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Medical students' perception on use of abbreviations during clinical years

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Abstract

Introduction: An abbreviation is a shortened form of word or phrase commonly used in medical practice for convenience. Misinterpretation of abbreviations can lead to confusion and medical errors. Studies have shown the use of abbreviations early as the first year in medical school.

Method: A cross-sectional questionnaire-based survey among undergraduate clinical year medical students in the tertiary care center of Kathmandu Valley was performed from December 2017 to April 2018.

Result: A total of 97 participants. The prevalence of abbreviation use was 95%. Senior students correctly interpreted both standard and non-standard abbreviations. The majority of students learned to use abbreviations from the medical officer's note.

Conclusion: Students consider abbreviations are acceptable despite having difficulties in interpretation. Hospitals or concerned departments should regulate the use of standard abbreviations.

Keyword: abbreviation, clinical years, medical error, medical students, perception

Introduction

An abbreviation is "a shortened form of word or phrase".¹ Abbreviations and acronyms are used interchangeably. Abbreviations use has been common practice on medical record keeping and in discussion among medical professionals.²

It has been reported that over 7,000 deaths per year might be attributed to medical errors in which abbreviation use was significant contributors.³ A study showed the habit of using abbreviations in medical practice was acquired as early as the first clinical year of medical school.⁴ A study from Pakistan showed that there is a knowledge gap among trainees in medicine regarding the meaning and usage of common abbreviations.⁵ These factors identified as significant factors for medical errors that have become patient safety issue.⁶

This study aims to assess the perception and knowledge of abbreviation by medical students in clinical years.

Method

This is a cross-sectional, questionnaire-based survey. The study was done among undergraduate medical students in clinical years (third, fourth, and final year) from December 2017 to April 2018 at a university hospital in Kathmandu Valley.

For this project, the calculated sample size was 96. Adding 10% for non-response, the total sample size was 106. Students in the third year and first half of the 4th year rotate through all clinical departments and are considered to be in junior clerkship and after that, they repeat rotations in the same departments as junior clerkship years thus classified as senior clerkship students. All students in clinical years were included in the sample frame. Students were then stratified based on junior vs senior clerkship years. Samples were then selected by the simple random method in each stratum with the help of computer-generated random numbers.

The survey tool used in similar research⁴ was requested and that was used with certain modifications according to our setting. This survey tool contained a self-administered questionnaire containing five sections for the data collection. It was validated among a group of 2nd-year medical students who were not included in this research.

The first section contained questions designed to identify demographic data. The second section was used to assess the frequency of abbreviation usage, the source of the acquiring habit of using abbreviations and the reason for abbreviation use. The third section explores perception regarding the use of abbreviations through a five-point Likert scale (1: strongly agree, 2: agree, 3: neutral, 4: disagree, 5: strongly disagree) in several statements. The last two sections of the questionnaire assessed the student's ability to correctly interpreting a list of standard abbreviations. The list of abbreviations was compiled from a pilot study in which abbreviations encountered in the admission notes of patients from different departments of the same institution were observed. A total of 40 abbreviations were selected from the collected pool of abbreviations by random sampling. A score of 1 was assigned to each correct response thus 40 being the overall score (Summation of scores on standard and non-standard abbreviation).

Written consent was taken from each participant before the distribution of the survey tool. Participants were allowed 30 minutes to complete the questionnaire without assistance. Ethical clearance was obtained from the Institutional review committee of the same center.

Data was entered in Epi-info and then subsequently analyzed using Statistical Package for Social Science (SPSS) version 20 for Windows. Descriptive analysis was used to describe the demographic data of the respondents. A chi-square test was used to compare proportions. Mann-Whitney test was used to compare the medians between different batches while the Wilcoxon signed-

rank test was used to compare the medians between the same groups. A p-value of < 0.05 with 95% confidence interval was considered significant.

Result

A total of 97 students participated in the study, out of 106 sampled, giving a response rate of 91.5%. Forty-six students were from junior clerkship and 51 from senior clerkship. Among them, 87(90%) of students were from a pure science background in higher secondary education while remaining were from paramedical background (Health-related). Most of their family occupation was non-health related 85(88%).

The pattern of abbreviation use is shown in detail in table 1. Almost every student i.e. 92

(95%) has used abbreviations during their clinical rotations.

Both junior and senior clerkship students encountered problems due to abbreviation use. They perceived problems such as delay in administering therapy, delay in the procedure, wrong diagnosis made, delay in diagnosis, wrong therapy given and wrong procedure done. Many students also felt the use of ambiguous abbreviations in the wards caused the patient care to be delayed.

The perception of students regarding abbreviation use is shown in table 2. The response to each statement was recorded on a Likert scale. The mean score for each statement was calculated and compared between the two groups as shown in the Table 2.

Table 1. Abbreviation use by different levels of study

Items	Junior Clerkship (%)	Senior Clerkship (%)	Total
	Numbers (%)	Numbers (%)	Numbers (%)
Frequency of abbreviation use			
All the time	1 (2.2)	6 (11.8)	7 (7.2)
Most of the time	10 (21.7)	19 (37.3)	29 (29.9)
Sometimes	23 (50)	21 (41.2)	44 (45.4)
Rarely	9 (19.6)	3 (5.9)	12 (12.4)
Never	3 (6.5)	2 (3.9)	5 (5.2)
Source of learning to use abbreviations			
Teachers	15 (32.6)	25 (49)	40 (41.2)
Medical Officer	10 (21.7)	14 (27.5)	24 (24.7)
Nurses	6 (13.6)	5 (9.3)	11 (11.3)
Copied from Medical officers' entry	24 (52.2)	21 (41.2)	45 (46.4)
Copied from nurse's entry	7 (15.2)	5 (9.8)	12 (12.3)
Reason for using abbreviations			
Saves time	27 (58.7)	25 (49)	52 (53.6)
Saves space	17 (37)	19 (37.2)	36 (37.1)
Tedious to write full sentences	15 (32.6)	12 (23.5)	27 (27.8)
It is inconvenient	22 (47.8)	23 (45.1)	45 (46.4)
Everyone understands the abbreviations	3 (6.5)	5 (10.9)	8 (8.2)

Table 2. Perceptions on the use of abbreviation, among junior and senior clerkship, mean score

Items	Junior Clerkship	Senior Clerkship
I have difficulty interpreting abbreviations.	1.48	1.90
I often encounter abbreviations in my study.	0.85	0.90
I often have to guess the meaning of the abbreviations	1.5	1.73
I feel frustrated when interpreting abbreviations.	2.09	2.39
I find interpreting abbreviations delays my work.	1.85	2.22
I think abbreviations are necessary.	1.26	1.51
I think abbreviations are acceptable.	1.35	1.27

Table 3. The proportion of junior and senior clerkship students who correctly interpreted standard abbreviations

Acronym	Expanded Form	Junior	Senior
		Number (%)	Number (%)
IHD	Ischemic Heart Disease	44 (95.7)	46 (90.2)
EMG	Electromyography	37 (80.4)	48 (94.1)
PROM	Premature Rupture of Membrane	3 (6.5)	11 (21.6)
IUGR	Intrauterine Growth Retardation	33 (71.7)	50 (98)
CSOM	Chronic Suppurative otitis media	22 (47.8)	38 (74.5)
DUB	Dysfunctional Uterine Bleeding	27 (58.7)	46 (90.2)
NS	Normal Saline	44 (95.7)	50 (98)
STI	Sexually transmitted Infection	31 (67.4)	42 (82.4)
OGTT	Oral Glucose Tolerance Test	43 (93.5)	51 (100)
BP	Blood Pressure	46 (100)	51 (100)
GOO	Gastric Outlet Obstruction	34 (73.9)	51 (100)
HBV	Hepatitis B virus	44 (95.7)	47 (92.2)
ORIF	Open Reduction and Internal Fixation	24 (52.2)	48 (94.1)
OT	Operation Theatre	43 (93.5)	48 (94.1)
GCS	Glasgow Coma Scale	36 (78.3)	51 (100)
JVP	Jugular Venous Pressure	46 (100)	51 (100)
APH	Ante-Partum Hemorrhage	31 (67.4)	50 (98)
HOPI	History of Presenting Illness	43 (93.5)	50 (98)
AKI	Acute Kidney Injury	44 (95.7)	50 (98)
ALD	Alcoholic Liver Disease	28 (60.9)	42 (82.4)
NSAID	Non-steroidal Anti-Inflammatory Drugs	43 (93.5)	51 (100)
TTN	Transient Tachypnoea of Newborn	21 (45.7)	37 (72.5)
SPO ₂	Saturation of Peripheral Oxygen	0 (0)	1 (2)
LFT	Liver function test	45 (97.8)	51 (100)
AIDS	Acquired Immuno Deficiency Syndrome	45 (97.8)	49 (96.1)
BMI	Body Mass Index	44 (95.7)	50 (98)

Table 4. The proportion of junior and senior clerkship students who correctly interpreted non-standard abbreviations

Acronym	Expanded Form	Junior	Senior
		Number (%)	Number (%)
WOG	Week of Gestation	26 (56.5)	45 (88.2)
PILCOD	Pallor Icterus Lymphadenopathy, Oedema, Dehydration	42 (91.3)	49 (96.1)
CST	Continue Same Treatment	6 (13)	16 (31.4)
Tx	Treatment	40 (87)	48 (94.1)
↓ed	Decreased	44 (95.7)	50 (98)
C/O	Complaint of	20 (43.5)	43 (84.3)
S/O	Suggestive of	33 (71.7)	36 (70.6)
P/A	Per Abdomen	41 (89.1)	48 (94.1)
C/S	Culture and Sensitivity	20 (43.5)	20 (39.2)
K/C/O	Known Case of	38 (82.6)	46 (90.2)
O/E	On examination	42 (91.3)	48 (94.1)
Pt	Patient	46 (100)	49 (96.1)
TC	Total Count	39 (84.8)	49 (96.1)
R/E	Routine Examination	41 (89.1)	50 (98)

Table 5. Comparison of overall score (correct interpretation of given 40 acronyms) between different years of study, context of acronym, gender, family occupation and type of higher secondary education

	Year of Study		P value
	Junior	Senior	
Median	33	35	0.000*
Mean±SD	29.98±6.49	34.45±3.24	
Context of Acronym			
	Overall Score without context	Overall Score after context given	
Median	34	35	0.001#
Mean±SD	32.33±5.5	32.76±5.47	
Gender			
	Male	Female	
Median	35	34	.533*
Mean±SD	32.44±1.44	32.1±5.73	
Family Occupation			
	Health Related	Non related	
Median	35	34	0.47*
Mean±SD	35.33±1.44	31.9±5.73	
Higher Secondary education			
	Paramedical	Pure Science	
Median	32	35	0.242*
Mean±SD	29.1±8.46	32.7±4.99	

*Mann Whitney U test, [#]Wilcoxon Signed Rank Test

Students in senior clerkship better interpreted both standard and non-standard abbreviations compared to junior clerkship students (Table 3 and 4). Students gave different answers for ambiguous acronym such as STI (soft tissue injury vs sexually transmitted infection), CS (Culture sensitivity vs Caesarean Section), TC (Total count vs Take Care). When the students were provided with the context of the acronym (i.e. settings in which abbreviations are used, e.g. LFT is a laboratory investigation), they were better able to correctly interpret the abbreviation though the difference was marginal (Table 5). However, there was no statistical difference between scores of students according to their gender, family background (health-related vs non-related) and higher secondary level of education (paramedical vs pure science).

Discussion

This study showed that there is no relation of gender, family background (health-related vs non-related) and prior educational background (paramedical vs science) in using the abbreviations. No similar studies have been conducted in the past to compare.

Most of the students in clinical years reported using abbreviations. Senior clerkship students were better able to correctly interpret the abbreviations probably because they learned more abbreviations due to longer clinical exposure. A similar study conducted in Malaysia has shown that medical students start using abbreviations as early as the first medical year.⁴ Similarly, this study also showed that as the clinical years or exposure increases students gain more exposure to abbreviation and their ability to correctly identify the acronyms also increase.^{4,5}

Most of the students of both groups were able to correctly interpret standard abbreviations such as "BP", "JVP", "NS", and "OGTT" probably because they are widely used. However, students of both groups had difficulties in correctly interpreting a few standard abbreviations (e.g. PROM and sPO2) despite their frequent use in clinical practice. Misinterpretation of the abbreviation could have serious consequences as it has been identified as a factor leading to medical errors that have become an international patient safety issue.^{2,4,7}

The students had difficulty in correctly interpreting abbreviations that may have more than one meaning in general use such as STI (soft tissue injury vs sexually transmitted infection), CS (Culture Sensitivity vs Caesarean Section), TC (Total count vs Take care). Participants had difficulty in interpreting ambiguous abbreviations (e.g.: STI, Tx, MCL, N/A) in similar research conducted in Malaysia.⁴ Despite facing difficulties it was interesting that both the group felt abbreviations are both necessary and acceptable because they save time.

Students learned medical abbreviations either from notes or verbal communication during the teaching and learning period. Most commonly, they learned it from the medical officer's note/entry and nursing staff. The use of abbreviation by medical officers may be non-standard and often relevant only to the department or hospital.⁴

The majority of the student who faced perceived problems due to abbreviation said they felt there was a delay in administrating therapy followed by a delay in the procedure. Along with this, a small number of students encountered mismanagement of patients. However, this result should be interpreted with caution as medical students might not be competent to correctly identify mismanagement. Despite saying this, medical mismanagement has been seen in various studies due to the misinterpretation of abbreviations. It has been reported that over 7,000 deaths per year might be due to medical error which can be secondary to misinterpretation of abbreviation.^{2,3}

This study included junior and senior clinical year students as participants; instead, if students in each year of medical school were included, a better picture could be obtained. This study has intentionally left the abbreviation from the prescription of the out-patient department (OPD) since it is believed medical students are confined to OPD but not to the dispensing of medicine so they may not be able to point out errors. This study was

conducted among students in clinical years of Bachelor of Medicine and Bachelor of surgery but the medical entry or notes are frequently referred by nurses during patient management thus further study can be conducted among the nurses to evaluate the impact of inappropriate acronym use.

Conclusion

Medical students commonly used abbreviations in clinical years of study, despite facing difficulties in understanding and interpretation. They still considered abbreviations are appropriate and acceptable. Hospitals or concerned departments should regulate the use of standard abbreviations.

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Conflict of Interest

None

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None

Author Contribution

JB designed the study, collected data and participated in manuscript writing. UP participated in data collection, analysis, manuscript writing and editing.

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