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Nurse's Perceptions of Visitor's Adherence to Transmission-Based Precautions

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Abstract

Transmissions based precautions are measures implemented in various clinical health care settings as a means to prevent the transmission of infectious diseases and decrease instances of healthcare acquired infections (HAI). HAI's result in increased cost to hospitals, longer hospitalization for patients, increased patient suffering, and fatal patient outcomes. While staff member adherence to transmissions based precautions are mandated through various organizations and hospital policies, a review of literature indicates little research has been conducted regarding visitor compliance with transmission-based precautions. The potential implications in healthcare from visitor non-adherence acquired infections are unknown; revealing a gap in literature and supporting the need for further research to describe the phenomenon. Through utilization of a descriptive online survey instrument, the purpose of this descriptive study is to gain insight into why nurses believe visitors may or may not be compliant with transmission-based precautions. To collect the data, an online descriptive survey instrument was developed and distributed via email to all graduate students' enrolled East Tennessee State University's College of Nursing. Only ten participants met the eligibility requirements to participate in this study. Data was analyzed though a predictive analytics software and grouping responses into themes. Responses suggest that nurses feel visitors are not complying with transmission-based precautions because of a lack in education, not perceiving the infection as a threat, prior exposure to loved one at home, and inconvenience.

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Background

Healthcare acquired infections (HAI) are infections which were not present in a patient at the time of hospital admission. A HAI is a result of a patient being exposed to a given organism during their hospital stay. HAI's have many repercussions which include increased patient discomfort, increased length of hospitalization, and increased patient mortality rates (Centers for Disease Control and Prevention [CDC], 2014). Additionally, HAI's have significant financial ramifications and substantial increase in hospitalization cost (Scott, 2009).

According to the Centers for Disease Control (CDC, 2014), on any given day it is estimated that about 1 in 25 patients have at least one HAI. In 2011, it was estimated that approximately 722,000 HAI's had occurred within United States acute care hospitals (Centers for Disease Control and Prevention [CDC], 2014). In 2011, it was estimated that 157,500 HAI's resulted in pneumonia, 123,100 HAI's resulted in gastrointestinal illness, 93,300 HAI's resulted in urinary tract infections, 71,900 HAI's resulted in bloodstream infections, 157,500 HAI's resulted in surgical site infections from inpatient surgery, and roughly 118,500 HAI's resulted in other various types of infections (Centers for Disease Control and Prevention [CDC], 2014). Furthermore, it is estimated that in 2011, 75,000 patients with a HAI died during the time of their hospitalization (Centers for Disease Control and Prevention [CDC], 2014).

The financial burden of a patient acquiring a HAI's weighs heavily on the hospital facility. As Medicare, Medicaid, and insurance companies will not pay for HAI's, the hospital is responsible for the cost of extended care. In 2007, it was estimated that the financial implication of HAI's cost United States inpatient hospitals anywhere from \$35.7 billion to \$45 billion annually (Scott, 2009).

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Transmission-based precautions are used as a barrier within a health care setting to break the chain of infection and decrease the instance of HAI's among patients. The chain of infection involves an infectious agent, reservoir, portal of exit, mode of transmission, portal of entry, and a host (Potter & Perry, 2013). If one link of the chain is broken, the infection cannot continue and therefore the spread of infection becomes halted. Transmission-based precautions are used to break the chain of infection at the mode of transmission and portal of entry by using personal protective equipment (PPE) to act as a barrier. Transmissions based precautions are divided into the following categories: contact, droplet, and airborne (Potter & Perry, 2013).

Contact precautions are used in direct and/or indirect contact with patients and the environment around them. Contact precautions require the use of a gown and gloves as PPE when in close contact with an infected patient or a patient suspected of infection. This type of transmissions based precaution works to break the chain of infection through reducing instances of contact with contaminated bodily fluid or organisms lying on the skin. Patients placed under contact precautions may be infected with colonization or infection of multi-resistant organisms such as Vancomycin-resistant enterococcus (VRE), Methicillin-resistant *Staphylococcus aureus* (MRSA), *Clostridium difficile*, *Shigella*, or many other wound infections such as Herpes Simplex and scabies. Not only does adherence to contact precautions halt the spread of infection among patients, it provides protection to health care staff as well (Potter & Perry, 2013).

Droplet precautions are used to prevent diseases that are transmitted through large particles that can be expelled into the environment and travel 3-6 feet from the point of expulsion (Potter & Perry, 2013). Droplet precautions require the use of a surgical face mask with a face shield as PPE when with dealing contaminated patients. Patients placed under droplet precautions may be infected with Influenza, Adenovirus, Respiratory Syncytial Virus, Human

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Metapneumovirus, and Bordetella pertussis (Centers for Disease Control and Prevention [CDC], 2011).

Airborne precautions are used to prevent the transmission of diseases spread by smaller droplets which express the ability to remain in the air for a longer period of time. These particles also have the unique ability to attach themselves to dust particles. The PPE required for patients placed under airborne precautions is the use of an N95 respirator mask, which filters out the tiny particles from the inhaled air. Patients placed under airborne precautions may be infected with measles, chickenpox, or pulmonary/laryngeal tuberculosis. The PPE used for this mode of transmission is aimed at breaking the chain of infection by decreasing instances of inhaled particles (Potter & Perry, 2013).

All staff is required to adhere to transmission-based precautions per facility protocol and Occupational Safety and Health Administration (OSHA) regulations. OSHA requires employers provide adequate PPE for each employer as to not place employees at potential risk (United States Department of Labor, n.d.). This effort may increase compliance among staff members through enforcing compliance from not only the employer, but also OSHA.

Compliance to transmissions based precautions is mandated through the individual health care organization and OSHA, which may help increase adherence among employees. It is accepted that by implementing transmission-based precautions among staff, hospital-acquired-infections will be decreased among patients though breaking the chain of infection. However, the question remains regarding whether other individuals, such as visitors, break the chain of infection through adherence to transmission-based precautions.

Literature review

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In the literature review conducted there was only one article found which discussed visitor regulations for patients placed under transmissions based precautions. The study performed by Poster and Bentz (1987) surveyed southern Californian hospitals regarding visitation policies and rationales for restricting peers. The survey results revealed that the most frequent rationale given for restriction of peer visitors was to decrease infections and inhibit the spread of communicable diseases. This was the only article noted where an action was discussed to prevent the transmission of communicable diseases among visitors.

Many studies were noted to address precaution adherence by health care workers such as the study performed by Caglar, Yildiz, and Savaser (2010), which attempted to study the compliance of health care workers with hand hygiene. In this study, the researchers observed both nurse and physician hand hygiene compliance in a neonatal intensive care unit (NICU). Data was collected from a total of 344 situations which required hand washing, such as entering the facility and direct patient care. The staff was recorded based on direct observation of their compliance to the hand hygiene scenarios. The results concluded that nurses more frequently adhered to hand washing than physicians. Of the situations requiring hand washing, only 13.33% of the nurses and 23.75% of physicians who washed their hands utilized proper technique and appropriate length of time.

Many studies performed by government agencies attempt to gather and publish relevant data for national and state infection rates. In the CDC's Healthcare Associated Infections Progress, the public is provided with information to track a specific indicator and ensure timely reporting of data. In Tennessee, 16% of hospitals have catheter-associated urinary tract infections (CAUTIs) above the national standardized infection ratio (SIR). The rate of colon surgery surgical site infections (SSI) in Tennessee hospitals ranks 10% above the national average.

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Central line-associated bloodstream infections (CLABSIs) are significant problems in the acutely ill, and 11% of hospitals in Tennessee have a rank higher than the national average SIR. Finally, 5% of hospitals have an abdominal hysterectomy SSI demonstrating a rate higher than the national average SIR (CDC, 2014).

A major gap in the literature was noted in the topic of visitor compliance to transmission-based precautions. Most literature reviewed dealt with decreasing infections by means of hospital staff compliance. Many other topics included research related to invasive lines such as urinary catheter acquired infections or infections from a central venous line. It is unknown if visitors are complying with transmissions based precautions or what the implications of their possible noncompliance are. The battle against transmission-based precautions is still relevant as noted on the statistics specifically for Tennessee. Although measures are in place to prevent staff from spreading communicable diseases and decreasing HAI's, this may only be partially helping since visitor compliance has not been evaluated. This creates a possibility of continuing unnecessary HAI's, increasing patient stays, and creating greater costs to health care facilities. Moreover, it is imperative that all options to combat HAI's be explored.

Purpose

Through this study the researcher has attempted to gain insight into nurse's perceptions of visitor compliance with transmission-based precautions. By using a descriptive survey instrument the researcher has attempted to answer the question "why do nurses feel visitors are not complying with transmissions based precautions?"

Definitions

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The independent variable of this study is that nurses will always care for patients placed in transmission-based precautions within a hospital setting. The dependant variable will be whether or not the visitors adhere to the transmission-based precautions.

Research Method

Design

The researcher has utilized a descriptive survey to better understand the phenomenon of visitor non-compliance to transmission-based precautions from the nurse's perspective. An online survey was distributed via email to graduate nursing students at East Tennessee State University. The survey responses have been recorded online anonymously.

Population and Sample

Included in this population and sample are all Registered Nurses (RN) who voluntarily take the online survey that was distributed via email by Dr. Kathleen Rayman to the graduate nursing students of East Tennessee State University. Excluded from the population and sample are all graduate students who are not classified as a Registered Nurse, those not currently employed as a Registered Nurse, and those who did not wish to take part in the survey.

Study Site

The site of the study was performed at East Tennessee State University (ETSU). Permission was obtained from the director of graduate programs in the College of Nursing. The survey was distributed via email and the respondents completed the anonymous survey online in the setting of their choice. A question was included in the survey to determine which clinical unit each respondent is currently employed with.

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Instruments

The researcher developed a descriptive questionnaire for data collection. The survey was developed by the researcher due to inability to locate an adaptable previously-designed survey instrument. The survey was constructed to meet the specific needs of this study and to accurately answer the research question. The survey includes four open ended questions, two "yes or no" questions, two percentage-based questions, and four additional "yes or no" questions with an option to explain.

Data collection

The survey was anonymously distributed via email to all students enrolled in the East Tennessee State University's graduate nursing program. The researcher selected to have all responses anonymously recorded. Additionally, the participants of the study completed the survey in the setting of their choosing. The survey was distributed one time by the director of the nursing graduate studies department via email, and remained open for one week's time to collect responses. All survey responses were recorded online by a secure website maintained by the College of Nursing statistician. Respondents were given the option to skip any question they did not wish to answer and to suspend completion of the survey at any time. Twenty-nine individuals accessed the survey, but of those twenty-nine individuals only eighteen gave consent to participate. The researcher obtained seventeen responses, and of those responses, ten participants were eligible to complete the study based on the qualifying questions.

Data Analysis

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After the data was collected, the researcher grouped responses into categories where the responses were closely related, looking at the frequency of words to denote the similarity of responses. Additionally, the "yes or no" questions were analyzed with SPSS predictive analytics software.

Findings

Due to a gap identified in the literature and this study being the first of its kind, it cannot be determined if the results of this study are similar to any previous studies.

Summarization of findings

When asked to estimate how many hours per week each survey participant works 10% selected 0-10 hours, 30% selected 10-20 hours, 10% selected 20-30 hours and 50% selected 30-40 hours per week. When asked which clinical unit each participant is currently employed as a Registered Nurse, three participants selected a Medical-Surgical unit, two participants selected the preoperative area, two participants selected ICU Step-down, one participant selected Labor and Delivery, one selected the Emergency Department, and one participant selected "other" and wrote in "SNF" indicating a skilled nursing facility.

When asked to estimate how many patients per shift are in some form of transmission-based precautions, 70% of participants selected <25% and 30% of participants selected 25-50%. When asked to average how many visitors adhere to transmission-based precautions each shift, 70% of participants selected <25%, 10% of participant selected 25-50%, 20% of participants selected 50-75%. Participants were then asked to indicate which methods their facility utilizes to

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alert transmission-based precautions are in place; 90% of participants selected signs and 10% of participants selected "other" and wrote in signs and verbal notification.

Next, participants were asked if they believe visitors are compliant with transmission-based precautions; 30% of participants selected "yes" and 70% of participants selected "no." If participants selected "no", they were asked to further explain their answers via an open text box. Participants expressed that visitors view transmission-based precautions as unnecessary due to being exposed to their family members prior to admission. Additionally, participants expressed that visitors would rather take their chances even following verbal or sign notification.

The following question was regarding whether or not the nurses provided education to every visitor about the importance of adhering to transmission-based precautions; 60% of participants stated "yes", indicating they do provide education to every visitor and 40% participants selected "no", indicating they do not. If participants stated that they did provide education to every visitor, the following question provided an open text box for participants to explain which methods they utilize. Participants stated that they utilized a variety of methods to educate visitors which mostly included verbal and written notification via signs or pamphlets.

In the next question, participants were asked if they felt they had adequate time to provide transmission-based precaution education to visitors during their shift. The respondents were equally divided with 50% selecting "yes" and 50% selecting "no." Following this question, respondents were given an open text box where they were asked to further explain if they selected "no" to the prior question. Respondents provided a variety of answers ranging from issues with acuity and number of patients, to proximity of patients from one another, as well as time constraints placed on patient care.

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The subsequent question assessed the participant's perception of whether or not their facility provided adequate education material for visitors regarding transmission-based precautions. In response to this question, the respondents were equally divided where 50% selected "yes" and 50% selected "no."

Next, participants were asked if they believe visitors are receptive to education on the importance of following transmission-based precautions. Not all participants elected to answer this question; of the five participants who elected to give a response 20% selected "yes" and 80% selected "no." Respondents were then asked, via open text box, to elaborate if they responded "no" to the previous question. The responses to this question indicated a lack of education on the visitor's behalf regarding transmission-based precautions, as well as visitors finding the PPI inconvenient.

The final question of the survey asked respondents to explain what changes they believe could be implemented to increase visitor adherence with transmission-based precautions. Of the four participants who elected to respond to this question, the major response was increasing visitor and community education.

Discussion

The purpose of this study was to gain an understanding of nurse's perceptions of visitor's adherence to transmissions based precautions. This question was explored through the use of a descriptive survey instrument.

Responses from the participants of this survey suggest that nurses believe visitors are not adhering to transmission-based precautions. This is denoted in the question regarding an

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estimation of how many visitors per shift adhere to transmission-based precautions where 70% of participants selected that visitors adhere to transmission-based precautions less than 25 percent of the time.

On average, how many visitors per shift would you estimate adhere to transmission-based precautions (please check one of the following)?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid <25%	7	70.0	70.0	70.0
25-50%	1	10.0	10.0	80.0
50-75%	2	20.0	20.0	100.0
Total	10	100.0	100.0	

This response is reiterated in the following question of whether or not participants believe that visitors adhere to transmission-based precautions, to which 70% of participants indicated they do not. In the following question, an open box allowing respondents to indicate why they do not believe visitors adhere to transmission-based precautions reveals the initial presence of themes.

Research Question	Salient Theme	Quote
If you answered "No" to the previous question which asked if you believe that visitors are compliant with transmission-based precautions, please explain why	Threat not perceived	"Despite warning signs, precaution signs, isolation materials, and verbal warnings from the staff, most still would rather take their chances than comply with hospital protocols."
	Prior exposures warrant transmission-based precautions unnecessary	"Family believes that the protection is for them instead of for the patients in the hospital. They most common response is, 'I have already been exposed...I won't get sick'"

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	Prior exposures warrant transmission-based precautions unnecessary	"...family members do not put on PPE nor do they even wash their hands. Even after you describe to them the reason and need they still don't follow instructions. I believe that is because they do not see the need since it is their loved one that they have been around at home."
	Lack of education	"Visitors either do not know they need to or flat out refuse to wear PPI"

Participants were asked multiple questions to assess their ability to provide education to visitors about adhering to transmission-based precautions. The responses were surprising in that they were very close in the amount of respondents who said "yes" and the amount who said "no." When asked if they provide education to every visitor on the importance of adhering to transmission-based precautions, 60% of nurses indicated that they did and 40% of nurses indicated that they do not. They further elaborated in the following question by stating that they frequently utilize verbal notification to do so. This is definitely an area of concern and could play a major factor in the lack of education seen in the theme above.

When asked if they feel their facility provides adequate education materials for visitors regarding transmission-based precautions, the respondents were divided, 50% indicated "yes" and 50% indicated "no." This brings about the question of whether the respondents who stated that they utilize verbal notification are only doing so because they do not feel they have adequate written resources. When asked if they feel they have adequate time to provide education, the respondents were divided, 50% indicated "yes" and 50% indicated "no." Nurses are pressed for

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time in the clinical setting and their responses to the follow-up question asking them to explain why they do not feel they have enough time reiterated that.

Research Question	Salient Theme	Quote
If you answered "no" the question which asked if you feel that you have adequate time to provide transmission-based precaution education to visitor during your shift please explain why:	Acuity and number of patients decrease available time	"Patient acuity for other patients. Facility increased the patient ratio..."
	Facility time constraints	"Nursing has less than 1 hour per patient..."
	Unfeasible accessibility	"My patients are scattered everywhere so I don't always see when visitors come and go."

Through these responses it has become increasingly clear that there are areas for improvement in visitor education. Nurses feel as though they do provide verbal education to visitors, but there are definitely limitations on their ability to do so. Time constraints on the busy clinical nurse, and inadequate facility education material, are themes that appeared in the survey and may contribute to visitor noncompliance regarding transmission-based precautions.

The later questions posed in this study's survey were regarding visitors receptivity to education where 80% of respondents indicated they do not believe that visitors are receptive to education when it is provided. The themes in the responses indicated that participants feel that visitors are not receptive to the provided education because of feelings of the threat of illness not being perceived and the inconvenience of wearing PPI. This causes one to wonder about the quality of education regarding the infection cycle.

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Research Question	Salient Theme	Quote
If you answered "no" the question which asked if you feel that visitors adhere to transmission-based precautions, please explain why:	Threat not perceived	"They do not perceive the illness as a serious threat"
	PPI is an inconvenience	"I believe they understand the education, but they do not want to go through the trouble or be uncomfortable to protect themselves."
	PPI is an inconvenience	"...some just don't want to wear PPI"

Lastly, participants were asked to indicate what change they believed could be implemented to increase visitor adherence to transmission-based precaution. This presented a large variety of responses in which education was the theme. Respondents previously indicated that they do provide education, but there are large constraints on their ability; respondents also indicated that visitors are often not receptive to education, but when asked what could be done differently the overwhelming theme is an increase in education.

Research Question	Salient Theme	Quote
If any, please explain what changes you believe could be implemented to increase visitor adherence with transmission-based precautions:	Community education	"Public education..."
	Provide education	"...have them check at the nurses' station before entering so education could be given"
	Better staff and visitor education	"I believe that there could be more handouts available to give to visitors. Staff should be educated on how to handle

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		the situation and how to educate family”
	Need for education	“...visitors do not realize they could get the infection and transmit to others”

Limitations

One limitation to this study is that a new survey instrument was used. Due to an inability to locate a prior constructed survey which could be adapted to this study, the researcher designed the study instrument. Since this was a new instrument, it does not have documented reliability and validity. Additional testing is needed on this instrument.

The participation in this study did not achieve the sample size the researcher intended. The researcher had a goal of obtaining 25-30 responses. Although 29 individuals accessed the survey, only 18 gave consent to participate. This indicates a high dropout rate. One hypothesis about this is that it may have been due to the wording in the consent terms about the time commitment. The time commitment in the consent terms indicated it would take an estimated 30 minutes to complete this survey; this is potentially an over estimation in the amount of time it would take to complete the survey. Additionally, this population of individuals has a particular constraint on their time as they are classified as working students. In future studies these items should be addressed in order to gain a larger sample size.

An additional limitation is that not all questions were answered by the participants. It is unknown if the participants willingly chose to not to participate in all of the questions, as this was their option, or if there was an issue with formatting which caused participant not to answer. This is especially evident in the question asked regarding if visitors are receptive to education on the importance of transmission-based precautions. One idea as to why this may have been an

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issue is that this question was placed near the end of the survey and participants may have lost interest or maxed out the time they were willing to commit to the survey.

Implications for Nursing

Through this study it has been suggested that nurses do not believe that visitors are complying with transmissions based precautions. This insinuates that visitors are not breaking the chain of infection, but rather continuing it. The results of this study are important for nursing, as it suggests possible ways to improve visitor compliance to transmission-based precautions and thereby decrease instances of HAI's.

This study also explored whether nurses are providing education to visitors on the importance of adhering to transmission-based precautions, and suggests there is a need to improve consistency of education and in the number of nurses who provide it. Additionally, the time constraints and access to education materials within the hospital setting need to be addressed.

Larger studies in the future should be conducted to gain a better understanding of nurses' perceptions to visitor's adherence to transmission-based precaution. Future exploration is needed on different education methods in both the community and hospital setting that may increase compliance to transmission-based precautions. Furthermore, additional studies should also be completed to assess this phenomenon from the visitor's perspective.

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