Correlation Study between Laboratory Performance and Internship Grades of BS Medical Technology Students

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ABSTRACT

Clinical laboratories identified quality indicators that measure the performance related to clinical practice and patient care. The goal of improving performance in the laboratory and health care setting is to improve student outcomes. This study aimed to determine the relationship between performance indicators in laboratory courses and the internship grade and performance of BS Medical Technology students during their internship program. The study used the descriptive-correlation method of research by presenting the laboratory performance of the graduating batch of SY 2015-2016 of BS Medical Technology, demonstrated through the performance indicators (PI), and the internship grades they earned from their training hospitals. Laboratory performance is based on a 14-item skills inventory for performance indicators (PI) in laboratory courses, which measured laboratory performance on clinical quality (LPCQ). The internship grade that was given by Training Officers of the Laboratory Department of their training hospitals is based on KSA (knowledge, skills, and attitudes) of interns during their 6-month clinical training. Data was summarized using frequency distribution tables and weighted means, and resulting correlation was determined using Pearson R. The study revealed that the identified skills of students were recognizing limitations, planning and organizing effectively, and reporting data accurately. Students, however, need to improve on practicing safety procedures and working under pressure. This showed that there is a significant relationship between laboratory performance and internship grade. The study suggested to focus on monitoring the performance of students, learning styles, how to plan learning experiences, and how to assess students' skills based on set student outcomes to develop more useful information for quality improvement.

Keywords: Quality indicators, laboratory performance, internship, clinical skills, performance indicators

INTRODUCTION

Quality in medical laboratory practices plays a significant role in diagnostic and hospital laboratories. There are different areas in clinical laboratories that demand competence and excellence in utilizing innovative technologies. It consists of laboratory testing and procedures that are needed in detection, diagnosis, and treatment of diseases. In the Medical Technology program, it consists of academic, professional courses in the curriculum and six months clinical training in accredited tertiary hospitals. The training composed of rotational duties in different sections that define the work of medical technologists.

Several studies stated that specific practices such as monitoring, performance and target setting have significant impact and association on interns and laboratory staff. According to Plebani (2015), total testing process (TTP) ensures quality in laboratory medicine by accurate decision making and effective patient care. In this view, all testing cycles should be assessed, monitored, and improved to decrease error rates; thereby, improve the safety of patients. Use of quality indicators to assess and monitor the quality system of clinical laboratory services is an extremely valuable tool in keeping the total testing process (Agarwal, 2012). Association with hospital leadership, policy, and guidelines are also important driving forces for quality improvement. Based on the study of Tsai (2015), he stated that hospitals that paid greater attention to clinical quality had better-monitored quality performance.

The academic internship of Medical Technology students is composed of analytical procedures in clinical sections, such as: *Hematology, Serology and Immunology*, *Clinical Microscopy*, *Clinical Chemistry*, *Histopathology*, and *Blood Banking* which measures the reliability of laboratory results. Monitoring the laboratory performance of interns and staff have a fundamental role in improving the quality of laboratory management and services. Carvalho (2015), revealed that supervised academic internship, develop skills and patient care management among Nursing interns. According to Fan (2015), however,

competency-based education is worth implementing and may close the gap between education and the ever-changing work environment. Moreover, according to Gude (2017), obtaining high-performance ratings from observers, through the period of internship, may become more conscious of how demanding clinical communication with patients may be.

On the other hand, academic performance is widely considered a major predictor of a university's success. The study showed that involvement in the excellence initiative (i.e., in graduate schools and/or clusters of excellence) moderated the relationship between extrinsic work motivation and academic performance (Wollersheim, 2015). Furthermore, according to Alotaibi (2016), self-directed learning readiness (SDLR) level positively influenced students' academic performance positively, and that students' perceptions of their learning environment played a significant role in determining their level of SDLR and academic performance. This study demonstrates that there is a relationship between academic performance and internship of Medical Technology students. As Salem (2016) concluded that pre-clinical GPA is strongly correlated with and can predict medical students' performance during clinical years. He highlighted the importance of evaluating the academic performances of students in pre-clinical years before they move into clinical years in order to identify weak students to mentor them and monitor their progress.

Nowadays, not just intellectual capabilities play an important role in the field of medicine with the rising standards and increasing complexity of modern medical care. There is a need to further introduce clinical students to a variety of difficult or unusual cases to enhance their problem-solving skills in the clinical settings (Arigbede, et al., 2014). The clinical area is the venue where students must relate theory to practice, learn the necessary technical and interpersonal skills, make clinical judgments, become socialized into the profession, and begin to appreciate its values and ethics. In spite the fact that theoretical knowledge acquired in the classroom setting is necessary to enhance the clinical performance of students in the same way that the latter reinforces what is learned in the classroom, academic grade does not always reflect the competence of students in the clinical setting (Buhat-Medoza, et al., 2014).

The researcher's study showed how performance indicators really affect internship performance of Medical Technology students. To explain further, a study by Lee and Vermillion (2018) revealed that clinical competencies and a structured clinical examination were strong predictors of internship performance. The undergraduate assessments as a whole showed a significant collective relationship with internship performance.

This study focused on two components that could contribute to a student's internship performance. The researcher believe that these are procedural knowledge and laboratory skills that will enhance the quality of Medical Technology laboratory practices.

Review of Literature

Quality indicators

Laboratory testing and services have an important role in the provision of health care and in utilization and reimbursement. Assessing the quality of laboratory services using quality indicators or performance measures requires a systematic, transparent, and consistent approach to collecting and analyzing data (Shahangian & Snyder, 2009). Quality indicator is important to identify and monitor the problem encountered in the laboratory. This may improve patient safety and clinical standards among clinical laboratories. Chawla, et al. (2010) stated that working constantly will improve the outcome of indicators by taking corrective measures over a period of time. Identifying reliable quality indicators is a difficult task to quantify the quality of laboratory procedures and medical services. Based on the result of the study of Plebani (2013), a model of quality indicators (MQI) must be developed to avoid the multitude of errors the continue to occur in pre and post analytical phases in the laboratory.

Clinical education

Students of allied health programs who have positive clinical education often accept employment offered by their hospital affiliations where they get their clinical experiences. Most allied health

professionals are not trained to be educators; to improve student clinical experiences, students were assessed regarding their learning experiences during clinical internships. Results revealed by the study of Rogers, Lautar, & Dunn (2010) that both students and clinical supervisors identified similar professional development training needs as they related to the improvement of teaching skills. The identified needs were understanding different learning styles, planning learning experiences prior to students' arrival, giving feedback, and assessing student skills based on learning goals. Students and clinical supervisors agreed on the areas that need to be addressed to improve the learning experiences in clinical education. Clinical competence and learning outcomes of undergraduate students is necessary to evaluate during clinical trainings. Despite the changes in health care systems, clinical education improved the curricula and learning outcomes. Findings indicated in the study of Tanda & Denham (2009) that wise use of skills laboratories, consistent clinical placement, supportive clinical learning environments, and effective coaching by clinical educators positively affect student outcomes. On the other hand, the assessment of clinical competence is fundamental to ensure that students can exercise their duties in patient care. Objective Structured Clinical Examination (OSCE) is a method of assessing student's clinical knowledge, professional judgment, interpersonal and professional communication, and problem-solving skills. They reported high levels of satisfaction, and noted that the OSCE was a positive assessment experience (Beitia, etal., 2019).

Clinical trainings and Internship

Clinical internships for allied health programs are significant to develop the clinical skills and critical thinking skills of medical students. This consists of internship duty and clinical practice that is dependent on the responsibility of teaching strategies in the hospital. With modern facilities and information technology, the hospital used management network system. The study of Zia, et al. (2019) revealed that 96.30 percent of teachers considered the system to be helpful for improving teaching quality and 92.60 percent of administrators thought it was useful for implementing management.

Objectives of the study

The study determined the relationship between performance indicators (PI) in laboratory subjects and the final grades given by hospitals as internship grades for the graduating batch of BS Medical Technology in SY 2015-2016. Specifically, the following objectives were attained:
1. Present the demographic profile of the graduating batch of SY 2015-2016 for Medical Technology in LPU–St Cabrini in terms of gender and training hospital;
2. Present the performance indicators for BS Medical Technology students in terms of individual skills and the overall laboratory performance; and
3. Determine the relationship of performance indicators and the internship grades of BS Medical Technology students.

METHODOLOGY

The study used the descriptive-correlation method of research by presenting the laboratory performance of the graduating batch of SY 2015-2016 of BS Medical Technology, demonstrated through performance indicators (PI) and the internship grades they earned from their training hospitals. The subjects in this research represent 42 students of BS Medical Technology who graduated this SY 2015-2016. The laboratory performance is based on a 14-item skills inventory for performance indicators (PI) in laboratory subjects which measured the laboratory performance on clinical quality (LPCQ). On the other hand, the internship grade given by the Training Officers of the Laboratory Department of their training hospitals is based on the KSA (knowledge, skills, and attitudes) of interns during their 6-month clinical training. The hospitals followed a standardized hospital training manual as a rating tool for the students. This is based on the required performance for Medical Technology practitioners and is a gauge they use to determine performance for their own Medical Technologists.

Data was summarized using frequency distribution tables and weighted means and resulting correlation was determined using Pearson R through SPSS 19.

RESULTS AND DISCUSSION

Table 1. Demographic profile of the respondents

Training Hospital	Frequency	Percentage
SFCMC	27	64.00
BMC	5	11.90
SLH	10	23.80
TOTAL	42	100.00
Sex	Frequency	Percentage
Female	29	69.00
Male	13	31.00
TOTAL	42	100.00

Table 1 indicates that majority of the respondents were deployed in St. Frances Cabrini Medical Center (SFCMC) with 64 percent and most of the interns were female which is 69 percent while male interns were 31 percent.

Table 2. Performance indicators on individual skills and overall laboratory performance

Performance Indicator	Weighted Mean
Follows safety procedures	3.24
Performs accurately under pressure	3.29
Recognizes normal and abnormal results	3.31
Conforms to testing procedures, policies, and protocols	3.38
Understands the theoretical basis for laboratory tests	3.40
Demonstrates problem solving and critical thinking ability	3.40
Learns new procedures in a reasonable amount of time	3.48
Possesses technical skills to work effectively	3.55
Has overall ability to perform accurate and reliable laboratory testing	3.55
Performs and accurately interprets quality control procedures	3.57
Makes sound judgments	3.60
Calculates, transcribes, and reports data accurately	3.74
Plans and organizes work effectively and efficiently	3.76
Recognizes limitations and seeks help when necessary	3.83
Laboratory performance	3.51

Table 2 reveals that the students got the highest score with a mean of 3.83 on the area of *recognizes their limitation and seeks help when necessary*. The second highest mean of 3.76 was garnered by *plans and organizes work effectively and efficiently*. This pertains to operational skills of laboratory equipment and technical procedures in the laboratory setting. Students usually ask for necessary instructions and assistance from laboratory teachers before actual performance and experimentation. Based on the study of Weyrich (2009), peer-assisted learning is a successful method for learning technical procedures and can be just as effective as the training provided by an experienced faculty staff. On the other hand, the two lowest scores with weighted means of 3.24 and 3.29 respectively, were on *safety procedures* in the laboratory and *working under pressure*. The results showed that students need to review and practice quality and safety in handling patients in laboratory classes and improve their skills in working under pressure. The findings in a study by Carr, et al. (2014) support the value of combining undergraduate assessment scores to assess competence and predict future performance.

Table 3. Relationship between laboratory performance and internship grades

	R	p-value	Interpretation
Laboratory Performance (LPCQ) Vs. Internship Grades	0.59	0.000	Highly significant

It is shown in Table 3 that there is a highly significant relationship to the laboratory performance of students in their professional subjects with internship grades which range from 79 – 93 given by the training hospitals to interns during their internship duty for a period of six months. This explained that laboratory procedures, protocols, guidelines, and skills taught by the Medical Technology faculty follow the standard quality system of affiliated training hospitals. Therefore, students must improve their knowledge, skills, and attitude while practicing the profession in the school laboratory prior to the internship program. According to the study of Madurapperuma & Thilakerathne (2014), the internship program contributes significantly and positively towards enhancing the knowledge base and motivational level of students. This experience can make subsequent study more meaningful and is useful to develop students professionally before entering the workplace.

CONCLUSION AND RECOMMENDATION

The researcher concluded that laboratory performance has a significant relationship with the academic internship supervised by training hospitals. These findings help increase understanding of the importance of the assessment on the performance indicators in laboratory practices. Second, to improve quality indicators to assess and monitor the performance of interns in the clinical laboratory. The study suggested to include academic grades and the performance of students in the board exam to develop more useful information for quality improvement.

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