EVALUATION FOR A POSSIBLE POLYSMONGRAPHY PROGRAM WITHIN THE WALLACE COMMUNITY COLLEGE RESPIRATORY THERAPY PROGRAM

BY

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MHS, Washburn University, 2018

A PROJECT

SUBMITTED TO THE DEPARTMENT OF ALLIED HEALTH

OF WASHBURN UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF HEALTH SCIENCE

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WASHBURN UNIVERSITY OF TOPEKA

DECEMBER, 2018

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December 2018

Abstract

A sleep disorder is a medical disorder of the sleep patterns of a person. This can lead to numerous physical, mental and emotional effects. Sleep disorders are increasing at a rapid pace and affects about a third of adult people in the United States. This pattern of sleep has been linked to several chronic diseases and conditions (Phillips & Gozal, 2015). These sleep disorders can be diagnosed in a sleep center through the use of a test known as polysomnogram. This immediate need of sleep medicine and the severe shortage of qualified technologists has led to the idea of evaluating the need for a polysomnography program at Wallace Community College (WCC) in Dothan, Alabama. The focus will be on a short certificate program, which is two semesters and will lead graduates to gainful employment in this field.

Table of Contents

List of Figures

Sleep technology, also known as Polysomnography Technology, is an allied health-care occupation that consists of a study of sleep cycles and behavior, usually done overnight in a sleep center. This study involves observing a person at sleep while continuously charting brain waves, muscle activity, breathing, eye movements, and heart rhythms (Des Jardins, 2016). The results of this study allow doctors to track the different stages of sleep. These stages are classified as nonrapid eye movement (NREM) and rapid eye movement (REM) sleep. These two stages are associated with dreaming. The test can track other characteristics of sleep, such as the number of times the patient awakens. It can also evaluate any abnormal sleeping behaviors, such as sleepwalking or nightmares. In addition, the study can evaluate sleeping disorders that include obstructive and central sleep apnea. These studies are done to set up proper treatment for sleep-related breathing disorders or to show why a treatment is not working. Polysomnography technologists measure and collect brain waves, breathing patterns and limb movement to help diagnose patients' sleep disorders. By applying non-invasive monitoring equipment, the sleep technologist simultaneously monitors electroencephalography, electrooculography, electromyography, electrocardiography, multiple breathing variables and blood oxygen levels during sleep. Technologists provide supportive services related to the ongoing treatment of sleep-related problems (Phillips & Gozal, 2015).

Purpose Statement

The purpose of this paper is to identify if a need exists for a Polysomnography program at Wallace Community College in Dothan, Alabama. Polysomnography technologists assist in the clinical assessment, physiological monitoring and testing as well as diagnosis, management and prevention of sleep related disorders by using a variety of diagnostic and therapeutic tools. This

specialty provides care to patients of all ages. The incidence of sleep disorders continues to increase, as does awareness of the many different types of disorders and their treatments. Data performed from a quantitative assessment of sleep laboratory activity in the United States revealed an estimated 1,165,135 polysomnograms per year (Tachibana, Ayas, & White, 2002). Sleep labs across the United States continue to grow with this increased demand. There are only 2,500 sleep centers that are accredited in the United States. The geographic area of a 75 mile radius surrounding Dothan, Alabama performs an estimated 900 to 1100 sleep studies on a monthly basis (S. Tillus, personal communication, November 1, 2018). Data continues to show it is not the lack of cases needed to be done but lack of registered technologists as well as facilities available for these types of procedures (Colten and Altevogt, 2006). These slots are filled for up to three to four months in advance. Sleep disorders have become so common in the U.S. that the Centers for Disease Control and Prevention now consider it as an epidemic (Wells & Vaughn, 2013). This supports the need for the demand of trained professionals in this field of study.

Significance of the Project

This project places high significance on the importance of sleep apnea and the role it places on each individual's health. The consequences of not getting enough sleep are associated with an increased risk of chronic diseases and conditions. These conditions may include diabetes, cardiovascular disease, stroke, obesity, and depression. Adults should sleep seven or more hours each night for optimal health; however more than a third of the U.S. adult population reports insufficient sleep (Wells & Vaughn, 2013). As technology advances, the greater need will be placed on highly trained individuals to accurately perform these sleep studies (Colten and

Altevogt, 2006). To determine local need for sleep technologists, health care personnel including local physicians, respiratory therapists, and nurse practitioners were surveyed. The results of this survey identify a need for a short certificate degree in Polysomnography at WCC.

Project Objectives

1. Research the demographic need for a short certificate program for a Polysomnography Technology Program and how to make it a success at Wallace Community College.
2. Select curriculum for successful completion of a short certificate for Polysomnography Technology program.
3. Identify the best teaching platform in the education of students for sleep study: Hybrid, online, or face to face.

Background of the problem or activity

The SWOT framework shows the strengths and weakness of implementing a short certificate sleep program at Wallace Community College.

Strengths: The demand for this area is high. The closest educational program to Wallace Community College is located four hours away. The program will offer high value based on students meeting and passing all necessary measures to become successful in their new career. There are approximately 900 to 1100 sleep studies done in this geographic area monthly (S. Tillus, personal communication, November 1, 2018). This is an estimated number per interviews with local department heads of the sleep centers in this geographic area. There is an increased need in each of these facilities for a registered polysomnography technologist. The program will

be accredited by Commission on Accreditation for Respiratory Care (CoARC) and will strive to meet and exceed the benchmark of first time pass rate of 80% (CoARC, 2015).

Weaknesses: The factors that would prevent the program from meeting and exceeding their goals would be poor leadership coupled with insufficient resources to meet the upcoming demand. This can be controlled by having a superior instructor to lead this program.

Opportunities: Sleep medicine is a growing allied health specialty within respiratory therapy. These fields ranked fifth among allied health providers in expected growth of positions through 2012 (Kuehne, 2017). The growth for this particular program would further open the market place for upcoming graduates. These graduates would be able to work both in the sleep lab and in respiratory care. This could potentially increase their job choices as well as increase their starting salary.

Threats: Challenges would focus on meeting all potential benchmarks and correcting these deficits when identified during program assessment.

Theoretical Framework

A sleep disorder is a medical disorder of the sleep patterns of a person. This can become very serious leading to numerous physical, mental and emotional effects. Sleep disorders affect about a third of adult people in the United States (Colten and Altevogt, 2006). This pattern of sleep has been linked to several chronic diseases and conditions. These sleep disorders can be diagnosed in a sleep center through the use of a test known as polysomnogram. Based on the growth in demand and the shortage of specialized skills in sleep disorder treatment, developing

future technologists for this field is required (Colten and Altevogt, 2006). This immediate need has led to the idea of evaluating the need for a polysomnography technologist program at WCC.

The focus will be on implementation of this program as a two semester short certificate program. Respiratory students will be eligible once they have completed and received their degree in Associates in Applied Science for Respiratory Therapy. These graduates have proven solid cognitive and psychomotor skills. This will allow them to be able to navigate a hybrid course for the short certificate. A hybrid course will be cost effective as the students will be attending affiliates of Wallace Community College to complete their clinical rotations. Each affiliate's contract will state a preceptor will be provided to guide and aid in teaching students in clinical assessment, physiological monitoring, testing, diagnosis and management of a sleep disorder. The clinical rotations will be held in hospital sleep labs, private sleep centers, laboratories for sleep related breathing disorders, and home medical equipment companies. This is part of all affiliates' agreement within the allied health field.

Literature review

Many patients live day to day not even aware that they have a sleep disorder and how it is impacting their quality of life. A sleep disorder is a medical disorder of the sleep patterns of an individual. This can become serious enough to affect their normal physical, mental and emotional function. This can be diagnosed in a sleep center by the use of a simple test known as a polysomnogram. Sleep apnea is a term that means cessation of breathing which is an absence of air flow for ten seconds or more. This type of apnea may be obstructive, central, or mixed. Patients who experience sleep apnea breathe normal during the day and are completely unaware they stop breathing during sleep. There is a high demand due to the increasing demand for

diagnosing and treating the increasing number of different sleep disorders. There are many different disorders of sleep but the most noted are Obstructive sleep apnea, Central sleep apnea, and mixed sleep apnea (Epstein et al., 2009).

Obstructive sleep apnea (OSA) is a common disorder affecting two to four percent of the adult population (Epstein et al, 2009). OSA is characterized by repeated episodes of apnea and hypopnea during sleep. While undiagnosed OSA is common in adults, the severity spectrum is wide not to mention cardiovascular and behavioral morbidity in patients with this condition. The brain of an individual with OSA senses that breathing is difficult, which leads to frequent awakenings during the night. This causes low quality of sleep and can decrease oxygen saturation during sleep. Over the long term, this can begin to affect their work life and social activities. This may lead to high blood pressure, heart failure, heart attack, and or stroke (Kacmarek, Stoller, & Heuer, 2017). There are definite treatments that can aid in sleep and improve quality of life in patients with OSA. The problem is the lack of sleep centers and the small number of qualified personnel can result in sleep disorders not being identified (Epstein et al, 2009).

Central sleep apnea (CSA) is caused by the failure of the brain to signal the chemoreceptors to breathe. Carbon dioxide will continue to rise in the blood and decrease the amount of oxygen patient is receiving. Patients with CSA have complete cessation of air flow for at least ten seconds or longer with no respiratory effort. Patients with CSA suffer from frequent awakening at night trying to gasp forair. Patients with CSA often present with moderate daytime sleepiness. Again, treatments are available for this type of sleep apnea. These types of patients

would definitely benefit from a sleep study to identify the best treatment for their condition (Kacmarek et al, 2017).

Sleep in itself is not a simple process. There are many different stages of sleep and many parts of the brain help to control sleep patterns. A polysomnography test is considered the gold standard in diagnosing sleep disorders. The results of this test help a sleep specialist to understand specific sleep patterns for each individual. These tests aid in providing the proper data that is needed to make an appropriate treatment recommendation (Kacmarek et al., 2017).

The field of sleep continues to expand due to new treatments, advanced technology and the increased public awareness about how sleep disorders can disrupt daily lives. Sleep technologists, or polysomnography technologists, are trained in sleep medicine and assist in patient care evaluation. Polysomnography technologists are credentialed by the Board of Registered Polysomnography Technologists (BRPT), the American Board of Sleep medicine (ABSM) or the National Board for Respiratory Care (NBRC) (CoARC, 2015). There are five different pathways to become eligible for the Registered Polysomnography Technologists (RPSGT) exam. Wallace Community College will host the pathway accredited by CoARC and will consist of two semesters following successful completion of a respiratory therapy degree.

As technology advances in the field of sleep, the need for highly trained individuals to accurately perform these studies will increase. Their scope of practice will broaden to include use of positive airway pressure devices, oximetry, capnography, administering oxygen, patient education, and quality assessment. The sleep specialist should review the results of objective testing with the patient, including education on the nature of the disorder and treatment available. The patient should be fully informed on the pathophysiology, risk factors, and clinical

consequences of the disease process as well as the treatment. These technologists will assist sleep specialists in physiological testing, clinical assessment, diagnosis, patient education, and the best treatment option for the patient's sleep disorder (Colten and Altevogt, 2006).

The current organizational structures at many academic health centers are not sufficient to ensure continued advances in the study of sleep. Continued clinical advances and growth of the field depends on the appropriate emphasis and organization of academic sleep programs. This will require special attention not only to diagnosis, but also to long term care that recognizes the need for chronic disease management with proper treatment. Millions of individuals suffering from sleep disorders remain undiagnosed and untreated. As this awareness increases efforts to enhance the training and education in sleep medicine at all levels of medical education continue to face important challenges. The focus must be on public education, proper training for polysomnography technologists, and quality assurance. With the upcoming retirement of the current cohort of grandfathered sleep specialists, the number of qualified technologists is expected to decrease drastically over the next several years (Colten and Altevogt, 2006). There are 2,500 sleep centers in the United States that are accredited by the American Academy of Sleep Medicine (AASM). The AASM standards for accreditation ensure that sleep medicine providers display and maintain proficiency in areas such as testing procedures and policies, patient safety and follow-up, and physician and staff training. There are an estimated twenty one thousand Registered Polysomnography Technologists (RPSGT). The credential is valid for five years and can be renewed by earning fifty continuing education credits or retaking the credentialing exam (Wells & Vaughn, 2013). There are only forty six accredited programs for Polysomnography School in the United States with only two in the state of Alabama. (The Neurodiagnostic Society, 2018) These two schools are an estimated 400 miles from Dothan.

Given the number of sleep studies performed in this geographic area monthly, a polysomnography program at Wallace Community College would be an asset to the community and to the college. This program could be started at minimum cost with a top enrollment set for 20 students each academic year.

Implementation Plan/Methodology

To evaluate whether a need existed for such a program, a questionnaire was developed and sent out to health care personnel within a 75 mile radius of Wallace Community College. A total of 35 questionnaires were sent with 28 responding to the survey, for an 80% response rate. A copy of this questionnaire can be found in Appendix A.

Table 1 demonstrates that all respondents either agree or strongly agree that an educational program for polysomnography would benefit the community and increase the professional competence of sleep technologists. Similarly, 100% either disagree or strongly disagree there are sufficient numbers of educational programs available in the geographic area serviced by WCC. The results of this survey show that health care personnel feel there is an unmet demand for highly trained sleep technologists within this field of study in the geographic area surrounding Dothan. There are a total of six sleep centers within a 75 mile radius of WCC. There are currently job openings in four of these facilities for registered polysomnography technologists.

Table 1. Survey Results

Survey Results

The need for a sleep study program for our community more specifically at Wallace Community College

	Agree	**Strongly agree**	**Neutral**	**Strongly disagree**	**Disagree**
1. There is a shortage of sleep technologists in my geographic area.	10	18			
2. Within 5 years the demand will increase for qualified sleep technologists In my geographic area.	11	17			
3. There are underserved geographic areas near me with respect to sleep Disorder assessment and treatment.	11	17			
4. Therapeutic interventions for sleep disorders will advance in the next 5 years.	11	17			
5. Testing equipment and devices will improve in the next 5 years.	11	17			
6. Community education of sleep disorders will increase in the next 5 years.	11	17			
7. There is a shortage of sleep technology educators in my area.	11	17			
8. In the next 5-10 years demand will increase for sleep technology educators in my geographic area.	11	17			
9. There are a sufficient number of educational programs available in my geographic area.				18	10
10. Sleep centers have a need for technologist with advanced training or specialization.	11	17			
11. An advanced educational degree in sleep technology will aid in the ability to provide patient education.	11	17			
12. An advanced educational degree in sleep technology will increase in professional competence.	11	17			

Outcomes/Summary of the Project

As a result of the identified need for a polysomnography technologist program at WCC, implementation of this short certificate will be based on a two semester program. This program would be accredited by CoARC. CoARC defines a sleep disorder specialist program as a certificate program offered concomitantly with the Respiratory Care base program which will prepare respiratory therapy graduates with the additional competencies of polysomnography practice as performed by sleep disorder specialists (CoARC, 2015). Once this is completed the graduates will be eligible for the Board of Registered Polysomnographic Technologist (RPSGT) credentialing exam or the National Board for Respiratory Care (NBRC) sleep disorders specialist (SDS) exam (CoARC, 2015).

Students will learn the basics of performing the typical operational tasks as a sleep technician as well as adult and pediatric sleep studies performed within a hospital based or free-standing sleep disorder center. Upon completion of this program, students will be able to understand the role and scope of the sleep technician within a sleep center, educate the patient on basic elements of sleep related disorder, perform basics of patient hookups, perform diagnostic sleep studies, perform therapeutic sleep studies with the use of positive airway devices such as Continuous Positive Airway Pressure, Bi-level Positive Airway Pressure, perform daytime hypersomnia studies such as Multiple Sleep Latency Tests (MSLT) and Maintenance of Wakefulness Tests (MWT) (CoARC, 2015).

The primary instructor for this portion of the program must have a minimum of an associate degree in applied science with either the Registered Polysomnography Technologist (RPSGT) credential or Certified Respiratory Therapist/Registered Respiratory Therapist – Sleep

Disorder Specialist (CRT/RRT-SDS) credential. The faculty member must have at least three years of clinical experience in sleep technology and at least one year of experience in an instructor position. Implementation of this short certificate must be monitored closely with all benchmarks and personnel requirements met based on CoARC recommendations (CoARC, 2015).

The mission statement will focus on the quality of medical care in terms of diagnostic and therapeutic procedures in polysomnography. The main focal point will be the satisfaction of students and to providing a high quality of comprehensive cognitive and psychomotor skills. This program will provide structured and up to date training for technicians in the field of sleep medicine. Another focal point will be to increase the awareness of the public about sleep disorders and its dangers to everyday health. This could easily be tied to the government initiative for healthy people 2020. If sleep disorders can be diagnosed and treated, many other health hazards could be controlled or eliminated.

Curriculum

The students that enter a short certificate program will have an Associate in Applied Science for Respiratory Therapy degree. These students will be ready to go to work at the end of this degree. If they choose to continue to continue their education, the best method of teaching these students will be a hybrid approach since many students will be entering the workforce. This would increase accessibility to students who have previously completed their Respiratory Therapy degree. This hybrid class will combine the best attributes of both face-to-face and online formats to make this program a success. The 2010 U.S. Department of Education meta-analysis suggests that hybrid courses result in superior student learning outcomes. Studies show

improved achievement for students in hybrid classes relative to those taking traditional classes (Hall & Villareal, 2015). However, achievement is connected towards student motivation, experiences and time management skills. These factors play a part in how well students will perform in this type of teaching format. The course content will be presented in online environments through lectures using PowerPoint and Prezi presentations. Discussion boards will be used to build the social presence as students exchange ideas and opinions. The organization of online materials and instructional activities combined with face to face classes provide students with the convenience to fully plan for full participation in the classroom (Hall & Villareal, 2015). The success of any class depends on identifying clear learning goals which have been implemented in each course syllabi.

The curriculum outline for this start up program is a short certificate. A total of twenty eight hours minimum must be completed in this field of study. The curriculum will ensure the achievement of program goals and learning domains. A list of courses that must be fulfilled to complete this program can be found in Appendix B. The instruction is in an appropriate sequence of classroom, laboratory and clinical activities. The on-campus requirements of this program are as follows:

Class-Students are required to come to campus for all major exams in each course. There will be a total of three exams per course. For polysomnography technology I which is course number 314 and polysomnography technology II for course number 316 these two will be presented as a skills check off practical and a score of 80% or better must be achieved.

Lab-students are required to come to campus for approximately one to two weeks Monday through Friday at the beginning of each semester for lab training. Times, days and dates will vary each semester.

Clinical-Students are required to attend clinical rotations in PSG 315 & 316. These rotations will be held at different affiliates with the majority of the clinical hours scheduled for night shifts. Each rotation is a full 12 hour shift. The student will be required to attend two shifts per week. This is mandatory requirement set by CoARC.

Instruction will be based on clearly written course syllabi describing learning goals, course objectives and competencies required to be successful in each course as well as the program. This content will be periodically reviewed and revised to reflect both up to date standards of care set in the workplace based on the requirements by the Board of Registered Polysomnography Technologists. The material presented will be periodically reviewed and revised to cover the BRPT examination matrix, which are nationally accepted standards of roles and functions in polysomnography (CoARC, 2015).

Program Costs

Cost is one of the main factors that should be monitored throughout this process. For this program to be a success, costs must stay at a minimum. A hybrid course would be most cost effective method of delivery for this program. This type of teaching offers the best of both worlds by combining face to face and online formats into the course delivery. This method is both flexible for students and very accessible. Fortunately, the Polysomnography and Respiratory program will share a lab. This will help keep startup costs down. The lab space is

well equipped with four hospital beds with mannequins. Each bed mimics a hospital room with its own head wall consisting of oxygen and compressed air. The equipment needed would be kept to a minimum, as the lab would only require a basic set up. All other techniques would be learned during clinical rotations. The sleep lab on campus must provide the following diagnostic tools to teach required skills to the students:

- Polysomnography diagnostic sleep system.
- Pulse oximeters (already available)
- Capnograph for measuring exhaled carbon dioxide (already available)
- EEG monitor to record brain waves
- EMG monitor to record muscle activity
- EOG monitor to record eye movement
- Respiratory Effort Belt
- Airflow thermistor

In addition to diagnostic tools, the following therapeutic tools are also required. Since the Respiratory Therapy program already has these items, they will not need to be purchased and therefore will assist with keeping startup costs at a minimum.

- BIPAP
- CPAP
- V60
- 02 supplies
- Masks

- Nasal pillows

The following is a list of equipment that will need to be purchased for the lab for the Polysomnography program. The prices reflect an unofficial quote from Phillips Respironics for the sole purpose of this project. Official quotes would be done in the future once this program has been approved by the curriculum committee and received a provisional accreditation by CoARC (CoARC, 2015).

Table 2 Projected Equipment Cost

Projected Equipment Cost		
Equipment	**Quantity**	**Cost**
Diagnostic sleep system complete with signal pathway and computer interface	1	$28,000.00
EEG/EMG/EOG electrodes for set up for recording	1	$1,800.00
Respiratory effort belt	2	$1,340.00
Airflow thermistor	1	$975.00
		Total Equipment costs: $32,115.00

The instructor's salary will be based on experience. This instructor would be the key personnel per CoARC requirements. There must be a faculty member designated as the primary

instructor for this course. The instructor would be responsible for all courses at the start of the program. An adjunct will be hired for lab assistance only. The starting salary would be $36,000.00 to $52,000.00 for a twelve month contract. This figure is based off of the Alabama Community and Technical College's schedule. Costs will be kept to a minimum on this short certificate program. The total cost of equipment is estimated at $32,115.00. This is one of the main factors why this program would be a success. The total startup cost would be approximately $68,115.00 to $84,115.00. This includes both equipment remaining to be purchased and estimated salary for employees. The administrative staff will be provided by the allied health department and shared between each department. This will consist of a secretary, division director, and associate dean as dictated per CoARC requirements (CoARC, 2015). Equipment is usually the largest factor in the startup of any program. However, with a short certificate program this can be done much cheaper as the two programs would share lab space and equipment. The student would be required to come to campus at the beginning of each semester for lab training. The clinical requirement offers a variety of health care settings where students perform clinical procedures under the supervision of polysomnography technologists.

Conclusion

Sleep is a very important factor in maintaining good quality of health. Every health care provider should have knowledge of the basics of sleep health. They should be aware of sleep disorders and the complications that may exist from lack of sleep. Insufficient sleep has become so common in the United States that the Centers for Disease Control and prevention now consider it an epidemic (Wells & Vaughn, 2013). Countless studies continue to connect sleep disorders with many severe health consequences.

Currently, there are treatments for most sleep problems. However, first individuals must realize that a problem exists. Graduates of this proposed program will be successful in determining what is needed for patients who struggle with any form of sleep disorder. They will be experienced in the treatment of the sleep disorder and capable of implementing such treatment as deemed necessary. With the inadequate availability of sleep centers and sleep technicians not only in the United States but worldwide, access to portable diagnostic screening procedures and streamlining initiation of treatment would be an advantage (Colten & Altevogt, 2006). An estimated 80% to 90% of obstructive sleep apnea cases remain undiagnosed and infrequently detected. According to the government initiative of Healthy people 2020, their main goal is to increase the public knowledge of how adequate sleep and treatment of sleep disorders improve health, productivity, wellness, quality of life, and safety on roads and in the workplace. Health education and promotion programs can increase awareness of common sleep disorders, such as insomnia, restless leg syndrome, and sleep disorder breathing. Sleep affects and is affected by every organ system of the body. Every health care provider should have knowledge of the basics of sleep health, awareness of sleep disorders, and complications from lack of treatment (Des Jardins, 2016). A specialist in this field of study will determine what type of information is suitable for the patient and what type of changes the patient will need to make in everyday life to improve his or her sleep. Treatment of sleep disorders, even if only behavioral and educational in general, has the potential to increase an individual's wellbeing and productivity. This program will satisfy a clearly documented workforce need in this geographic area. This short certificate program will benefit this local service area. The program should be cost effective due to such a low startup cost.

This plan is a definite challenge but will benefit the Respiratory program, students and community if approved. The program will implement effective strategies needed to result in student success and satisfaction. Program success will be measured through outcome assessments based on the national credentialing examinations performance, programmatic retention/attrition, graduate satisfaction, employer satisfaction, and positive job placement along with any programmatic summative measures. This program must meet all thresholds set by CoARC to gain approval as an accredited program in Polysomnography Technology (CoARC, 2015).

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Appendix A

Questionnaire

The need for a sleep study program for our community more specifically at Wallace Community College

	Agree	Strongly agree	Neutral	Strongly disagree	Disagree
1. There is a shortage of sleep technologists in my geographic area.					
2. Within 5 years the demand will increase for qualified sleep technologists In my geographic area.					
3. There are underserved geographic areas near me with respect to sleep Disorder assessment and treatment.					
4. Therapeutic interventions for sleep disorders will advance in the next 5 years.					
5. Testing equipment and devices will improve in the next 5 years.					
6. Community education of sleep disorders will increase in the next 5 years.					
7. There is a shortage of sleep technology educators in my area.					
8. In the next 5-10 years demand will increase for sleep technology educators in my geographic area.					
9. There are a sufficient number of educational programs available in my geographic area.					
10. Sleep centers have a need for technologist with advanced training or specialization.					
11. An advanced educational degree in sleep technology will aid in the ability to provide patient education.					
12. An advanced educational degree in sleep technology will increase in professional competence.					

This completes the survey. Please scan the completed survey and signed inform consent and return both documents to me at Judith.harrell@washburn.edu.

Thank you for your assistance with this project.

Appendix B

Course Descriptions

PSG 310 Introduction to Polysomnography. 3 hours.

This course will provide a basic introduction to this health field of polysomnography. This will include medical terminology, specific job duties, and roles of the sleep technologist, patient confidentiality, infection control, proper documentation, and professional behavior. This course will focus on the standards of practice of clinical polysomnography. Proper technique, instrumentation, and how to record and monitor techniques utilized for a polysomnography study. The student will have a basic understanding of the polysomnography field of practice once this course is complete.

PSG 311 Polysomnography Technology. 4 hours.

This course includes both didactic and laboratory training in polysomnography technology for entry level students. This will be instrumental in the proper use of diagnostic instruments necessary for quality polysomnography assessment. The student will be taught in the proper set up of instrumentation and calibration, recording and monitoring techniques, scoring the actual study, basic electrical concepts as well as all technical aspect of this study. Once this course is completed the student will have a complete understanding of the types of diagnostic instrument for quality sleep studies assessment.

PSG 312 Polysomnography Technology. 3 hours.

This course will provide the necessary training in more advanced technology of polysomnography. This course will cover all the aspects of sleep scoring and event recognition along with therapeutic interventions as well as patient-technologist interactions related to polysomnography technology. These interventions will include the use of Bi level positive airway pressure and Continuous positive airway pressure machines for different types of sleep apnea or disorders.

PSG 313 Polysomnography Technology. 5 hours.

This course will include a complete overview of anatomy and physiology which will include respiratory function, cardiac function, and neurologic function of the human body. This course will discuss in great detail the etiology and treatment of sleep studies and related disorders. Upon completion the student will be able to understand the basic function as it relates to sleep study and sleep disorders presented on a daily basis.

PSG 314 Polysomnography Technology 3 hours

This course provides an introduction to the diagnostic events of the sleep/wake disorders. It also provides a more in-depth look at the guidelines for each polysomnography procedures. This course will cover positive airway pressure (PAP) titration by following the proper guidelines, oxygen administration protocol, multiple sleep latency test (MSLT) and maintenance of Wakefulness (MWT). This course will also provide the proper guidelines for hypersomnias, insomnia and parasomnias. This course will provide the proper pharmacological interventions available to treat different sleep disorders. Upon completion, the student will be able to

recognize the manifestations of sleep disorders and classify the appropriate treatment for each disorder.

PSG 315 Polysomnography Technology. 5 hours.

This course provides clinical rotations in the basics of polysomnography technology. These rotations will help in the instrumentation setup and calibration, recording and monitoring techniques, along with patient technologist interactions. This course of study will provide patient contact in a sleep lab. This will aid the student to observe, perform with supervision and evaluate actual sleep studies. The student must perform clinical rotations at different affiliates of the program. The clinical rotation will be a 12 hour shift in which two shifts must be completed each week during this course.

PSG 316 Polysomnography Technology. 5 hours

Throughout this course, students will participate in clinical practice in an affiliated health care facility and or sleep center. Our clinical instructor or preceptor will be with the students during each rotation. Students will be required to attend clinical rotations weekly. The majority of these hours will be scheduled for night shift. The student must attend two shifts per week as scheduled. The student will be active in recording techniques and test scoring of patients. Upon completion, the student will be able to successfully prepare and admit the patient to the sleep lab. The student should be competent in monitoring the patient during sleep study and patient education once the patient is ready for discharge.

Appendix C

IRB Application

Institutional Review Board (IRB)

Application for Project Approval (revised August 2017)

PLEASE COMPLETE THIS FORM IN ITS ENTIRETY

NOTE: This is a Microsoft Word form document. Please open and save the completed document using Microsoft Word. Click on Text Boxes ( ) and begin typing to provide written information.

Investigator Information

1. Name of Principal Investigator: Judith L. Harrell
   a. Email address of Principal Investigator: Jharrell@washburn.edu
2. Name(s) of Additional Investigator(s): N/A
   a. Email address(es) of Additional Investigator(s):
3. For student projects, name(s) of Supervising Faculty Member(s): Zach Frank
   a. Email address(es) of Supervising Faculty Member(s): zach.frank@Washburn.edu
   b. Campus Phone Number(s) of Supervising Faculty Member(s): 785-670-1406
   c. Departmental Affiliation and Location: Associate Professor/Master of Health Care Education Program.

IRB Certification

4. Have **ALL** of the individuals listed in items 1 – 3 above completed **and** passed all six (6) IRB Training Modules?
   ☒ Yes
   ☐ No. If "No," then do **not** submit this IRB application. IRB applications must be submitted only after all of the individuals listed in items 1 – 3 above have completed and passed all six (6) IRB Training Modules.

Project Narrative

5. Is this project a Quality Assurance Initiative?
   ☐ Yes

X No

6. Which of the following groups will you be **intentionally recruiting** in your study? Check ALL that apply.
   ☐ Children (individuals under the age of 18)

   ☐ Prisoners

   ☐ Individuals with developmental disabilities

   ☐ Pregnant women, fetuses, and/or neonates

   ☐ Potentially at-risk individuals, such as undocumented immigrants or LGBTQ individuals

   X None of the above will be used in the proposed study

7. Will you be asking participants questions or exposing them to stimuli about sensitive topics that could have more than minimal risk of emotional harm? Sensitive topics might include mental health, child abuse, sexual/domestic violence, or other topics that may be considered "triggers."
   ☐ Yes

   X No

8. Does this research entail more than "minimal risk" (the risk of harm anticipated in the proposed research is not greater, considering probability and magnitude, than that ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests)?
   ☐ Yes

   X No

9. Title of Project: Polysomnography Program within the Wallace Community College Respiratory Therapy Program

10. Funding Agency (if applicable):

11. In 2-4 paragraphs, describe the project's purpose(s) and benefit(s). Discuss the importance of conducting the proposed study. In particular, explain why the proposed study should be conducted (purpose) and what will be gained from conducting this study (benefit).

    The purpose of this study is to identify a need for a Polysomnography program at in Dothan, AL. Polysomnography technologists assist in the clinical assessment,

physiological monitoring and testing as well as diagnosis, management and prevention of sleep related disorders by using a variety of diagnostic and therapeutic tools.

This specialty provides care to patients of all ages. The incidence of sleep disorders continues to increase as is awareness of the many different types of disorders and their treatments. Sleep labs across the United States continue to grow with this increased demand. This supports the need for the demand of trained professionals in this field of study. Labor and Statistics reports the mean average salary as of 2017 was $53,000.00.

This study will gather the opinions of surrounding medical personnel about the need for these services in the area surrounding Dothan, Alabama.

12. Describe the proposed subjects:
    a. Number – 30-35
    b. Age – 25 and over
    c. Sex – All genders
    d. Race – All
    e. Other characteristics –

13. Describe how subjects are to be selected/recruited. All recruitment material (i.e. email text, social media text, posters, etc.) must be submitted with this application. The subjects are recruited based solely on being a member of the health services within our area up to a radius of 75 miles.

14. Describe the proposed procedure in the project. Any proposed experimental activities that are included in evaluation, research, development, demonstration, instruction, study, treatments, debriefing, questionnaires, and similar projects must be described. ***Use simple language; avoid jargon.***

    A questionnaire will be used in this experiment based on their own subjective data of the need for Polysomnography program to be taught at Wallace Community College. This questionnaire will be emailed within a radius of 75 miles. Once the questionnaire is completed and returned to my attention, I will print off the attached survey and delete the email that contained the attachment. In doing this, all names related to this survey will be removed and no identifiable information will be present on the returned surveys.

15. Have you included with your IRB application ***all*** questionnaires, tests, recruitment material, or related research instruments that are to be used?
    X Yes
    ☐ No
    ☐ Not applicable

16. If you are conducting your study at a site outside of Washburn University, a letter of approval written on the agency letterhead or an email (from the agency's official email address) from the authorized individual ***must*** accompany the proposal. The letter/email should make it clear that the person is aware of the topic, task, and procedures of the study. The letter/email should also include the title/position of the authorizing individual. Have you included letter/email of approval from the outside agency/institution?
    - ☐ Yes
    - ☐ No
    - X☐ Not applicable

17. The data will be analyzed in:
    - ☐ Individual form
    - **X** Aggregate form
    - ☐ Both individual and aggregate form

18. ***Please read completely*:** You must include a copy of the informed consent statement you plan on having participants read and sign. If participants are under 18 years of age, a consent form ***must*** be created for parental signature. If information other than that provided on the informed consent form is provided, attach a copy of such information. In the consent form, explain how the identifying information will be either anonymous (meaning the principal investigator *cannot* tie participants to their data) or confidential (meaning the principal investigator *can* tie participants to their data). The consent statement *cannot* include exculpatory (absolving from fault) language through which the subject is made to waive, or appear to waive, any legal rights, or to release the institutions or agent from liability for negligence.
    Have you attached a copy of the informed consent statement?
    - **X** Yes
    - ☐ No
    - ☐ Not applicable

19. What steps have you taken to ensure that individual names or personally identifying information will not be associated with the data you will collect?
    Once information is received by me. I will delete all names associated on the survey report.

20. Will electrical or mechanical devices be applied to subjects?
    - ☐ Yes – If "Yes," use the text box that follows to provide a detailed description of the steps that will be taken to safeguard the rights, safety, and welfare of subjects.

X No

21. Participants in the proposed study will be:
    - ☐ Audio recorded
    - ☐ Video recorded
    - ☐ Both audio and video recorded
    - **X** None of the above are applicable to the proposed study

***IMPORTANT*:** If you audio and/or video record participants, your consent form must contain a statement stating that participants will be recorded. The consent form should contain detailed information about how the recordings will be stored in a secure location and what exactly will be done with the recordings. Also, there must be two (2) signatures line on the consent form: (1) where the participant agrees or does not agree to being recorded and (2) where the participant agrees to participate in the study.

I agree to conduct this project in accordance with Washburn University's policies and requirements involving research.

Name(s) Principal | *Judith L. Harrell* | *of*

Investigator(s) (type your full name above)

TO BE COMPLETED BY FACULTY SUPERVISING STUDENT RESEARCH:

22. "I have reviewed this IRB application and deem it acceptable for IRB review."
    - ☒ Yes
    - ☐ No
    - ☐ Not a student project.

Sample Email

Polysomnography technologists assist in the clinical assessment, physiological monitoring and testing as well as diagnosis, management and prevention of sleep related disorders by using a variety of diagnostic and therapeutic tools. This specialty provides care to patients of all ages. The incidence of sleep disorders continues to increase as is awareness of the many different types of disorders and their treatments. Sleep labs across the United States continue to grow with this increased demand. This supports the need for the demand of trained professionals in this field of study. Labor and Statistics reports the mean average salary as of 2017 was $53,000.00.

In light of the expected growth in this health care area, we are conducting a survey of local respiratory therapists to determine if there is a specific market need for a training program for polysomnography technologists in the Dothan, Alabama area. Your participation is solicited, but strictly voluntary. Do not hesitate to ask any questions about the study. Be assured that your name will not be associated in any way with the research findings. We appreciate your cooperation very much. Your participation is greatly appreciated.

If you are willing to participate, please print and read the attached informed consent statement. If you wish to continue with your participation in the survey, please sign the form. Then print the attached survey. After completing the survey, please scan the signed informed consent and the completed survey and email them back to me.

*This study has been approved by the Washburn University Institutional Review Board, IRB#_____

Thank you,

Judy Harrell

IRB Approval

From: irb
Sent: Tuesday, November 6, 2018 8:16 PM
To: Judith Harrell; Zach Frank
Subject: IRB application 18-74

Good evening,

Your IRB application entitled, "Evaluating a need for Polysomnography Program in Dothan, AL" (18-74), has been approved. You are welcome to begin collecting data as soon as you would like. Good luck with your study!

Dr. Mike Russell
IRB Chair