmacoeconomic

evaluations such as CMA, CBA, CEA, and CUA. Nevertheless, when these concepts are put into practice to evaluate specific medications and interventions, their limited understanding is a barrier to their effective performance. Another challenge that respondents perceive is their tendency to rely on traditional approaches to evaluate clinical efficacy, safety, and cost acquisition of drugs, such as clinical trials. However, these approaches often fail to assess the drug's overall cost-effectiveness, as Suh et al. (2020) noted. This can be attributed to the poor pharmacoeconomic capacity within the Philippines (Ball & Salenga, 2017). A number of other factors challenge respondent's pharmacoeconomic practice, including the complexity of the pharmacoeconomic concept and the lack of skilled hands available to train pharmacists in the field.

Table 6: Comparison of knowledge, attitude, practice, and challenges among years of practice

| <u> </u>                           |             |
|------------------------------------|-------------|
| Variables                          | p-values1,2 |
| Knowledge of pharmacoeconomic      | 0.147       |
| tools and concepts                 |             |
| Attitude toward the application of | 0.619       |
| pharmacoeconomic tools             |             |
| Practice of pharmacoeconomic       | 0.542       |
| evaluations                        |             |
| Challenges to the use of           | 0.327       |
| pharmacoeconomic evaluations       |             |

<sup>1</sup> The analysis of variance or Kruskal-Wallis H test were used to test whether there are statistically significant differences in the mean scores between the groups, as appropriate.

 $^2$  A p-value threshold of 0.05 is used to determine whether to accept or reject the null hypothesis. If the generated p-value is less than 0.05, the null hypothesis is rejected. \*\* signifies that the p-value is statistically significant at the 1% level, while \* signifies that the p-value is statistically significant at the 5% level.

Table 6 presents the results of the statistical tests which verify whether statistically significant differences exist in the mean scores for knowledge which has a value of 0.147, attitude, 0.619, 0.542 value for practice, and challenges that has 0.542 among the respondents when grouped according to their years of practice. Based on the results, we find no statistically significant differences in the mean scores among the groups. The range of years of practice might be too narrow to detect a significant range between the values of knowledge, attitudes, challenges, and practices; at the same time, the years of practice in hospital pharmacy do not have any differences because the use of pharmacoeconomic evaluation is still progressing and in

the infancy stage despite its impact on pharmaceutical practice (Mori et al., 2013)

## 4. CONCLUSIONS

The use of pharmacoeconomic evaluations across hospitals in the Philippines remains largely undocumented in existing literature. To our knowledge, this is the first study covering the knowledge, attitudes, practices, and challenges among PTC hospital pharmacists in the employment of pharmacoeconomic evaluations in the Philippines.

Despite the field's infancy stage, tertiary private hospital pharmacists exhibit fair knowledge and attitudes towards pharmacoeconomics. The field's recent emergence may explain the minimal knowledge and attitude gaps among pharmacists with varying lengths of service under the PTC. The adoption of pharmacoeconomic evaluations, however, has already been taking place in a number of institutions in the country. Among the practices commonly performed were determined to be identifying and brainstorming potential costs and benefits associated with medications as well as making hospital formulary recommendations based on pharmacoeconomic indices. Most observed activities related to pharmacoeconomic evaluations concentrate on primary stages, with less emphasis on more intricate tasks like valuing both costs and benefits in monetary terms. These results align with the common challenges encountered in conducting such evaluations, including the inherent complexity of pharmacoeconomic principles and inadequate training to tackle this complexity.

It is thus recommended for institutions to provide training opportunities and conduct seminars covering pharmacoeconomics and its associated methods. Reinforcements from international organizations with established pharmacoeconomic systems may also be sought to improve the country's own systems. Higher education curriculum for pharmacy courses should also incorporate pharmacoeconomic concepts more comprehensively. Finally, as this study only collected data from a limited number of hospitals and respondents, it is recommended for future researchers to cover a broader scope of institutions and an increased number of participants.

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