Section: Community Medicine

Original Research Article

ASSESSING KNOWLEDGE ON THALASSEMIA AMONG HEALTH SCIENCE STUDENTS: A STUDY FROM THE UNIVERSITY OF NORTHERN PHILIPPINES

Tirth Jagdishbhai Patel[1], Hetvi Yogeshbhai Patel[2], Shalini Manojkumar Mishra[2], Priyambada Patra[2], Jignasa Chhaganbhai Dabhi[2], Harsh Manojkumar Patel[1]

[1]MBBS, Gullas College of Medicine – University of the Visayas, Philippines
[2]MBBS, GMERS Medical College and General Hospital, Vadnagar, Gujarat, India

Received : *27/03/2025*
Received in revised form : *18/05/2025*
Accepted : *09/06/2025*

Corresponding Author:
Dr. Hetvi Yogeshbhai Patel,
MBBS, GMERS Medical College and General Hospital, Vadnagar, Gujarat, India
Email: hetvipatel1928@gmail.com

DOI: 10.70034/ijmedph.2025.2.428

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (2); 2371-2375

ABSTRACT

Background: Thalassemia is one of the most common genetic blood disorders globally, with increasing prevalence in regions such as Southeast Asia and the Philippines. Despite the burden it poses on individuals and healthcare systems, public awareness—particularly among youth—remains inadequate. This study assessed the level of knowledge on thalassemia among students in health-related programs at the University of Northern Philippines and examined whether socio-demographic characteristics and sources of information influence their understanding of the disease.

Materials and Methods: A descriptive-comparative and correlational research design was employed. The study population included 101 BS in Community Health Management and Midwifery students, selected through total enumeration. Data were gathered using a researcher-adapted and content-validated questionnaire. Statistical tools included frequency, percentage, mean, independent t-test, and Pearson's correlation coefficient. Ethical principles such as informed consent and confidentiality were strictly observed.

Results: The respondents showed a high overall level of knowledge on thalassemia (mean = 66.64). The highest scores were in the domain of prevention, while the lowest were in understanding complications. Mass media emerged as the leading source of information, while school-based learning was cited least. A significant difference in knowledge was found between Indian and Filipino students in the domain of treatment ($p = 0.025$). Several socio-demographic factors, including age, sex, course, and father's occupation, showed significant correlations with knowledge in specific domains.

Conclusion: While health science students demonstrated generally high knowledge of thalassemia, specific gaps—particularly in recognizing complications and understanding treatment differences across cultures—remain. Educational institutions must enhance curriculum and outreach efforts to address these gaps.

Keywords: Thalassemia, health science students, knowledge, socio-demographic factors, Philippines

INTRODUCTION

Thalassemia is among the most widespread inherited blood disorders globally, posing a significant burden on healthcare systems, particularly in regions with high carrier prevalence. It is a genetic condition characterized by impaired hemoglobin production, resulting in chronic anemia and various systemic complications if left untreated.[1] The disorder is classified into two primary forms: alpha and beta thalassemia, which further present as minor, intermedia, or major types depending on the number and nature of gene mutations inherited.[2]

Globally, approximately 4.4 out of every 10,000 live births are affected by thalassemia, with a projected 900,000 clinically significant births expected in the next two decades.[3] The highest prevalence has been recorded in regions where malaria is or was endemic, including parts of Southeast Asia, the Mediterranean, the Middle East, and Africa.[4] In the Philippines, data from 2006 revealed 457 known thalassemia cases, with Luzon accounting for over 80% of these. Beta thalassemia was more common than alpha thalassemia in the local population.[5]

Despite the increasing global and local burden of thalassemia, awareness and knowledge about the disease remain limited, particularly among the youth. The lack of early diagnosis, insufficient public education, and socio-cultural beliefs further exacerbate the disease's impact.[6] Education plays a pivotal role in improving health literacy and preventive behavior, especially among future health professionals. Students enrolled in health sciences programs are expected to possess adequate knowledge of hereditary disorders like thalassemia, given their future roles in community education, disease prevention, and healthcare delivery.[7]

Studies have indicated that thalassemia remains underdiagnosed in many countries due to low public awareness and limited screening programs.[8] In countries such as Iran and those in the Mediterranean region, national control programs focusing on premarital screening, genetic counseling, and prenatal diagnosis have demonstrated substantial success in reducing disease incidence.[9] Similar strategies, if effectively implemented in the Philippines, could contribute to early detection and management.

The present study investigates the level of knowledge about thalassemia among students of the College of Health Sciences at the University of Northern Philippines. It aims to assess students' understanding across several key domains, including the disease process, signs and symptoms, prevention, treatment, and complications. Additionally, the study explores whether socio-demographic variables such as age, sex, nationality, parental education, and income are associated with variations in thalassemia knowledge. Understanding these correlations may help identify knowledge gaps and inform targeted educational interventions.

MATERIALS AND METHODS

This study employed a descriptive-comparative and correlational research design to assess the level of knowledge on thalassemia among health science students. The descriptive component examined the socio-demographic characteristics and knowledge levels of the respondents, while the comparative and correlational components explored differences and relationships between knowledge and selected variables.

Population and Sampling: The population comprised 101 students enrolled in Bachelor of Science in Community Health Management (BSCHM) and Midwifery programs at the College of Health Sciences, University of Northern Philippines. A total enumeration method was used, meaning all students in the identified sections (BSCHM Sections D and E and Midwifery) were included in the study.

Research Instrument: Data were collected using a structured questionnaire-checklist developed by the researchers and adapted from a validated tool used, with modifications to suit the local context. The instrument consisted of two parts:

Part I captured socio-demographic data: age, sex, nationality, course, parents' educational attainment and occupation, family monthly income, and sources of information on thalassemia.

Part II measured the level of knowledge on thalassemia across five domains: disease process, signs and symptoms, treatment and management, prevention, and complications.

Knowledge levels were rated using a five-point scale interpreted as follows: 81–100 (Very High), 61–80 (High), 41–60 (Fair), 21–40 (Low), and 0–20 (Very Low).

Data Collection Procedure: Permission to conduct the study was obtained from the Dean of the College of Health Sciences and respective instructors. The purpose of the study was explained to the participants, and informed consent was secured. The researchers personally administered and retrieved the questionnaires, ensuring minimal disruption to academic activities.

Ethical Considerations: The study upheld the ethical principles of informed consent, privacy, and confidentiality. Respondents were informed of their right to decline participation or withdraw at any point without penalty. Codes were assigned to ensure anonymity, and all data were securely stored and destroyed after use. Given that respondents were minors or young adults, special attention was given to safeguarding their welfare.

Data Analysis: Frequency and percentage were used to describe the demographic profile and sources of information. Mean scores determined the level of knowledge. Independent t-tests assessed differences in knowledge based on demographic groups. Pearson's correlation coefficient measured the relationship between socio-demographic variables and knowledge scores. All statistical analyses were conducted using standard methods, with a significance level set at 0.05.

RESULTS

[Table 1] summarizes key demographic characteristics. Most respondents were aged 18–20, nearly equally split by sex, predominantly Indian, and enrolled in BSCHM. A notable proportion had college-educated parents and professional or skilled workers as breadwinners.

As shown in [Table 2], mass media was the most commonly cited source of information on thalassemia, followed closely by interpersonal sources like family and friends. School was the least reported source.

Table 1: Socio-Demographic Profile of the Respondents (N=101).

Variable	Category	f	%
Age	18	28	27.70
	19–20	40	39.60
	21 & above	33	32.70
Sex	Male	50	49.50
	Female	51	50.50
Nationality	Indian	58	57.40
	Filipino	43	42.60
Course	BSCHM	58	57.40
	Midwifery	43	42.60
Father's Education	College Graduate & Higher	57	56.50
Mother's Education	College Graduate & Higher	46	45.50
Father's Occupation	Professional	43	42.60
Mother's Occupation	Skilled	33	32.70
Monthly Family Income	PHP 20,001–25,000	29	28.70

Table 2: Sources of Information on Thalassemia (Multiple Response)

Source of Information	f	%
Mass Media (TV, Internet)	49	48.50
Human (Peers, Family)	44	43.60
Print Media	29	28.70
School	18	17.80

[Table 3] reveals that respondents had a "High" level of knowledge across all domains of thalassemia, with the highest scores in the area of prevention and the lowest in understanding complications.

Table 3: Respondents' Level of Knowledge on Thalassemia (Overall and by Domain)

Domain	Mean Score	Interpretation
Disease Process	65.57	High
Signs and Symptoms	66.11	High
Treatment and Management	67.33	High
Prevention	68.32	High
Complications	65.85	High
Overall	66.64	High

[Table 4] highlights knowledge extremes across domains. Students were most aware that thalassemia is inherited and that its management depends on severity. However, misconceptions persisted around contagion, lesser-known symptoms, and the role of iron supplements.

Table 4. Items with Highest and Lowest Knowledge Scores by Domain

Domain	Highest Scoring Item	Mean	DR	Lowest Scoring Item	Mean	DR
Disease Process	Thalassemia is inherited	82.18	VH	It is contagious	42.57	Fair
Signs and Symptoms	Depends on type	79.21	High	Gallbladder stones/Mongoloid features	56.44	Fair
Treatment/Management	Depends on type and severity	90.1	VH	Iron supplements/Splenectomy	59.41	Fair
Prevention	Thalassemia is inherited, not preventable	72.28	High	Genetic counseling	63.37	High
Complications	Bone deformities	72.28	High	Risk for infection	60.4	Fair

[Table 5] shows a significant difference in knowledge between Indian and Filipino students only in the domain of treatment and management (p = 0.025). This may reflect cultural or educational differences in how diseases are perceived and treated.

Table 5: Significant Differences in Knowledge by Nationality (T-test Results)

Domain	p-value	Interpretation
Treatment/Management	0.025	Significant Difference
Other Domains	>0.05	Not Significant

[Table 6] reveals that several variables—particularly age, sex, nationality, and academic course—show statistically significant correlations with specific knowledge domains. Notably, younger students had better knowledge of the disease process, and school-based learning positively influenced prevention knowledge.

Table 6. Significant Correlations between Socio-Demographic Variables and Knowledge

Variable	Knowledge Domain	r	Interpretation
Age	Disease Process	-0.182	Significant (Inverse)
Sex	Signs and Symptoms	-0.218	Significant
Nationality	Treatment/Management	0.196	Significant
Course	Treatment/Management	-0.196	Significant

Father's Occupation	Complications	0.276	Significant
School as Info Source	Prevention	0.287	Significant

[Table 7] consolidates the major findings, emphasizing that while knowledge is generally high, targeted gaps remain, particularly in lesser-known complications and among specific demographic subgroups.

Table 7: Overall Summary of Findings

Focus Area	Key Result
Overall Knowledge Level	High (66.64)
Strongest Knowledge Domain	Prevention
Weakest Knowledge Domain	Complications
Major Source of Information	Mass Media
Group with Highest Knowledge Gaps	Filipino students (in treatment domain)
Strongest Correlating Variable	School as info source (r=0.287)

DISCUSSION

This study aimed to assess the level of knowledge on thalassemia among health science students at the University of Northern Philippines and to examine how socio-demographic factors and sources of information influence their understanding of the disease. The findings revealed a generally high level of knowledge across all five domains—disease process, signs and symptoms, treatment and management, prevention, and complications—suggesting that students enrolled in health-related programs possess a solid foundational awareness of thalassemia.

The high overall knowledge score (mean = 66.64) is consistent with the academic background of the respondents, most of whom were pursuing BS in Community Health Management or Midwifery. These programs likely expose students to topics in hematology, genetics, and public health, which may explain their familiarity with the disease.[10] Among all domains, prevention scored the highest, indicating strong awareness that thalassemia is inherited and that genetic counseling and premarital screening are important preventive measures. This aligns with global findings that emphasize the success of prevention campaigns in countries like Cyprus, Iran, and Greece, where public education and mandatory screening have substantially reduced new cases.[11]

Interestingly, students scored lowest in the domain of complications, particularly regarding thalassemia-related infections. While many were aware of skeletal deformities and iron overload, fewer recognized increased infection risk as a common complication. This gap is noteworthy, as infections remain a leading cause of morbidity and mortality in thalassemia patients due to splenectomy or transfusion-related immunosuppression.[12]

The study also found that mass media was the primary source of information for nearly half of the respondents, surpassing both school and human sources. This finding supports earlier studies that highlight the role of television, the internet, and social platforms in shaping health knowledge, especially among the youth.[13] However, the relatively low ranking of schools as a source (17.8%) suggests a missed opportunity for formal education to reinforce accurate and comprehensive health information.

A significant difference in knowledge was observed between Indian and Filipino students regarding treatment and management (p = 0.025), possibly due to differing cultural perspectives, exposure to health systems, or educational experiences. This echoes prior literature noting that cultural beliefs and healthcare accessibility influence how individuals perceive genetic disorders and their treatments.[14]

Moreover, correlation analysis revealed that age, sex, nationality, course, father's occupation, and school-based learning significantly influenced knowledge in specific areas. Younger students, for instance, demonstrated better understanding of the disease process, which may reflect their greater use of digital technology for information access.[15] Female students scored higher in recognizing signs and symptoms, possibly because of heightened sensitivity to health issues, as found in previous gender-based studies on health awareness.[16] Likewise, students whose fathers held professional occupations tended to have higher knowledge, likely due to increased exposure to health information and resources at home.[17]

Importantly, school-based learning was significantly correlated with better knowledge of preventive strategies (r = 0.287), underscoring the vital role of academic institutions in promoting health literacy. This suggests that curriculum enhancements, targeted lectures, and campus health seminars could further strengthen knowledge among health science students.

CONCLUSION

In conclusion, while knowledge on thalassemia among the respondents is high, notable gaps exist—particularly in understanding complications and recognizing school as a central source of information. Addressing these issues through integrated educational programs and targeted awareness campaigns could better prepare future healthcare professionals in thalassemia prevention, diagnosis, and care.

REFERENCES

1. Zhang S, Chen Z, Chen M, Huang H. Current status and trends in thalassemia burden across South, East and Southeast Asia, 1990–2021 a systematic analysis for the global burden of

disease study 2021. BMC Public Health. 2024 Dec 18;24(1):3472.

2. Sadiq IZ, Abubakar FS, Usman HS, Abdullahi AD, Ibrahim B, Kastayal BS, Ibrahim M, Hassan HA. Thalassemia: Pathophysiology, diagnosis, and advances in treatment. Thalassemia Reports. 2024 Oct 15;14(4):81-102.
3. Iyevhobu KO, Okobi TJ, Usoro ER, Ivie AA, Ken-Iyevhobu BA, Victoria OO. Overview of beta-thalassemia. InThalassemia Syndromes-New Insights and Transfusion Modalities 2023 Nov 22. IntechOpen.
4. Musallam KM, Lombard L, Kistler KD, Arregui M, Gilroy KS, Chamberlain C, Zagadailov E, Ruiz K, Taher AT. Epidemiology of clinically significant forms of alpha-and beta-thalassemia: a global map of evidence and gaps. American journal of hematology. 2023 Sep;98(9):1436-51.
5. Capanzana MV, L Mirasol MA, Smith G, Angeles-Agdeppa I, Perlas L, Los Reyes F, et al. Thalassemia and other hemoglobinopathies among anemic individuals in Metro Manila, Philippines and their intake of iron supplements. Asia Pac J Clin Nutr. 2018;27(3):519-526.
6. Irshad T. The social meanings and implications of the Beta-thalassaemia trait among South Asian women in England. Available From: https://core.ac.uk/download/pdf/228190637.pdf
7. Wong LP, George E, Tan JA. A holistic approach to education programs in thalassemia for a multi-ethnic population: consideration of perspectives, attitudes, and perceived needs. J Community Genet. 2011 Jun;2(2):71-9.
8. Badagabettu S, Archana MV, Jomon CU. Awareness on thalassemia and opinion of carrier screening among young women from selected undergraduate colleges of udupi district. Clinical Epidemiology and Global Health. 2022;14:100978.
9. Saffi M, Howard N. Exploring the effectiveness of mandatory premarital screening and genetic counselling programmes for β-thalassaemia in the Middle East: a scoping review. Public Health Genomics. 2015;18(4):193-203.
10. Sialvi HS, Umar G, Hamid S, Khadija G. Awareness, Attitude and Knowledge about Thalassemia among Students of Different Disciplines. Journal of Islamic International Medical College (JIIMC). 2021;16(2):117-21.
11. Angastiniotis M, Eleftheriou A. National prevention strategies for the control of haemoglobin disorders. A special reference to the countries of the Middle East. PROCEEDINGS and ABSTRACT BOOK. 2017;102(s1):1-5.
12. Ricerca BM, Di Girolamo A, Rund D. Infections in thalassemia and hemoglobinopathies: focus on therapy-related complications. Mediterranean journal of hematology and infectious diseases. 2009;1(1):e2009028.
13. Palanisamy B, Kosalram K, Chinnaiyan S. Social networks and social support: Parents experiences in the management of thalassemia, a complex lifelong inherited blood disorder, in the indigenous context–A qualitative study. Clinical Epidemiology and Global Health. 2024;25:101491.
14. Wong LP, George E, Tan JA. Public perceptions and attitudes toward thalassaemia: Influencing factors in a multi-racial population. BMC public health. 2011;11:1-9.
15. Saulsberry AC, Hodges JR, Cole A, Porter JS, Hankins J. Web-based technology to improve disease knowledge among adolescents with sickle cell disease: pilot study. JMIR pediatrics and parenting. 2020;3(1):e15093.
16. Hossain MJ, Das M, Akter MM, Maruf MF, Towhid ST. Safe Marriage for Thalassemia Prevention: The Gap Between Knowledge and Practices among Bangladeshi University Students, 28 December 2023, PREPRINT (Version 1) available at Research Square [https://doi.org/10.21203/rs.3.rs-3801245/v1]
17. Manzoor I, Zakar R. Sociodemographic determinants associated with parental knowledge of screening services for thalassemia major in Lahore. Pakistan journal of medical sciences. 2019;35(2):483.