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Editor

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**Hodson Endowed Chair in Entrepreneurship and Business
and**

**Cambridge University and Oxford University as the
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LETTER FROM THE EDITOR

We are extremely pleased to present the *Academy of Health Care Management Journal*, the official journal of the Academy of Health Care Management. The AHCM is an affiliate of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world. The *AHCMJ* is a principal vehicle for achieving the objectives of the organization. The editorial mission of this journal is to advance the knowledge and understanding of the management of health care organizations throughout the world. To that end, the journal publishes high quality, theoretical and empirical manuscripts which advance the discipline.

The manuscripts contained in this volume have been double blind refereed. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies.

Our editorial policy is to foster a supportive, mentoring effort on the part of the referees which will result in encouraging and supporting writers. We welcome different viewpoints because in differences we find learning; in differences we develop understanding; in differences we gain knowledge and in differences we develop the discipline into a more comprehensive, less esoteric, and dynamic metier.

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INFLUENCES OF HOSPITAL STRUCTURE ON MEDICAL MALPRACTICE CLAIM COSTS

Carlton C. Young, Mississippi State University
David R. Williams, Appalachian State University

ABSTRACT

Malpractice is a significant concern in the provision of health care and can be an important performance measure for health care management. Utilizing the resource-based view of the firm, this study examines structural factors affecting the total amount of malpractice claims costs by hospitals in Florida in the year 2000. We found that hospitals employing a greater number of physicians had lower medical malpractice claims costs; however, hospitals employing a greater number of physician residents had higher medical malpractice claims costs. Interestingly, our study found that the number of employed nurses did not affect the medical malpractice claims costs of the hospital.

INTRODUCTION

Over the past decade both public attention and scientific interest have been increasingly drawn to issues of quality in health care and, in particular, issues involving patient safety and errors as revealed in reports such as *To Err is Human* (Institute of Medicine, 1999). Judgments regarding the quality of health care services are often made on the basis of observations about the performance of health care providers on established quality indicators; numerous examples of this can be found through the National Quality Measures Clearinghouse (Berwick, Calkins, McCannon, & Hackbarth, 2006). These judgments are commonly made after observing compliance with clinical quality indicators, such as those used by the Centers for Medicare & Medicaid Services (CMS), i.e. giving aspirin to patients admitted to the emergency department for heart attacks. For those who study the performance of health care organizations there is as much to be learned by observing organizational level outcomes as there is for the clinician in observing patient outcomes. It has been noted that just as clinicians monitor the vital measures of patient health, we should develop and monitor the indicators that inform us of the progress that needs to be made in order to reach organizational goals (Dlugacz, 2006).

One of the most widely accepted models for assessing health care quality was proposed by Avedis Donabedian, and is based on three distinct domains: structure, process, and outcomes. Donabedian defined structure as the environment in which health care is provided; process as the method through which health care is delivered; and outcomes as the result of the health care delivered (Donabedian, 1966). Within these domains, research emphasis is expanding to

supplement judgments on health care quality from those based exclusively upon subjective clinical evidence, to include a broader conceptual range of quality as well as judgments based upon objective quantitative indicators of health care services quality derived from these dimensions of quality of care (Van der Bij & Vissers, 1999).

As data becomes increasingly available, metrics drawn from various dimensions of quality of care are gaining in prominence as quality of care indicators (Romano, Geppert, & Davies, 2003). Additional dimensions of care which focus predominantly on quality are being aggressively developed; for example, the dimensions of effectiveness, safety, timeliness, and patient centeredness as reported in the second annual National Healthcare Quality Report (Agency for Healthcare Research and Quality, 2004). In selecting consequential dimensions of quality of care, it is essential to include aspects of care significant to patients, providers, and those responsible for the management of health care organizations. The examination of outcomes as they relate to health care quality meets this tripartite obligation. As health care organizations are held to higher standards of quality, while simultaneously facing restraints on the costs of providing health care, the examination of organizational outcomes that can inform managerial decisions relating to structure and/or process in health care organizations provides a significant perspective that serves to underscore the importance of looking at medical malpractice as a managerial concern (Young, 2005). Efforts to improve patient quality and safety require organizational learning and change, which is dependent on acquiring actionable data on performance from the domains of structure, process and outcomes (Rivard, Rosen, & Carroll, 2006).

Medical malpractice has been an issue of concern in the provision of health care for thousands of years. First codified by the Babylonians circa 1800 B.C., this inclusion serves as an indication of the importance of this issue for most of recorded history (Smith, 1990). Common law doctrine in the U.S. provides that physicians and other medical providers owe a duty of care to their patients. The intent of the law is to serve as a deterrent to providers engaging in professional negligence, and failing that, to provide for compensation to the victim of the negligence. A breach of this duty that results in injury to the patient is commonly known as malpractice, and subjects the provider to tort liability if the provider is found to be legally culpable for the injuries (Congressional Budget Office, 2006).

Concerns over medical malpractice have been critically examined by numerous scholars over the past several decades (Danzon, 1994). Hyman and Silver state that “malpractice liability is the scourge of modern medicine” (Hyman & Silver, 2004, p. 2). The present study examines a dimension of health care organizational outcomes represented by the medical malpractice claims cost experience of Florida acute care hospitals. Given that all hospitals operate within finite resource limits (i.e. their structure), by logical extension medical malpractice costs are associated with reduced access due to increased costs in the provision of health care (Bodenheimer, 2005). Malpractice is a per se representative of diminished quality, as malpractice is by definition a failure to meet accepted standards of professional care (Young, 2005).

BACKGROUND AND THEORETICAL PERSPECTIVE

The release of the Institute of Medicine's (IOM) report *To Err is Human: Building a Safer Health System*, which estimated that deaths resulting from medical errors could be as high as 98,000 per year, provided the impetus for expanding emphasis within health care research to more closely examine issues related to quality of care (Institute of Medicine, 1999). The subsequent publication of *Crossing the Quality Chasm: A New Health System for the 21st Century* further increased the intensity of the study of health care quality and outcomes at all levels of health care delivery (Institute of Medicine, 2001). Yet, in July of 2004, Healthgrades released a study that reported that the state of health care quality and safety had not improved significantly since the release of the 1999 IOM's *To Err is Human* report and estimated that 195,000 patients die each year from preventable errors (HealthGrades, 2004).

In modern history, one of the goals of imposing malpractice liability has been to align the disincentives of the legal process with economic disincentives to encourage improvement in provider outcomes. In continuing the rationale of economic incentives from a financial perspective, reducing the negative economic consequences of malpractice claims can result in cost savings that may be viewed as positive economic incentives when applied toward meeting organizational goals related to improving access, quality and cost efficiency. Peteraf and Barney (2003) state that a firm has competitive advantage if it creates greater value than its competitor(s) who are producing at closer to breakeven margins. The reduction in costs by avoiding malpractice liability should directly decrease at least some economic costs of the firm, thereby allowing the firm to operate at greater margins with increased competitive advantage.

Medical malpractice claims are not only illustrative of diminished quality, but are associated with reduced access to care and increased costs in the provision of health care. As Donabedian observed: "Wasteful care is either directly harmful to health or is harmful by displacing more useful care" (Donabedian, 1988, p. 4). Hospitals are organizations whose primary purpose is to provide adequate structural and procedural components to deliver health care services that improve health. Medical malpractice is an outcome of this health care delivery process that exemplifies failure to adequately deliver health care. In most instances, this produces not the intended benefits, but a detriment to health. As a failure of the hospital health services delivery process to attain the desired outcome, malpractice does not contribute to organizational efforts to meet goals or achieve its mission. Hospital managers, in the vein of managers in other industries, have an intrinsic responsibility to manage the organization in a manner that is expected to achieve its goals (Davis, Schoorman, & Donaldson, 1997). Therefore as an outcome of an organization, malpractice is an indication of a degree of ineffectiveness in pursuit of the hospital's goals, and when viewed from this perspective, hospital malpractice claim costs are a metric that may be used to evaluate this type of organizational performance failure.

As derived from the management literature, we postulate that the resource-based view theory may offer insights into some degree of the variations in malpractice claims cost performance of the subject hospitals. The resource-based view of the firm (Barney, 1991; Penrose, 1959) is a widely acknowledged theory of how organizations obtain competitive advantage over competing firms (Fahy & Smithee, 1999). This theory suggests that organizations are dependent upon their resources and those in the external environment. Resource dependency is a perspective centered on organizational decisions and adaptation in reaction to environmental forces (Pfeffer & Salancik, 2003). The resource-based view proposes that managers make strategic decisions about the mix of resources acquired and maintained by the firm to generate a competitive advantage, and postulates that this competitive advantage may explain variations in performance between similarly situated firms (Barney, Wright, & Ketchen, 2001; Hoopes, Madsen, & Walker, 2003; Short, Palmer, & Ketchen, 2002). It is believed that these competitive advantages allow firms to realize superior performance (Peteraf & Bergen, 2003).

Previous studies have concluded that acquisition and deployment of resources is a factor in hospital performance (Hansen & Wernerfelt, 1989; Hitt, Bierman, Shimizu, & Kochhar, 2001). Within the domains of structure, process, and outcomes, both structure and process are highly dependent on the resources of the hospital providing health care services; in a less direct way, outcomes are dependent on resources as well. The cost of defending medical malpractice claims is a drain on health care financial resources estimated to be approximately \$6.5 billion in 2001 (Anderson, Hussey, Frogner, & Waters, 2005). The Congressional Budget Office estimates that “the direct costs that providers will incur in 2009 for medical malpractice liability- which consist of malpractice insurance premiums together with settlements, awards, and administrative costs not covered by insurance- will total approximately \$35 billion, or about two percent of total health care expenditures” (Congressional Budget Office, 2009). Prior research indicates that professional staffing levels, hospital size, hospital location, and the teaching status of hospitals are among some of the factors which are conceptually linked to the hospitals resource base, and may influence hospital performance (West, 2001).

The resource-based view of the firm substitutes two alternate assumptions in analyzing sources of competitive advantage. First, the resource-based view assumes that firms within an industry may be heterogeneous with respect to the strategic resources they control. Secondly, it assumes that these resources may not be perfectly mobile across firms, and thus heterogeneity can be long lasting. Of course, not all firm resources hold the potential of sustained competitive advantages. To have the potential of sustained competitive advantage, a firm’s resource must have four attributes: (a) it must be valuable, in the sense that it can exploit opportunities and/or neutralize threats in a firm's environment, (b) it must be rare among a firm's current and potential competition, (c) it must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for this resource that are valuable, but neither rare or imperfectly imitable (Barney, 1991). Professional employee assets can be a source of competitive advantage for the reason that

their professional knowledge and inter-personal working relationships are difficult to imitate. Resources are valuable when they enable an organization to employ strategies that improve its efficiency or effectiveness (Mukamel, Zwanziger, & Bamezai, 2002). As in most markets there are shortages of key personnel (e.g. physicians and nurses) (American Hospital Association, 2006), and hospitals compete with each other for valuable resources in order to gain competitive advantage. An aspect of this competitive advantage is higher quality of care as indicated by lower malpractice costs. Thus, we hypothesize:

Hypothesis 1: Hospitals employing a greater number of registered nurses will experience lower malpractice claims cost than those hospitals employing fewer registered nurses.

Hypothesis 2: Hospitals employing a greater number of licensed practical nurses will experience lower malpractice claims cost than those hospitals employing fewer licensed practical nurses.

Hypothesis 3: Hospitals employing a greater number of physicians will experience lower malpractice claims cost than those hospitals employing fewer physicians.

Hypothesis 4: Hospitals employing a greater number of physician residents will experience lower malpractice claims cost than those hospitals employing fewer physician residents.

METHODOLOGY AND DATA

This study uses cross-sectional data, with the individual hospital serving as the primary unit of analysis. Cross-sectional analysis depends entirely on variation across units of analysis for the demonstration of association (Kaluzny & Veney, 1980). The sample consists of general, non-federally owned, acute care hospitals in the state of Florida in the year 2000. Data come from three sources: (1) the Florida Department of Insurance's Medical Professional Liability Closed Claims (FMPLC) data set, which contains information on the malpractice claims experience of insured medical professionals and health care organizations, including hospitals, (2) the American Hospital Association's (AHA) Annual Survey of Hospitals data set which contains information on the characteristics of the hospitals in this study, and (3) the Centers for Medicare & Medicaid Services (CMS) which provides case mix information for each hospital.

As medical malpractice is an abstract construct that is difficult to measure directly, researchers typically measure it indirectly in the context of reported outcomes by examining administrative data for various proxy indicators believed to be logically correlated to the phenomenon (Thomas & Petersen, 2003). These proxy indicators include the frequency and magnitude of malpractice events, the frequency of claims made, the frequency of claims closed, the frequency of claims settled before trial, the frequency of claims dismissed by courts, the

magnitude (i.e., dollar amount) of malpractice claims made, the magnitude of claims settled, or the magnitude of verdict awards. This study uses the outcome indicator of total malpractice claims costs by hospital, with such claims being considered “closed” as its proxy indicator or dependent variable for medical malpractice. The source of the dependent variable (e.g. hospital total claims cost) is from the FMPLC.

Data from a single state was selected as to eliminate state-to-state variations in tort laws that might influence the incidence of claims filed, or claims closed. Florida data was selected due to the state mandated reporting of claims, the standardization of reported data elements within the Florida dataset, and the public availability of the data. Other studies have examined single state administrative data to access the qualitative outcomes of hospitals. For example, a study of California hospitals on self-reported post-operative complications found that complication rates were under-reported (Romano, Chan, Schembri, & Rainwater, 2002). Furthermore, it is believed that the reporting of medical malpractice claims costs in the Florida data will likely approximate the true incidence of claims costs, as the reporting of claims are a legal requirement of operation, and failure to report claims and their costs is not “incentivised” as the reporting does not obviate the need to defend the claim or mitigate the potential costs of the claim to the hospital.

This study also uses existing descriptive data on the subject hospitals from the AHA’s Annual Survey for the year 2000. In order to compare similar facilities, selections were made of hospitals by state (AHA variable coded *mlocstcd* = 39, Florida; with 245 records selected), type (general medical and surgical, AHA variable coded *serv* = 10; with 196 records selected), and whether they were short-term or long-term stay (AHA variable coded *mlos* = 1, short-term; with 194 records selected). Exclusion of hospitals not meeting the above criteria resulted in a reduction in the number of hospitals to be examined, leaving an intermediate sample of 194 hospitals (79 percent of the total Florida general medical and surgical hospitals in 2000 selected from the overall population of 245 Florida facilities reporting claims during the selected period).

The AHA Annual Survey dataset and the FMPLC dataset were merged using the unique federally issued Medicare identification number for each hospital as the matching variable. Only those hospitals that were present in both datasets were selected (i.e., only hospitals with closed claims). This resulted in an intermediate sample of 132 hospitals (53 percent of the total Florida general medical and surgical hospitals in 2000), with 870 medical professional liability claims.

As the sample included hospitals over a large geographic area and included all of the subject hospital’s admissions (including DRGs), it was thought best to apply a risk adjustment factor to control for the variance in the severity of illness of patients admitted to the subject hospitals (Iezzoni, 1997). In order to risk adjust the hospital malpractice claims data for the differing severity of illness levels at each hospital, the Centers for Medicare & Medicaid Services’ case-mix index data for the sample Florida hospitals were obtained and used as a control variable. We also controlled for tax status (e.g. for-profit/not-for-profit), size of the metropolitan statistical area (MSA) in which the hospital is located (a market characteristic

variable), and size of the hospital in terms of the hospital's total expense. This data was derived from the AHA dataset.

The AHA/FMPLC sample dataset was merged with the CMS case-mix index data using the unique federally issued Medicare identification number for each hospital as the matching variable. Only those hospitals that were present in all three datasets were selected. In addition, only FMPLC claims closed in the year 2000 were selected. This resulted in a sample of 119 hospitals (49 percent of the population of general medical and surgical hospitals, and 90 percent of the hospitals with closed claims in 2000).

Our independent variables are number of licensed practical nurses (LPNs), number of registered nurses (RNs), number of physician residents, and number of employed physicians. This information was found in the AHA dataset. The values for total claims costs, metropolitan statistical area, hospital total expense, number of licensed practical nurses, number of registered nurses, number of physician residents, and number of employed physicians had non-normal distributions that were positively skewed. These variables were log transformed, with positive values added prior to logarithmic transformation where appropriate. Logarithmic transformation is an accepted method of correcting for positive skewness (Newton & Rudestam, 1999). After log transformation, an extreme value was identified and eliminated from the sample, leaving a sample of 118 hospitals (48 percent of the population of general medical and surgical hospitals, and 89 percent of the hospitals with closed claims in 2000). The sample size exceeds the recommended seven observations to one variable ratio suggested by Hair (Hair, Anderson, Tatham, & Black, 1998). We performed multiple regression analysis using the SPSS (version 14.0) statistical software package.

RESULTS

Table 1 lists the means, standard deviations and correlations for all 118 hospitals. There are significant positive correlations between the total claims costs and the metropolitan statistical area, case mix index, hospital total expense, number of licensed practical nurses, number of registered nurses, and number of physician residents.

Table 2 presents the coefficients for the multiple regression analysis (N=118). To test for multicollinearity, we assessed the variance inflation factor (VIF). The highest VIF for the variables is less than 6.8, which is below the rule that VIF should not exceed a value of 10 (Hair, et al., 1998). The linear combination of hospital and market characteristics were significantly related to the hospital total claims cost, $F(8, 116) = 5.068, p = .000$. The sample multiple correlation coefficient was .522, indicating that approximately 27.3 percent of the variance of the criterion variable hospital total claims costs in the sample can be accounted for by the linear combination of hospital and market characteristics. The results from the multiple regression analysis found two variables (e.g. number of physician residents and number of employed physicians) that were statistically significant ($p < .05$) within the overall model. There were no

statistically significant relationships between our control variables (e.g. MSA size, for-profit status, hospital total expenses, case mix) and the hospital total claims costs.

	Mean	S.D.	1	2	3	4	5	6	7	8
1 Hospital Total Claims Cost (LN)	13.402	1.588	-							
2 MSA (LN)	2.607	.131	.270**							
3 For Profit	.500	.502	.021	-.007						
4 Case Mix Index	1.450	.236	.311**	.283**	-.169					
5 Hospital Total Expense (LN)	18.291	.890	.443**	.382**	-.373**	.681**				
6 LPNs (LN))	3.785	.602	.366**	.254**	-.153	.433**	.704**			
7 RNs (LN)	5.500	.907	.421**	.364**	-.284**	.621**	.902**	.771**		
8 Residents (LN)	2.640	.674	.270**	.241**	-.331**	.305**	.497**	.402**	.466**	
9 Physicians	2.809	.642	.118	.210*	-.458**	.364**	.557**	.553**	.535**	.733**
* $p < .05$			** $p < .001$			N= 118				

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
MSA (LN)	.961	1.084	.079	.887	.377
For Profit	.319	.310	.103	1.032	.304
Case Mix Index	.168	.752	.025	.223	.824
Hospital Total Expense (LN)	.621	.390	.339	1.593	.114
LPNs (LN)	.519	.362	.199	1.433	.155
RNs (LN)	-.025	.366	-.014	-.067	.946
Residents (LN)	.742	.287	.321	2.586	.011
Physicians	-.969	.346	-.399	-2.803	.006
N=118					

The results from the analysis verify hypothesis 3 that there is a negative relationship between hospital total claims costs and the number of employed physicians on a hospital's medical staff. Despite the statistically significant findings related to number of physician residents and hospital total claims costs, the results from the analysis do not, however, verify hypothesis 4 in that the direction of the relationship is counter to that proposed. We had hypothesized that there was a negative relationship between number of physician residents and hospital total claims costs. Our findings indicate a positive relationship exists within this model.

Neither of the two variables related to hypothesis 1 (e.g. registered nurses) nor hypothesis 2 (e.g. licensed practical nurses) were found to be statistically significant. Thus, we were able to verify only one of the four hypotheses.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

There are several limitations to our study related to generalizability. We recognize that the sample size is modest. This is due to the fact that we chose one state and one year. We have previously noted the reasons for limiting our sample to this state and year. We also acknowledge that all the firms selected had “closed” malpractice claims. Thus, we do not know if our results would apply to hospitals with “open” claims or hospitals with no claims whatsoever. Further research is needed using other states, time periods, and comparisons between hospitals with claims and those without claims. A longitudinal study using Florida data may shed light on this issue as well. It would also be beneficial to verify our hypothesis using other proxy indicators (e.g. the frequency and magnitude of malpractice events, the frequency of claims made, the frequency of claims settled before trial, the frequency of claims dismissed by courts) besides the proxy of hospital total claims costs to verify or challenge our results.

In addition, all of the data used consisted primarily of administrative data. The omission of clinical data is acknowledged to be a potential concern which may reduce the predictive potential of the model. Studies which lack clinical data have been criticized for not making adequate adjustments to account for the variation in the underlying patient factors or the hospital case mix. Our study controlled for case mix; however, further research is needed utilizing both finer-grain clinical data and multiple clinical variables. Malpractice claims cost analysis is also subject to hindsight bias (Thomas & Petersen, 2003).

Another limitation is that we only measure the number of employed physicians, physician residents, and nurses. We do not make any distinctions between types (e.g. specialties), training, or credentials of physicians. It may be informative to know if hospitals with physicians with more training (i.e., with more specialists) had higher total medical malpractice costs or not. Also, we do not know what effect other non-employed physicians would have on our model.

DISCUSSION AND PRACTITIONER IMPLICATIONS

This study seeks to understand the relationship between the resources available to a hospital and its experience with medical malpractice costs. This is important to researchers and practitioners alike as malpractice claims costs are associated with reduced access, diminished quality, and increased cost in health care. Borrowing from the resource-based view of the firm, we hypothesized that those firms with greater resources (as measured by our proxy variables consisting of LPNs, RNs, physician residents, and employed physicians) would have fewer hospital total claims costs.

Our study found limited support for our hypotheses, as it found that hospitals with a greater number of employed physicians on its staff had fewer hospital total claims costs. Interestingly and counter to our hypothesis, hospitals with a greater number of physician residents also experienced greater hospital total claims costs. There was no statistically significant relationship between hospital total claims costs and the number of licensed practical nurses or registered nurses. Neither was there a statistically significant relationship between hospital total claims costs and the hospital and market characteristic control variables. For hospitals (and within the limitations as specified), this may suggest that adding employed physicians to their medical staff might reduce medical malpractice costs; whereas, adding physician residents may increase medical malpractice costs, while adding nurses (either LPNs or RNs) would have little effect either way on medical malpractice costs.

Our findings suggest that irrespective of the size of the metropolitan statistical area in which the hospital was located, tax status (control type) of the hospital, size of the hospital as measured by total expense, or severity of illness of patients as measured by their case mix index, hospitals with more employed physicians on their medical staff incurred less total claims costs. There may be several reasons for this. Although the focus of this paper is not on vertical integration, we may be seeing one aspect of the much touted positive effects of vertical integration between hospitals and physicians. Proponents of vertical integration have argued that employing physicians should lead to better coordination of care and reduced costs (Harris, Ozgen and Ozcan, 2000; Wan, Blossom and Allen, 2002). Reduced hospital total claims costs may be one aspect of this.

It also may be that hospitals with more employed physicians were able to attract other physicians in the first place due to its reputation as a “quality” facility. Hospitals with more employed physicians also may have more or better technology compared to hospitals with fewer physicians—it should be noted that physicians (not nurses) drive technology acquisition and use—with access to technology potentially alleviating claims costs—we do not know. Hospitals with more employed physicians may also have more physicians with more specialized training leading to more accurate diagnosis and treatment. Associated with this, hospitals with more employed physicians may have more stringent credentialing criteria for their physicians. Thus, the medical staffs of hospitals with more physicians may be able to restrict physicians with less training from caring for patients that they otherwise would not had there been more (qualified) physicians available. We do not know if this is true, but as mentioned in the above limitations section, more research is needed in this area. Our findings, however, suggest that there is a relationship between larger employed physician bodies and fewer hospital total claims costs.

Our findings also suggest that hospitals with more physician residents had higher hospital total claims costs. We did not make a distinction between hospitals that were primarily academic teaching hospitals and hospitals that were not primarily academic teaching facilities but had physician residents on their medical staff. This is an additional limitation to the study. We viewed physician residents as an additional resource for the hospital, supplementing existing

resources and producing a higher quality of outcomes (Allison, et al., 2000). One explanation of our finding may be that physician residents are not a supplement but rather a substitute for physicians. From this perspective, our findings may suggest that hospitals need to be careful of adding physician residents without also adding additional physicians to monitor their activities.

For hospitals, our findings related to nurses suggest that adding nurses have little effect on hospital total claims costs. An interesting aspect of our findings is that the direction of the relationship between types of nurses (e.g. RN, LPN) and hospital total claims costs is different. As hypothesized, there is a negative relationship between hospital total claims costs and registered nurses, though not statistically significant. However, like physician residents, there is a positive relationship between hospital total claims costs and licensed practical nurses. Though not tested, this finding does suggest that hospitals that substitute LPNs for RNs may risk increasing their hospital total claims costs.

When taken together, our results indicate to hospitals that increasing the number of employed physicians may reduce their total claims costs, while adding physician residents may increase their total claims costs. The number of nurses employed by a hospital does not appear to have an effect on hospital total claims costs, however, the mix of nurses (e.g. RNs, LPNs) may be worthy of consideration by hospitals as they think about their effect on hospital total claims costs, and more importantly, their quality of care for which hospital total claims costs could be but one proxy.

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STUDENT ATTITUDES TOWARDS A TOBACCO FREE CAMPUS POLICY

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ABSTRACT

According to the United States Department of Health and Human Services, using policies such as smoke free environments are considered high impact public health interventions. In 2006, approximately 19.2 percent of college students smoked. Although this is the lowest reported rate in nearly thirty years, the percentage is well above the U.S. Department of Health and Human Services 2010 goal of reaching a 12 percent adult smoking rate and the National College Health Assessment's Healthy Campus 2010 goal of reducing cigarette smoking by college students to below 10.5 percent. In August 2007, Lander University, a small undergraduate liberal arts institution, located in Greenwood, South Carolina, adopted a tobacco free campus policy. A randomized anonymous survey was developed and given to Lander students in the spring semester of 2008. The survey focused on the following: 1) student's tobacco use status; 2) student awareness of the new policy and the smoking cessation program; 3) attitude towards the policy ; 4) if the policy would deter or encourage students from attending or transferring to or from the University; and 5) if students would report violators of the policy. This paper will discuss the results of this survey and provide recommendations on how to effectively implement a tobacco free campus policy.

INTRODUCTION

Smoking is considered one of the most preventable causes of disease and death in the U.S. The Environmental Protection Agency has classified secondhand smoke as a Group A carcinogen, a substance known to cause cancer in humans (EPA, 2009). According to the United States Department of Health and Human Services, using policies such as smoke free environments are considered high impact public health interventions. (USDHS, 2006). In 2006, approximately 19.2 percent of college students smoked. Although this is the lowest reported rate in nearly thirty years, the percentage is well above the U.S. Department of Health and Human Services 2010 goal of reaching a 12 percent adult smoking rate and the National College Health Assessment's Healthy Campus 2010 goals of reducing cigarette smoking by college students to below 10.5 percent (ACHA, 2007). Approximately 50 percent of college smokers may be social smokers which mean they smoke when they are around their peers (Big Tobacco, 2008). Studies have indicated that lifestyle behaviors learned in college may continue throughout their life, so if there is a policy restriction on smoking in the college environment, it may reduce the number of smokers. According to the American NonSmokers Rights

Foundation, there are currently 305 U.S. colleges and universities that have a 100 percent smoke free campus (American Nonsmokers, 2009).

In August 2007, Lander University, a small undergraduate liberal arts institution, located in the southern United States, adopted a tobacco free campus policy (Appendix 1). It prohibits all tobacco use on campus property. The policy also prohibits campus organizations from accepting money or gifts from tobacco companies and bans tobacco advertisements on the campus. Tobacco users are fined by campus security if they are found violating the policy. In addition, smoking cessation programs were offered free of charge to anyone who wants to stop smoking. The Lander Wellness Center, the University health center, provides free counseling to students who want to quit smoking. There has been much discussion regarding the effectiveness of this policy. Many felt that it would discourage students from attending this University—others felt that it would encourage non tobacco users to attend this institution. As a result of the ongoing discussion, a random anonymous survey was developed and given to Lander students in the spring semester of 2008. The survey focused on the following: 1) students' tobacco use status; 2) students' awareness of the new policy and the smoking cessation program; 3) attitudes towards the policy; 4) the policy's impact on students' decisions to transfer to or from the University; and 5) students' willingness to report violators of the policy. Quantitative analyses were performed to determine any statistically significant results of the survey.

LITERATURE REVIEW

The American College Health Association (ACHA) supports tobacco-free environments and supports efforts to minimize exposure to smoke. (ACHA, 2007). Studies have indicated that students continue the behavior learned in college throughout their lives. Therefore, it is important to target this population to change their unhealthy behavior. If students characterize themselves as social smokers, it will have an impact on whether they will quit or not. Moran, Wechsler and Rigotti (2004) performed a cross sectional random sample survey in 2001 of 21,055 students enrolled at 119 nationally representative U.S. colleges to assess if students considered themselves "social smokers" - smokers that only smoke with others or only in social situations. The survey also assessed a pattern of social smokers and smoking cessation. Regression analyses indicated that there was an interaction between social smoking and smoking intensity. Occasional smokers were less likely to have tried to quit within the last year because they feel they don't smoke that much and don't have a dependence on nicotine.

Recent research suggests that college smoking cessation programs are more effective if performed by peers. Ramsay and Hoffmann (2004) developed a pilot demonstration project to assess smoking cessation program effectiveness on college students. Their pilot study was based on literature that indicated there were many programs available to undergraduate students but few were successful. Their discussions with student groups indicated that they would be more likely to ask for assistance from someone in their age group to stop smoking. The peer

facilitators were trained by the American Lung Association. Of the 68 participants who completed the program, 60 (88.2 percent) quit using the program. The peer facilitators adapted the program to student life pressures such as taking exams and writing papers. The study also indicated that a smoke free environment supported students' quitting.

In addition to campus tobacco policies, there are other influences in a students' life that must be taken into account when analyzing data on tobacco free campus policies. Rigoti, Moran and Wechsler (2005) examine the exposure of college students to tobacco marketing events at bars, nightclubs, and other social venues. Using the 2001 Harvard College Alcohol Study of 11,000 respondents which asked students how often they attended social events that were sponsored by tobacco vendors. Results indicated that tobacco sponsored events increased the student smoking rate and had a negative impact on cessation efforts. Lander has also established a policy against organizations accepting money or gifts from tobacco companies, indicating support of this issue.

Wechsler and Rigoti (1999) implemented a national survey of college students at 128 four-year colleges in the U.S. regarding tobacco use. This survey was based on their 1993 and 1997 Harvard School of Public Health Alcohol Study. The purpose of these studies was to examine students' risk behaviors such as alcohol and tobacco use. The authors conducted a comparison of smoking behaviors of students living in smoke-free residences to those of students living in unrestricted residences. Results indicated that those students living in smoke free residences smoked less than students who lived where smoking was permitted. However, this conclusion was true only for students who were not regular smokers before the age of 19. Students who were regular smokers before the age of 19 were not impacted by their environment. This study validates that there is a health behavior change as a result of a tobacco free environment but a change may also be based on a student's history of tobacco use.

College smoking appears to be popular among both male and female students (Rigotti et al, 2000). According to Nichter, Nichter, Lloyd-Richardson, Flaherty, Carkoglu & Taylor (2006), smoking occurred among both genders while drinking alcohol at parties and on weekends. Females who engage in other behaviors such as binge drinking and marijuana use were also found to be more likely to smoke.

Trinidad, Gilpin and Pierce (2004) examined compliance with California's high school smoke-free campus policies before and after their implementation in 1995. Smoking prevention education programs were also implemented. Results indicate that student smokers' compliance to this policy increased from 43.7 percent in 1995 to 71.5 percent in 2002. Although this cohort was younger than the target population of this proposal, the study also supports that smoke free policies have a positive impact on students' smoking behavior.

It is critical that smoking prevention programs are implemented in conjunction with smoking bans Borders, Xu, Bacchi, Cohen & SoRelle-Miner (2005) performed a web-based survey on 13,000 undergraduate students in the state of Texas. Interestingly, preventive

education programs decreased the odds of smoking by about 23 percent. Smoking cessation programs, however, were underutilized by students.

Whipple, Caldwell, Simmons & Dowd (2008) emphasized the importance of encouraging compliance by educating the targeted audience on the health effects of tobacco use prior to the implementation of the smoke free policy. They analyzed the Community Readiness Model which provided an opportunity to educate the community of the University of North Carolina campuses on the smoke free policy. Results indicated that the model was successful in gaining acceptance of the policy prior to its implementation on campus. The literature review indicates that smoke free policies lower the prevalence of smoking. However it is important to collaborate with the targeted group prior to the policy implementation to encourage compliance. Students smoke as a result of social activities such as drinking or fraternizing with friends who smoke so educational institutions establishing a ban on accepting money or gifts from tobacco companies and to ban advertisement of tobacco companies may have an impact on student tobacco use. The literature review also emphasizes that traditional smoking cessation programs for students have not been successful but developing a program in conjunction with student peers may have an impact.

RESEARCH DESIGN

In August 2007, Lander University, a small undergraduate liberal arts institution, located in Greenwood, South Carolina, adopted a tobacco free campus policy (Appendix 1). It prohibits all tobacco use on campus property. The policy also prohibits campus organizations from accepting money or gifts from tobacco companies and bans tobacco advertisements on the campus. Tobacco users are fined by campus security if they are found violating the policy. In addition, smoking cessation programs were offered free of charge to anyone who wants to stop smoking. The Lander Wellness Center, the University health center, provides free counseling to students who want to quit smoking. There has been much discussion regarding the effectiveness of this policy. Many felt that it would discourage students from attending this University—others felt that it would encourage non tobacco users to attend this institution. As a result of the ongoing discussion, a randomized anonymous survey was given to Lander students in the spring semester of 2008. The survey focused on the following: 1) students' tobacco use status; 2) students' awareness of the new policy and the smoking cessation program; 3) attitudes towards the policy; 4) the policy's impact on students' decisions to transfer to or from the University; and 5) students' willingness to report violators of the policy.

The research design is a randomized survey. The authors of the survey asked the registrar for a list of unduplicated classes that were being taught during spring 2008. A random number table was generated in excel. This table was applied to the list of classes supplied by the registrar. It must be noted that the list of classes supplied by the registrar contained students enrolled in multiple classes so it was important to eliminate duplicate responses.

DISCUSSION OF SURVEY RESULTS

Table 1 provides a summary of the descriptive statistics of survey participants. Of the 794 students who completed the survey, 22.4 percent or 178 students claimed to be tobacco users. Roughly 65 percent or 517 of the participants were female, which is representative of the general student body. Participants were fairly evenly distributed across class rank (freshmen, sophomores, juniors and seniors) and over 71 percent or 562 students were between the ages of 17 and 21. Over 40 percent or 319 participants were either freshmen or transfer students which allows for the study of the impact of the tobacco free campus policy on enrollment.

Table 1: Who Are Tobacco Users?			
	All Students (%)	Users (%)	Non-users (%)
Tobacco status (n=794)	100	22.4	77.6
Gender (n=791)			
Male	34.6	50.0	30.2
Female	65.4	50.0	69.8
		$\chi^2=23.9$	<i>P-value = 0.000</i>
Class rank (n=786)			
Freshman	27.2	28.7	26.8
Sophomore	24.5	21.4	25.5
Class rank (n=786)			
Junior	24.9	23.6	25.3
Senior	23.3	26.4	22.4
		$\chi^2=2.26$	<i>P-value = 0.519</i>
Age Group (n=789)			
17-21	71.2	64.6	73.2
22-25	22.6	30.9	20.1
26-29	2.2	2.3	2.1
30-33	1.1	0.6	1.3
34 or older	2.8	1.7	3.0
Other	0.1	0	0.2
		$\chi^2=10.48$	<i>P-value = 0.063</i>
Freshmen or Transfer (n=794)			
Yes	40.2	57.9	60.4
No	59.8	42.1	39.6
		$\chi^2=0.37$	<i>P-value = 0.545</i>

Table 1 also summarizes the descriptive statistics of survey participants based on their smoking status. A Pearson chi-square test of independence was conducted to determine whether there were any statistically significant differences across characteristics between tobacco users and non-users. The Pearson chi-square test of independence allows researchers to determine if two independent variables occur independently of each other. The null hypothesis is rejected if a relatively large chi-square value and a small corresponding p-value are observed. The results of this test reveal statistically significant differences across genders and age groups. Tobacco users were more likely to be male than were non-users (50 percent or 397 participants compared to only 30.2 percent or 240 participants) and less likely to be female than were non-users (50 percent compared to 69.8 percent or 554 participants). The results also suggest that tobacco users were slightly older than non-users. Approximately 31 percent or 246 users were between the ages of 22 and 25 compared to only 20.1 percent or 158 non-users. Non-users were more likely to be between the ages of 17 and 21. The chi-square test results do not suggest that there is an association between tobacco use and class rank or freshman/transfer status.

Survey participants who indicated that they were users of tobacco were asked a series of follow-up questions to evaluate the impact of the tobacco free policy on their use of tobacco products and students' awareness of cessation programs offered by the university. Table 2 presents a summary of the results of these survey questions. Approximately 15 percent or 25 users reported that they have decreased their use of tobacco products as a result of the tobacco free campus policy. A smaller percentage of users (6.8 percent or 11 students) claim to have considered quitting the habit as a result of the policy. Nearly 43 percent or 68 users indicated an awareness of the services available on campus with 3 percent or 2 users report that they would attend or have attended cessation programs on campus. This low percentage indicates there may be a need to increase the marketing of the smoking cessation program or develop a program using student peers in the smoking cessation program, a success noted in the study by Ramsay and Hoffman (2004).

All survey participants were asked a series of questions to gauge their reactions to the tobacco free policy and the impact the policy may have on their enrollment decisions. Table 3 presents a summary of the results of these survey questions. Note that columns two and three of the table display a summary of survey responses based on tobacco use status. A majority of students (57.8 percent or 453) support the university's decision to go tobacco free, 24.5 percent (192) do not support the policy and the remaining 17.7 percent (139) did not have a strong opinion about the policy. It comes as no surprise that support for the policy is greater among non-users than among users. Nearly 70 percent or 422 non-users are in favor of the policy compared to only 17.6 percent or 31 users. However, the fact that nearly one in every five tobacco users supports the policy despite the fact that it would severely restrict their freedom seems significant enough to note.

Survey Question	Frequency	Percent
Do you think the tobacco free campus policy has decreased your use of tobacco products?		
Yes	25	15.1
No	141	84.9
Have you thought about quitting as a result of the tobacco free campus policy?		
Yes	11	6.8
No	151	93.2
Are you aware of the free tobacco cessation services available on campus?		
Yes	68	42.8
No	91	57.2
Would you attend/have you attended cessation services on campus?		
Yes	2	2.9
No	66	97.1

	All Students (%)	Users (%)	Non-users (%)
Support Tobacco Free Policy (n=784)			
Yes	57.8	17.6	69.4
No	24.5	61.4	13.8
No opinion	17.7	21	16.8
		$\chi^2=190.76$	$P\text{-value} = 0.000$
Encourage Friends to Attend (n=786)			
Yes	23.4	8.6	27.7
No	24.7	59.4	14.7
Does not matter	51.9	32	57.6
		$\chi^2=148.48$	$P\text{-value} = 0.000$
Considering transferring (n=784)			
Yes	6.8	21.7	2.5
No	73.5	56.6	78.3
Does not matter	19.8	21.7	19.2
		$\chi^2=83.71$	$P\text{-value} = 0.000$
Willing to report violators (n=769)			
Yes	18.9	4.7	22.8
No	81.1	95.3	77.2
		$\chi^2=28.62$	$P\text{-value} = 0.000$

Although administrators had hoped that a tobacco free campus would attract higher enrollments, at this point, the policy appears to have a fairly neutral impact. Nearly 52 percent or

408 students report that the tobacco free policy would have no impact on their willingness to market the university to their friends. Approximately 23 percent or 184 students would encourage friends to enroll because of the policy which is positive, while nearly 25 percent or 194 students would discourage friends from enrolling as a result of the policy. These responses seemingly cancel each other out in terms of their impacts on enrollments. Again as expected, there were statistically significant differences between the responses of users and non-users. In response to the policy, users were much more likely to share a negative opinion of the university with friends than were non-users. Roughly 60 percent (104) users would not encourage their friends to attend after the implementation of the policy compared to only 14.7 percent (90) of non-users. These results indicate that it is important to develop strategies to offset the number of tobacco users who would not encourage friends to attend Lander because of the potential negative impact on the enrollment.

Prior to the implementation of the policy, opponents feared that enrollment would actually decrease dramatically as a result of tobacco users transferring to other universities where tobacco was not banned. The results reported in Table 3 suggest that these fears will likely not become a reality as 6.8 percent (53) of all survey participants reported that they would consider transferring to another university as a result of the policy. Even among tobacco users, the propensity to transfer was only 22 percent or 38 students. The survey results also support the opponents' argument that the policy would be difficult to enforce. Nearly 19 percent or 145 students declared they would be willing to report their peers who are violating the tobacco free policy. This percentage is of course much smaller at 4.7 percent (8) among users and larger at 22.8 percent (137) among non-users.

These results suggest that students are unwilling to self-police the tobacco ban and that the university will have to identify other strategies such as increased education regarding the serious health effects of smoking.

Table 4 reports a summary of survey responses across genders. Several important differences of opinions on the tobacco free campus policy exist between males and females. First it should be noted that in this sample males were more likely to be tobacco users than were females. Nearly 33 percent or 262 males were self-reported tobacco users compared to slightly more than 17 percent or 135 females. Given this statistic, it comes as no real surprise that females were more likely to support the tobacco free policy, more likely to encourage friends to attend the university due to the policy, less likely to consider transferring and more willing to report violators.

Table 5 attempts to isolate the impact of gender from the impact of tobacco use status on survey opinions by summarizing the results by use status and gender. The results reported in the first two columns of this table suggest that there are few statistically significant differences between male and female tobacco users. Female users were more likely to be between the ages of 17 and 21 and are less likely to consider transferring in response to the policy.

Table 4: Differences of Opinions on the Tobacco Free Campus Policy across Genders		
	Females (%)	Males (%)
Tobacco status		
User	17.2	32.5
Non-users	82.8	67.5
	$c^2=23.94$	$P\text{-value} = 0.000$
Class rank		
Freshman	30.2	21.6
Sophomore	24.1	25.3
Junior	22.8	28.9
Senior	22.8	24.2
	$c^2=7.76$	$P\text{-value} = 0.05$
Age group		
17-21	74.6	64.8
22-25	18.6	30
Age group		
26-79	2.5	1.5
30-33	1.2	1.1
34 or older	2.9	2.6
Other	0.2	0
	$c^2=14.27$	$P\text{-value} = 0.014$
Freshmen or Transfer		
Yes	41.2	38
No	58.8	62
	$c^2=0.78$	$P\text{-value} = 0.376$
Support Tobacco Free Policy		
Yes	65.5	43.1
No	19.7	34.1
No opinion	14.8	22.8
	$c^2=36.76$	$P\text{-value} = 0.000$
Encourage Friends to Attend		
Yes	27.6	15.3
No	19.2	35.4
Does not matter	53.2	49.3
	$c^2=30.62$	$P\text{-value} = 0.000$
Considering transferring		
Yes	4.3	11.7
No	77.3	65.7
Does not matter	18.4	22.6
	$c^2=19.09$	$P\text{-value} = 0.000$
Willing to report violators		
Yes	22.3	12.1
No	77.7	87.9
	$c^2=11.77$	$P\text{-value} = 0.001$

Table 5: Differences In Opinions across Genders by Tobacco Use Status				
	Users		Non-users	
	Male (%)	Female (%)	Male (%)	Female (%)
Class rank				
Freshman	25.8	31.5	19.6	30
Sophomore	20.2	22.5	27.7	24.5
Junior	27	20.2	29.9	23.3
Senior	27	25.8	22.8	22.2
	$c^2=1.47$	$P\text{-value} = 0.688$	$c^2=7.87$	$P\text{-value} = 0.049$
Age group				
17-21	58.4	70.8	67.9	75.4
22-25	38.2	23.6	26.1	17.6
26-79	0	4.5	2.2	2.1
30-33	1.1	0	1.1	1.4
34 or older	2.3	1.1	2.7	3.3
Other	0	0	0	0.2
	$c^2=9.36$	$P\text{-value} = 0.051$	$c^2=6.29$	$P\text{-value} = 0.279$
Support Tobacco Free Policy				
Yes	16.1	19.1	56.1	75.3
No	62.1	60.7	20.6	11.1
No opinion	21.8	20.2	23.3	13.6
	$c^2=0.29$	$P\text{-value} = 0.863$	$c^2=22.08$	$P\text{-value} = 0.000$
Encourage Friends to Attend				
Yes	8.1	9.1	18.8	31.4
No	60.9	56	23.2	11.2
Does not matter	31	33.9	58	57.4
	$c^2=0.17$	$P\text{-value} = 0.918$	$c^2=19.6$	$P\text{-value} = 0.000$
Considering transferring				
Yes	29.1	14.6	3.4	2.1
No	52.3	60.7	72.1	80.8
Does not matter	18.6	24.7	24.6	17.1
	$c^2=5.51$	$P\text{-value} = 0.064$	$c^2=5.68$	$P\text{-value} = 0.058$
Willing to report violators				
Yes	3.5	6	16.3	25.5
No	96.5	94	83.7	74.5
	$c^2=0.61$	$P\text{-value} = 0.438$	$c^2=6.07$	$P\text{-value} = 0.014$

Only 14.6 percent (13) of female users indicate that they would consider transferring to avoid the ban on tobacco compared to 29.1 percent (25) of males. The final columns of this table

suggest that there are a greater number of differences in opinions of male and female non-users. Females again appear to view the tobacco free policy more favorably than do males even after controlling for tobacco use. To begin, three out of four female non-users support the tobacco free policy compared to roughly one out of two male non-users. Approximately 31 percent or 134 female non-users would encourage friends to attend as a result of the policy compared to only 19 percent or 34 males. Females were also slightly less likely to consider transferring as a result of the policy and much more willing to report violators than were males. This result is consistent with several studies have indicated that females are more ethical than males and will report more violations of a policy (Akaah, 1989; Glover, Bumpus, Sharp & Munchus, 2002).

To further evaluate the impact the tobacco free policy may have on enrollment, Table 6 summarizes the survey results for freshman and transfer students compared with all other students. The opinions of freshmen and transfer students are extremely important in evaluating the enrollment impact as the policy change was made prior to their decision to enroll at the university. Of the 794 survey participants, 317 were either freshmen or transfer students as of the fall of 2007. As reported in Table 6, 58.6 percent or 186 students were aware of the new tobacco free policy when they applied for admissions; however, only 9.8 percent or 31 freshmen and transfers indicated that they chose to attend in part because they wanted to go to a tobacco free university. Although the percentage is small, in a small university, 31 additional students attending a university translates to substantial revenue, although we have no idea how many students were lost due to the policy because those students were not included in our survey.

A vast majority, 71.1 percent (225), said that the policy did not affect their decision to attend. One would naturally assume that these students would view a tobacco free policy more favorable given that they made their decision to attend the university after the policy change. The results tend to support this assumption. Freshman/transfer students were less likely to disagree with the policy, 19.2 percent (61) compared to 28 percent (131). However they were less willing to encourage their friends to attend a tobacco free campus, 19.1 percent (61) compared to 26.3 percent (123). These percentages may be an indication that more education needs to be provided regarding tobacco health hazards.

LIMITATIONS OF THE STUDY

This survey would be classified as a pilot demonstration project that could be replicated in other campuses nationally. Because the tobacco free policy was newly implemented in the fall of 2007 and the survey was performed in April 2008, the survey results may have limited impact because of the newness of the survey. To develop a baseline for further analysis, this study examined students' attitudes towards the tobacco free policy based on their smoking status, if it impacted their attending Lander University, if the smoking cessation program had any impact on their smoking, and if they would report violators of the policy. The survey also provided a

baseline of the number of students that actually use tobacco and if gender is a determining factor for tobacco use. A new survey will be repeated to further assess the tobacco free policy impact.

Table 6: Opinions of Freshmen and Transfer Students		
	Freshmen or Transfer Students	Other Students
Tobacco status		
User	23.5	21.7
Non-user	76.5	78.3
	$c^2=0.3662$	$P\text{-value} = 0.545$
Gender		
Male	32.8	35.9
Female	67.2	64.1
	$c^2=0.78$	$P\text{-value} = 0.376$
Aware of the tobacco free policy when you applied for admissions?		
Yes	58.6	
No	41.4	
If yes, did you attend in part because you wanted to go to a tobacco free university		
Yes	9.8	
No	19.1	
Did not affect my decision	71.1	
Support Tobacco Free Policy		
Yes	56.5	58.7
No	19.2	28
No opinion	24.3	13.3
	$c^2=19.06$	$P\text{-value} = 0.000$
Encourage Friends to Attend		
Yes	19.1	26.3
No	24.1	25.1
Does not matter	56.7	48.6
	$c^2=6.69$	$P\text{-value} = 0.035$
Considering transferring		
Yes	6.9	6.7
No	63.8	80
Does not matter	29.3	13.3
	$c^2=31.07$	$P\text{-value} = 0.000$
Willing to report violators		
Yes	16.4	20.6
No	83.6	79.4
	$c^2=2.16$	$P\text{-value} = 0.142$

In addition, these findings may not be applicable to campuses with an older student body so additional research could test the robustness of these results. Also, the institution surveyed is located in South Carolina which is located in a geographic region that is tobacco friendly. South

Carolina ranks 11th in the nation for smoking prevalence. In 2006, over 22% of SC adults smoke compared to the national average of 20% (Tobacco Use, 2010). Therefore the results may be biased against the tobacco free policy. It would be interesting to implement the survey in a broader geographic area with more diverse tobacco use rates.

CONCLUSION

It has been well documented that tobacco use is highly detrimental to one's health. Changing an addictive health behavior is very difficult. Tobacco use is common among college students nationwide. The four most common reasons that college students gave for their smoking were stress, less supervision, having more free time, and the number of their friends who smoke. Unfortunately, many students do not realize how addictive nicotine is. Smoking causes cancer, cardiovascular disease, and other problems (www.cdc.gov).

Most educational institutions have just started focusing on establishing tobacco free campuses. Smoking cigarettes is the number one preventable cause of death in the United States. Based on the literature review and Lander survey results, the following are recommendations to implement a tobacco free campus policy:

Prior to the implementation of the policy, develop an education program targeted to students, faculty and staff regarding the impact of tobacco on their health. This education may increase acceptance of the new campus policy.

Develop a smoking cessation program that includes student mentors. This type of program has positive results with students. Survey the smoking cessation program to determine if student usage has decreased.

Develop a campus marketing campaign regarding the tobacco free campus policy. This may be a marketing tool to encourage health conscious students to attend the university.

Ban the relationship between tobacco companies and students by disallowing tobacco advertisements on campus and disallowing any relationship between tobacco companies and student organizations. Tobacco companies have established huge marketing campaigns targeting this age group.

Survey the students on an annual basis to assess the impact of their tobacco use and to assess if their attitudes towards the policy have changed as a result of the tobacco free campus policy.

Develop an aggressive strategy to ensure that violators of the policy are reported. It is important the student population is aware that the policy will be enforced. If the students feel that there is limited enforcement, the policy's impact will be minimal.

Studying the tobacco free policies and smoking cessation programs impact on smoking levels of college students will provide data to educational administrators to develop policies that could ultimately save lives.

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APPENDIX 1: LANDER UNIVERSITY TOBACCO-FREE CAMPUS POLICY STATEMENT

Lander University is dedicated to providing a healthful, comfortable, and productive work and study environment for all faculty, staff and students. The Environmental Protection Agency (EPA) reports that Environmental Tobacco Smoke (ETS) is responsible for an estimated 53,000 deaths per year in nonsmokers. In addition, the 1986 US Surgeon General's Report entitled, *The Health Consequences on Involuntary Smoking*, concluded the following:

Involuntary smoking is a cause of disease, including lung cancer, in healthy nonsmokers. The simple separation of smokers and nonsmokers within the same airspace may reduce, but does not eliminate, the exposure of the nonsmoker to ETS.

In light of these findings, and as a part of a global wellness initiative that our university community is committed to, Lander University shall become entirely tobacco-free effective August 1, 2007.

1. Tobacco use will be prohibited on all university grounds both outdoors and indoors and within university owned or leased properties and vehicles. This includes all offices, hallways, waiting rooms, and restrooms, meeting rooms, community areas, parking lots and all other grounds and properties of Lander University. This policy is in effect 24 hours a day, seven days per week.
2. The sale of tobacco products is prohibited on Lander University campus, as is the delivery of any tobacco product by means of a delivery service of any kind.
3. The free distribution of any tobacco product on Lander University campus, including all clubs and organizations, is prohibited.
4. Lander University campus organizations are prohibited from accepting money or gifts from tobacco companies, or distributing free, reduced-price, or fully priced tobacco products (T-shirts, hats, etc.)
5. All tobacco advertising in public spaces on Lander University campus is strictly prohibited.
6. Tobacco advertisements are prohibited in all university-run publications.
7. All advertisements for employment and recruitment of students will denote that "Lander University is a tobacco-free campus."
8. Copies of this policy will be distributed to all students.
9. "Tobacco-Free" signs will be posted throughout the campus.
10. Lander University Student Wellness Center will provide tobacco cessation programs and offer resources for any student who is interested in discontinuing tobacco use.
11. This Tobacco Free Campus Policy can and will be enforced through issued citations by Lander University Police Department. Lander University's Wellness Center will provide consultation with a counselor and the Judicial Committee will insure fair and consistent treatment of the student.

First Offense: \$15.00 Fine

Second Offense: \$20.00 Fine. In addition to the fine the student is required to attend a mandatory consultation with a counselor from Lander University's Wellness Center. Failure to attend consultation within a 2-week time period will result in the student going before the Judicial Committee.

Third Offense: \$25.00 Fine. In addition to the fine the student is required to attend a mandatory consultation with a counselor from Lander University's Wellness Center. Failure to attend consultation within a 2-week time period will result in the student going before the Judicial Committee.

Fourth Offense: Student is required to go before the Judicial Committee.

The success of this policy depends upon the thoughtfulness, respect, and cooperation of everyone in assuring compliance with the policy. Smoking cessation programs and resources will be available in the Lander University Student Wellness Center. By complying with this policy, we will have a healthier university community and a

cleaner campus. All Lander University constituents need to be active in helping create a healthy campus by encouraging compliance from any individual who violates the policy.

The Office of Residential Life will inform all residential students of the policy in writing and will implement fines for violations inside and immediately outside of residence halls. The Office of Student Affairs will be responsible for student violations in all other indoor campus areas and grounds of Lander University. Offenders will be subject to specific disciplinary action as outlined in the Student Handbook Code of Conduct. Written violations must be reported to the Judicial Affairs' Officer submitted within twenty-four hours of the incident. Primary responsibility of written violations will fall under the jurisdiction of the Lander University Police Department and Residential Life Staff.

Complaints or disputes should be brought to the attention of the University employee who has immediate responsibility for the workspace, event, or residence, or to his/her supervisor. If satisfactory resolution is not reached, the President of the University should be consulted. The Office of Student Affairs is responsible for administering the policy to insure consistency and fairness for all Lander University students.

Revised August 2009

SELF-EFFICACY, THREAT, KNOWLEDGE AND INFORMATION RECEPTIVITY: EXPLORING PANDEMIC PREVENTION BEHAVIORS TO ENHANCE SOCIETAL WELFARE

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ABSTRACT

Disease prevention is important to societal welfare and sustainability, especially when a disease has reached pandemic proportions. The findings from a USA Internet survey show that self-efficacy, perceived threat, perceived knowledge quantity, and information receptivity influence self-reported health prevention behaviors. Hypotheses developed from the Health Belief Model are supported. The results will help guide development of effective public prevention marketing and communications for future widespread diseases.

INTRODUCTION

The USA Department of Health & Human Services has long suggested that the nation needs to shift from a treatment-oriented society to a prevention-oriented one in an effort to promote societal welfare and improve the quality of life of individuals (Moritsugu, 2007). Disease prevention is critical, as the death rate is 810.4 deaths per 100,000 people in the USA population (CDC Deaths & Mortality Data, 2006). The Centers for Disease Control and Prevention asserts that some of these deaths are associated with conditions that can be prevented (Moritsugu, 2007).

H1N1 STATUS AND RESEARCH RELEVANCE

In early August 2010, the World Health Organization (WHO) announced the end of the H1N1 (“swine flu”) pandemic (Dr. Chan for CNN, 08/10/10). As of October 10, 2010, the number of H1N1 confirmed cases in the USA was over 44,640 and associated deaths reached 10,837 cases, according to the Centers for Disease Control and Prevention (flucount.org Update, 10/10/2010). Worldwide there were 1,586,651 confirmed cases of H1N1 and 23,752 deaths (flucount.org Update, 10/10/2010). Given the fact that “countries are no longer required to test and report individual cases, the number of cases reported actually understates the real number of cases” (CDC International Situation Update, 09/20/09).

Even though we are moving out of the pandemic into the post-pandemic period, health experts continue to urge the public to be cautious. According to the World Health Organization's General Director, Dr. Chan, "The pandemic virus has not gone away...this virus is likely to continue to cause severe illnesses..." (Marwaan, IPS, 09/08/2010). Thus, effective public prevention information remains critical, even worldwide. With much long distance travel our globe is getting smaller and national contact is increasing; hence, prevention in every country is important. We focus here in the USA.

There is a need to understand and impact health care prevention intentions and behavior beyond just attitudes, as most individuals might not take the appropriate prevention measures, even if they are aware of the risks associated with lack of prevention behavior. In the situation of a worldwide pandemic, such as the one faced not long ago with the H1N1 (aka "Swine Flu") virus, developing this understanding is imperative. This article focuses on prevention messages that will motivate individuals to take the appropriate prevention measures before they get infected. The vehicle disease studied in this research is H1N1, however, the implications are applicable to many disease prevention situations.

H1N1 AND COMMUNICATIONS

Since late April, 2009, when the first few cases of H1N1 flu were detected, the world public has been bombarded with H1N1 prevention messages from numerous sources. However, the media have been trying to find a balance between raising public awareness about H1N1 and fostering/raising/creating panic (Denver News, 05/02/2009). The result has been dichotomized public opinion. Some believe H1N1 is endangering their lives, and others perceive it to be just media hype (Ripley, 2009; Twitter "Swine flu", 09/18/2009; Denver News, 05/02/2009; Vernazza, 2009), thus, some people are not taking the appropriate prevention measures. While there is strong evidence that H1N1 was more than just a mild disease as some also believe (Hedge, 2009), according to the World Health Organization's General Director, Dr. Chan, luck may have been with us: "This pandemic has turned out to have been much more fortunate than what we feared a little over a year ago...the virus did not mutate to a more lethal form...the H1N1 flu vaccine proved to be a good match and widespread resistance to the antiviral drug Tamiflu did not develop...this time around, we have been aided by pure good luck" (Dr. Chan for CNN, 08/10/10).

Therefore, even though there is a continuing debate regarding whether or not the H1N1 pandemic was real/serious/life-threatening, there is still a need to understand how to create effective public prevention messages, not only to raise awareness, but to also motivate the public to take preventative action. Prior research has also shown that there is a difference between raising awareness about a health-related topic and motivating individuals to take action (Glanz, Rimer & Viswanath, 2008). This suggests that even though the public might have been aware of the H1N1 pandemic, this awareness does not mean that the public was also motivated or

convinced to take action to prevent getting the H1N1 flu. Thus, this research investigates attitudes and behaviors towards H1N1, so as to explore impacts upon prevention behavior from Rosenstock's (1988) Health Belief Model (HBM). There is an apparent shortage of research into H1N1 flu prevention behavior.

This research begins to fill that gap by providing empirical information about the relationships between self-efficacy, perceived threat, perceived knowledge quantity, stored knowledge, information receptivity and self-reported health prevention behavior for a worldwide pandemic. We can begin to develop specific perspectives for building effective public prevention marketing and communications. Not only is H1N1 still infecting people (although at a decreasing rate), prevention remains important and H1N1 is unlikely to be the last worldwide pandemic.

THE HEALTH BELIEF MODEL (HBM)

There is substantial empirical support for the Health Belief Model (Janz & Becker, 1984; Broz & Karel, 2007). The Health Belief Model (HBM) was originally developed in the 1950s to explain why people fail to participate in health prevention programs, specifically for tuberculosis (Glanz, Rimer & Viswanath, 2008). Since then, the HBM has evolved to be applied to many other health-related prevention situations (cf., Glanz, Rimer & Viswanath, 2008), and the model has incorporated new constructs. For example, self-efficacy was incorporated into a revision of the original HBM (Rosenstock et al., 1988) to expand the 1950s model so as to better explain how to change habitually unhealthy behaviors, such as smoking and overeating. The self-efficacy construct has been found to be an empirically useful addition to the HBM model to assess likelihood of behavioral change across a variety of health-related contexts (cf., Glanz, Rimer & Viswanath, 2008).

Since the incorporation of self-efficacy, HBM predictions have been supported across many health-related domains, including obesity prevention, mammography testing, breast self-examination, condom usage, smoking, alcohol reduction, vaccination practices, and AIDS prevention behaviors (Glanz, Rimer & Viswanath, 2008; Conner & Norman, 1996). The HBM posits that in order for an individual to change his/her behavior, an individual must feel threatened, believe that a specific change in behavior will be beneficial taking account the cost of such change, and must feel that he/she is competent to implement the recommended health-related action (Rosenstock et al., 1988). We use the HBM to guide theoretically hypothesis development (versus a test of the HBM, per se). Our constructs include and extend those in the HBM.

COMPONENTS OF THE HBM

According to the HBM, *perceived susceptibility* refers to the individual's likelihood of getting a condition and *perceived severity* refers to how serious the condition is understood to be

by the individual. Both of these constructs together constitute the individual's level of *perceived threat*, which in turn has an effect on the individual's *likelihood of acting upon a recommended health-related action* (Glanz, Rimer & Viswanath, 2008). The HBM also suggests that modifying factors, such as strategies to activate the individual's readiness for taking action, called *cues to action* (e.g., education, symptoms & media information), as well as *socio-demographic variables* (e.g., age, sex, ethnicity, personality, socio-economics, individual knowledge), have an impact on the individual's level of perceived threat. We look at the direct impact of knowledge on prevention behavior, in combination with other HBM components, as per Champion (1987).

In addition, *perceived benefits*, *barriers*, and *self-efficacy* also have an effect on the individual's likelihood of acting upon a recommended health-related action (Glanz, Rimer & Viswanath, 2008). *Perceived benefits* refer to the individual's opinion on the advantages of acting on the recommended health-action, and *perceived barriers* refer to the individual's opinion on the disadvantages of acting on the recommended health-action. Finally, *perceived self-efficacy* was later added to the original HBM model, which refers to the individual's confidence level in his/her ability to take the recommended health-related action.

This research includes measurements to investigate all elements of the HBM for prevention behavior change as stand-alone constructs except perceived barriers and benefits.

Barriers and benefits are included in this research as part of the scored knowledge test. Thus, the HBM is used as a theoretical framework to guide variable selection and predictions. We include and extend the basic HBM constructs in our development of composite measures for this research.

PREVENTION BEHAVIOR INFLUENCE MODEL

The model to be tested is:

$$Y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \varepsilon_{ij}$$

Where: Y= likelihood of engaging in prevention behaviors

x₁ = perceived knowledge

x₂ = stored knowledge

x₃ = perceived threat

x₄ = perceived self-efficacy

x₅ = information receptivity

Table 1 depicts the measures used in this study, which correspond to elements of the HBM in our empirical model.

Table 1: Variables and Measures**Perceived Knowledge Scale -- 1=nothing, 7= a lot (Cronbach's Alpha = .89)**

In general, how much do you think you know about the H1N1 (swine) flu? How much do you think you know about protecting yourself from getting the H1N1 (swine) flu? How much do you think you know about the ways a person can and cannot get the H1N1 (swine) flu? Please rate your knowledge of the H1N1 (swine) flu compared to the average person.

Stored Knowledge Test (composite summing the number of scored right answers)

What is H1N1 (swine) flu?

Is H1N1 (swine) flu contagious?

Is H1N1 (swine) flu considered a world pandemic by health officials?

Which of the following best describes the signs and symptoms of H1N1 (swine) flu in people?

Is there a vaccine for the H1N1 (swine) flu now?

How does this new H1N1 (swine) flu spread?

Are there medicines to treat H1N1 (swine) flu after someone gets it?

According to official health recommendations, can a person protect himself or herself from contracting H1N1 (swine) flu by: (Yes/No answers)

Covering his/her nose and mouth with a tissue when he/she coughs or sneezes.

Avoiding close contact with people who have H1N1 (swine) flu.

Avoiding eating pork.

Avoiding touching your eyes, nose or mouth.

Taking at least 500ml of vitamin E both morning and night.

Washing his/her hands often with soap and water, especially after he/she coughs or sneezes.

Perceived Threat Scale (Cronbach's Alpha = .80)

If you were to feel sick and have flu like symptoms, to what extent would you be afraid that you had gotten the H1N1 (swine) flu? (1=not at all, 7=very)

I believe I am personally at risk for getting the H1N1 (swine) flu. (1=strongly disagree, 7=strongly agree)

As a threat to world health, how severe do you think the H1N1 (swine) flu is? (1=not at all, 7=very)

To what extent do you think you are at risk of getting the H1N1 (swine) flu? (1=not at all, 7=very)

I believe we are all at risk for getting the H1N1 (swine) flu. (1=strongly disagree, 7=strongly agree)

If you were to have the H1N1 (swine) flu how sick would you, personally, get? (1=not at all, 7=very)

Perceived Self-Efficacy Scale --1=not at all confident, 7=very confident (Cronbach's Alpha = .90)

How confident do you feel about your ability to make H1N1 (swine) flu prevention choices?

How confident do you feel you are about your ability to use your knowledge of H1N1 (swine) flu in making travel choices?

How confident do you feel about your ability to use your knowledge of H1N1 (swine) flu in making everyday activity choices?

Information Receptivity Scale --1=strongly disagree, 7=strongly agree (Cronbach's Alpha = .83)

I actively search for information about the H1N1 (swine) flu.

I intend to search actively most every day for information about the H1N1 (swine) flu.

I communicate a lot with other people about the H1N1 (swine) flu.

Prevention Behavior Scale --1=strongly disagree, 7=strongly agree (Cronbach's Alpha = .80)

It is important to me to do everything I reasonably can to avoid getting the H1N1 (swine) flu.

I actively seek information on how I can prevent myself from getting the H1N1 (swine) flu.

I am doing all that I know to do to prevent myself from getting the H1N1 (swine) flu.

I have changed my behavior to try to avoid getting the H1N1 (swine) flu.

According to the HBM, an important cue to action is media information. This study operationalized “media information” as information receptivity, which refers to how receptive individuals are to H1N1 information from sources including and beyond media, as well as how actively they seek H1N1 information.

Research on consumers’ prior knowledge shows there is more than one type of knowledge impacting consumers’ information search and decision-making (see variations among Brucks; 1985; Moorman, Diehl, Brinberg, & Kidwell, 2004; Frey & Foppa, 1986). We extend the HBM by investigating the effects of both stored knowledge (measured via a test score) and perceived knowledge, which goes beyond the knowledge portrayal constructs in the HBM. *Perceived knowledge* refers to how much individuals perceive themselves to know about a given topic (Brucks, 1985; Moorman, Diehl, Brinberg, & Kidwell, 2004). *Stored knowledge* refers to what individuals believe to be objectively true (Frey & Foppa, 1986) about a given topic, such as H1N1 prevention and is often measured as a knowledge test score (Bruck, 1985). The operationalization of other elements of the HBM are also presented in Table 1.

HYPOTHESES

It has been suggested that for risk messages, such as messages regarding the H1N1 virus, usually individuals process threat in a multiplicative way (Rosenstock et al, 1994) using both perceived susceptibility and severity of contracting a disease (i.e., perceived threat). Based on the HBM “multiplicative assessment” predictions for perceived threat we hypothesize:

H1 The higher the perceived threat of contracting the H1N1 flu, the higher the likelihood of engaging in prevention behavior.

According to Bandura (1994), an individual’s self-efficacy plays a crucial role on the individual’s likelihood to engage in prevention behavior. If an individual does not believe that he/she can carry out the behavior (i.e. wash hands more often), there is little motivation to engage in that behavior. Therefore, we hypothesize a direct relationship between self-efficacy and prevention behavior (e.g., if perceived self-efficacy is high, the likelihood of engaging in prevention behavior will also be high).

H2 The higher the perceived self-efficacy for the purpose of preventing H1N1 flu, the higher the likelihood of engaging in prevention behavior.

Information and knowledge should be positively associated with prevention behavior, because as information and knowledge increase the person has stronger tools to engage in prevention. They will know how. In a prior health care application (Golden and Stanaland, 2000), knowledge was also associated significantly with information receptivity, because knowledgeable consumers were more aware of what they did not know, thus more receptive to

information (Golden & Stanaland, 2000). Thus, due to the dynamic nature of information around the H1N1 topic, we posit that both knowledge and information receptivity demonstrate willingness to be exposed to prevention information.

The knowledge test was developed to tap into knowledge about readily available (push and pull) public information. We measured knowledge through a scored test as well as the respondent's self-perception of their amount of knowledge, both standard measures (see Brucks, 1985; Moorman, Diehl, Brinberg, & Kidwell, 2004). Our information receptivity construct goes beyond the HBM media information construct to include personal sources of information. Still, we expect a positive relationship to prevention behavior. Thus, we hypothesize that the greater the stored knowledge, perceived knowledge, and information receptivity, the higher the likelihood of engaging in prevention behaviors.

- H3 The higher the perceived knowledge of H1N1 flu, the higher the likelihood of engaging in prevention behaviors.*
- H4 The higher the stored knowledge of H1N1 flu, the higher the likelihood of engaging in prevention behaviors.*
- H5 The higher the information receptivity for the purpose of preventing H1N1 flu, the higher the likelihood of engaging in prevention behaviors.*

METHODOLOGY

A self-administered Internet questionnaire was developed and pretested. Two pretests were conducted among a convenience sample of students and professors (total n=29) at a large USA university shortly before the final instrument was fielded. Nineteen participants were students between the ages of 18 to 24 and the rest were professors 35 to 65 years old. Student and professor administrations were separate. Both groups were debriefed after the administration of the questionnaire and participated in an informal discussion that provided further insights into the research topic. The pretests revealed no problems with the survey instrument, so no changes were made to the questionnaire as a result of the pretests.

The scaled questions used in the pretest and final instrument are described in Table 1. All constructs, except for the stored knowledge test, were measured on a 7-point bipolar adjective scale, with the extremes labeled as shown in Table 1. The Golden Semantic Differential Scale (Golden, & Albaum, 1984; Golden, & Zimmer, 1986; Zatarain, et al., 1986; Golden, Albaum, & Zimmer, 1987; Albaum, et al., 1988; Golden, 1990; Albaum, & Golden, 1991; Golden et al., 1992) format was used whereby the scale appears before the applicable series of questions and the respondent indicates the number from the scale that represents their answer. As also shown in Table 1, all scales were highly reliable with Cronbach's Alpha at or greater than .80.

A confirmatory factor analysis was conducted to verify the validity of each scale for its component questions. The Bartlett’s Test of Sphericity was significant within .001 across all scales. In addition the change in Eigenvalue from the first to the second factor extracted for each scale was substantial clearly indicated a one factor solution for each scale. Hence, via the reliability and validity analyses, each of the scales used in the research is psychometrically sound.

Internet data collection was conducted during August 2009, using email addresses rented from an online Internet consumer panel in the USA. Data collection took place during the first wave of the pandemic period. The sample frame consisted of a sub-set of qualified participants in the Internet survey panel selected at random by the company administering the panel (Qualtrics). Potential respondents were invited to fill out the survey via email (identities and emails remain confidential as they are owned by panel company compiling them—the researcher “rents” the emails for survey purposes). We specified a sample frame from the general USA public over 18 years of age with a range of ages and ranging other demographics (including balancing of sex). As is typical in Internet surveys of this type, data collection is terminated when the purchased number of respondents have completed the survey (here n=430).

Variables	Mean	SD	Range
Perceived Knowledge (1-7)	3.96	1.32	1-7
Stored Knowledge Test (1-13)	10.45	1.61	3-13
Perceived Threat (1-7)	3.87	1.12	1-7
Perceived Self-Efficacy (1-7)	4.99	1.19	1-7
Information Receptivity (1-7)	2.48	1.57	1-7
Prevention Behavior (1-7)	3.68	1.51	1-7

The final sample consisted of 429 participants of which 223 (52%) were male and 206 (48%) were female. A little less than half of the participants (43.4%) were between the ages of 35 to 54, followed by 28.4% who were 55 years old or older, and the rest 28.2% were between the ages of 18 to 34. Thus, the sample consisted of a cross-section of the USA (on sex and age) and were geographically distributed across the nation (as reported by the national panel purchased). Table 2 shows the mean scores, standard deviations and the range of each scale. The sample was high in self-efficacy, on average, and the sample’s knowledge test score was 80.38%. They were low on information receptivity.

ANALYSIS AND RESULTS

Preliminary analyses were performed to ensure there was no violation of the assumptions of model linearity. The standard colinearity tests showed no violations of this assumption. There

were no values above 10 on the VIF (the inverse of the tolerance), and all were below 1.5. The tolerance ($1 - R^2$ for each variable) was higher than 0.67, which also shows there is no colinearity between the independent variables. The over-all linear OLS model was statistically significant at $p \leq .01$ with $R^2 = .455$. Additional results are shown in Table 3.

Independent Variables	Standard Error	Beta	t	p
(Constant)	.422		-.91	.36
Perceived Threat	.053	.353	8.95	.00
Perceived Knowledge	.049	.083	1.93	.05
Information Receptivity	.038	.390	9.92	.00
Stored Knowledge Test	.035	.019	.50	.61
Perceived Self-Efficacy	.052	.119	2.89	.00

^a $R^2 = .455$, Std.Error=1.117, $F(5,423) = 70.757$, $p < .01$

The results of this research suggest that an individual's perceived knowledge, perceived threat, perceived self-efficacy, and information receptivity have a strong impact on the likelihood of engaging in H1N1 prevention behaviors. More specifically, the higher an individual's perceived knowledge, perceived threat, perceived self-efficacy and information receptivity, the higher the likelihood he or she will engage in H1N1 prevention behaviors. These results support hypotheses H1, H2, H3, and H5.

In order to confirm that H1, H2, H3, and H5 were still supported without the insignificant stored knowledge variable, we re-run the regression without the stored knowledge test score variable, which yielded the following results: $R^2 = .455$, Std. Error=1.116, $F(4,424) = 88.539$, $p < .01$. The basic results across variables and the $p < .01$ explained variance did not change, therefore H1, H2, H3, and H5 are supported for this empirical investigation.

These findings are congruent with predictions from the HBM and suggests that health communicators should design H1N1 prevention messages, that increase the perceived risks communicated by H1N1 messages and the message receiver's perceived efficacy related to the prevention behavior recommended by the H1N1 message. Also, these findings suggest that the more receptive to H1N1 information an individual is, the more likely it is that he/she will engage in H1N1 prevention behaviors. According to the HBM, "cues to action", such as information receptivity, signal individual's readiness to act, thus it is more likely that the individual will take appropriate prevention measures. Further, individuals with higher information receptivity might be more likely to engage in prevention behaviors, because their media exposure has provided them with information and directions on how to engage in prevention behaviors and what kinds of prevention behaviors they should engage in. Finally, as an individual's perceived knowledge of the H1N1 flu increases, so does the likelihood of engaging in prevention behaviors. These

results might be related to the other three significant factors: perceived threat, perceived self-efficacy and information receptivity. All these factors in turn contribute to the increased likelihood of engaging in H1N1 prevention behaviors.

H4 was not supported, as the stored knowledge test was not statistically associated with prevention behavior. Thus, retention of actual knowledge being disseminated publicly does not appear to impact prevention behavior. Rather, self-perceptions of knowledge are impacting behavior. Other researchers who have found a relationship using a knowledge test score were associating information search with test score knowledge and not prevention behavior (e.g., Brucks, 1985; Moorman, Diehl, Brinberg, & Kidwell, 2004). This is the first study to look at the association between a knowledge test score and prevention *behavior*. More research is needed to validate our results for other contexts and situations.

CONCLUSIONS AND IMPLICATIONS

This research makes contributions to the literature in several ways. First, this is the first academic study investigating perceptions, attitudes, and behavior around H1N1 *prevention behavior*. Second, this research developed statistically reliable scales for perceived threat, perceived knowledge, perceived self-efficacy, information receptivity and prevention behaviors, associated with H1N1 flu. The HBM is likely to be a very productive framework for predictions about the H1N1 flu and for the prevention of future pandemics. Having strong measures of the HBM constructs will be useful to future researchers investigating the effectiveness of prevention messages. Clearly, the HBM constructs are empirically important. Third, this research also developed a statistically reliable test for H1N1 stored knowledge, based on CDC and official public health information (at the time of data collection) that might also be useful for future research.

All conclusions drawn from this research are restricted to the timeframe of data collection, nature of the sample and generalizations cannot be made beyond those boundaries. Still, the conclusions from this study do provide implications for motivating prevention behavior for H1N1 and other diseases.

The results imply that the use of threat appeals can be more effective than other types of appeals in motivating individuals to engage in H1N1 prevention behaviors, as results suggest that the higher the perceived threat of the H1N1 flu, the higher is the likelihood of engaging in H1N1 prevention behaviors. However, health communicators should make sure the H1N1 messages are not perceived as media hype, by making threat claims that are extremely magnified. Future research regarding the use of threat appeals for H1N1 prevention campaigns is vital.

Investigating Witte's (1992) Extended Parallel Processing Model, which focuses on the use of fear appeals to promote health behaviors, may prove useful to evaluate H1N1 flu prevention messages and make further recommendations for the prevention of future pandemics. Caution is warranted, however, as counter-attitudinal messages might not get attended to,

especially with those perceiving a disease's severity as "media hype". It will be important to design messages that penetrate counter-attitudinal barriers. Future research into the specifics of actual messaging is needed when a disease is "highly controversial".

H1N1 messages should also be directed to the receiver's perceived efficacy in carrying out the recommended prevention behavior. Perceived self-efficacy is important to following prevention behavior guidelines. Consistency and repetition of H1N1 prevention messages are two key concepts here. Health communicators can try to increase the perceived self-efficacy of the recommended prevention behaviors by providing consistent messages across media and exposing individuals repeatedly to the same messages regarding how to carry out the prevention behavior suggested. Likewise, messages stimulating word-of-mouth may be very important, given the enhanced credibility of information from professionals and knowledgeable friends or family. Even though individuals might not feel capable of acting upon the recommended prevention behavior at first, they may feel more capable in acting upon the recommended prevention behavior after multiple exposures to the same message and/or having a role model for prevention behavior. Messages should show how an individual can take the appropriate measures to protect himself/herself from contracting the H1N1 virus and motivate sharing that information with others. In marketing terms: *Make it easy for the public to act* (by giving prevention information from a wide variety of sources and a consistent message that will increase individuals' perceived self-efficacy).

Moreover, the results suggest that the higher the information receptivity, the higher the likelihood of engaging in prevention behaviors. This result suggests that information-seekers, who tend to be more receptive towards information, are also opinion leaders for others, filtering information to those less information attendant. This implies that health communicators should also try to identify these opinion leaders in order to increase the reach of the H1N1 prevention messages. Future research should focus on how health communicators can identify these opinion leaders and how to reach them in a way that will motivate them to spread the prevention message. It is also imperative for health officials to create integrated communication messages for H1N1 prevention behaviors in order to increase the reach of this kind of information and to provide the public with a consistent message that will not be perceived as media hype.

It is also important to know that information receptivity, perceived threat, perceived self-efficacy and perceived knowledge are relevant to the "bigger picture" of prevention behaviors, in case of a future worldwide pandemic. Health prevention messages are imperative. Future research is needed to help create these as effectively as possible, in an effort to enhance societal welfare.

This study focused on the perceptions, attitudes, and behaviors toward the H1N1 virus in the USA. Culture is highly likely to influence prevention behaviors. Cross-cultural investigations are very important for this research area. The same is true for subcultural differences within any nation (e.g., Mexican-Americans may respond differently than Asian-Americans). The need to understand and impact health care prevention intentions and behavior is important no matter how

localized or widespread a disease may be. In the situation of a worldwide pandemic, developing this understanding is more difficult and complex, given the cultural and geopolitical boundaries that must be transcended. Future studies should examine pandemic health prevention across countries in order to enhance societal welfare worldwide, and Internet surveys are an excellent vehicle for transcending geographical boundaries within or across nations.

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A PROPOSED MODEL FOR THE ROLE OF PHYSICIAN PEER MENTORING IN IMPROVING PHYSICIAN COMMUNICATION AND PATIENT SATISFACTION

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ABSTRACT

Physician peer mentoring has the potential to provide improved physician job satisfaction while increasing patient satisfaction and improving patient health outcomes. Peer mentoring also has the potential to be more effective than traditional training methods for improving physicians' abilities to manage relationships with patients, including communication and interpersonal skills. By pairing physicians who are effective communicators with less effective ones, peer mentoring provides a physician who can share knowledge about managing patient relationships. This paper adds to the mentoring literature by exploring the role of peer mentoring for physicians. This paper also adds to the doctor-patient relationship literature by suggesting that physician peer mentoring may be an effective tool for improving doctors' relationships with their patients, thereby resulting in more satisfied and healthy patients. Finally, the paper lays out an agenda for future research on the impact of peer mentoring on effective physician communication and patient satisfaction.

INTRODUCTION

Mentoring is effective—mentees experience significantly better career outcomes than those who are not mentored (Byrne, Dik & Chiaburu, 2008). The changing workplace and nature of work has made it more difficult for employees to find traditional mentors (with a senior manager and a junior employee). This has resulted in a call for more research on alternatives to traditional mentoring that can provide positive career outcomes (Allen & Finkelstein, 2003). Peer mentoring is one alternative that shows promise for providing not only longer-term career benefits but also more immediate benefits to the employee—including knowledge sharing (Bryant, 2005), socialization (Allen, McManus & Russell, 1999), and psychosocial support (Ensher, Thomas & Murphy, 2001). While the management literature has well established the benefits of mentoring and peer mentoring, mentoring in the healthcare context has been paid little attention. In particular, physician mentoring has been little researched (Hoover, 2005).

Physician peer mentoring has the potential to provide improved physician job satisfaction while increasing patient satisfaction and improving patient health outcomes. Peer mentoring also has the potential to be more effective than traditional training methods for improving physicians' ability to manage relationships with patients, including communication and interpersonal skills. A recent study found that intensive training on communication skills could improve medical students' ability to communicate effectively with patients (Yedida, Gillespie, Kachur, Schwartz, Ockene, Chepaitis, et al., 2003). This indicates that physicians can learn skills to become more effective communicators if they have the proper training and motivation. By pairing physicians who are effective communicators with less effective ones, peer mentoring provides a physician who can share knowledge about managing patient relationships. Peer mentoring provides relevant, "just in time" training over a long period, in contrast to the typical week-long courses, which have been shown to be less effective (Cheraghi-Sohi & Bower, 2008). A peer also has the potential to motivate a fellow physician to improve his/her communication skills by exerting referent and expert power (French & Raven, 1959). This paper adds to the mentoring literature by exploring the role of peer mentoring for physicians. It adds to the doctor-patient relationship literature by suggesting that physician peer mentoring may be an effective tool for improving doctors' relationships with their patients, thereby resulting in more satisfied and healthy patients. It lays out an agenda for future research on the impact of peer mentoring on effective physician communication, patient satisfaction, and patient health outcomes.

PHYSICIAN MENTORING OVERVIEW

Physician mentoring and peer mentoring fit within the larger context of mentoring. Physician mentoring is not a new concept; the medical training model that includes internships and residencies has relied on mentoring. However, mentoring in this context is usually restricted to the appropriate diagnoses of medical symptoms and the treatment of those conditions. While all patients certainly want physicians to be well trained in the diagnoses and treatment of medical conditions, this focus leaves out the critical skill of interpersonal relationships with the patient in the process of diagnosis and treatment. Many physicians develop the ability to relate effectively to patients, even if developing this skill was not explicitly part of their medical training. The mentoring model applied early in a physician's training is largely unused in the later stages of a physician's career. Unfortunately, this means that a highly effectively tool for transferring knowledge and skills gathered from years of experience from one physician to another about how to relate to patients, is often underutilized.

Mentoring

The mentoring literature has found that mentored employees have significantly better career outcomes than non-mentored employees (Byrne et al., 2008; Kammeyer-Mueller & Judge,

2008). Mentoring researchers have examined several factors that impact the forming and effectiveness of mentoring including: (a) formal versus inform mentoring programs (Allen, Eby & Lentz, 2006); (b) gender (Dreher & Ash, 1990; Ragins & Scandura, 1994; Fagenson, 1989 Vincent & Seymour, 1995); (c) racial diversity (Dreher & Cox, 1996; Feldman, Folks & Turnley, 1999; Kaplan, 1994); and (d) personality (Turban & Dougherty, 1994; Noe, 1988; Fagenson).

These studies suggest that although certain groups of individuals may have more difficulty finding mentors, most are able to find mentors and benefit from the relationship. The mentors, as well as the mentees, benefit from the relationship, including benefits such as career attainment and success, increased knowledge and information sharing and increased loyalty to the organization. Researchers have found that the primary outcomes for mentees have been career attainment and success (Fagenson, 1989; Kram, 1985; Hunt & Michael, 1983; Scandura, 1992; Turban & Dougherty, 1994; Scandura, Tejada, Werther & Lankau, 1996). A secondary outcome of mentoring—increased knowledge and information—has recently emerged (Mullen, 1994; Mullen & Noe, 1999). Knowledge sharing may grow in importance for the mentoring relationship as the rate of technological change continues to escalate and executives are in need of help to stay current with the changes. Bell (1996) argued that employees who have mentors are also more loyal to the organization. Although the work setting for physicians is different than many other organizations, there is increasing evidence that physicians would benefit from mentoring and peer mentoring relationships

Peer Mentoring

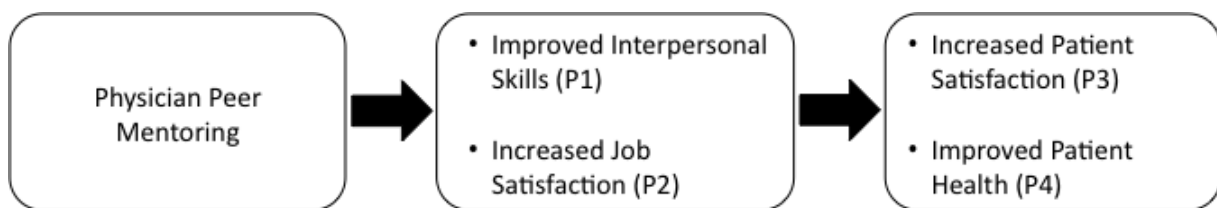
Within the larger context of mentoring are alternatives to traditional mentoring relationships, including peer mentoring. Peer mentoring is an intentional one-on-one relationship between employees at the same or similar lateral level in the firm involving a more experienced employee providing support and teaching new knowledge and skills to a less experienced employee (Ensher et al., 2001). Peer mentoring is becoming increasingly common in organizations and is receiving more attention from scholars because it may offer some unique advantages over traditional mentoring relationships (Allen et al., 1999 Eby, 1997; Ensher et al.). Peers can provide the same kinds of psychosocial and vocational support as traditional mentors, but they are uniquely qualified to provide job-related and technical knowledge (Bryant, 2005; Eby; Ensher et al.; Files, Blair, Mayer & Ko, 2008; Kram & Isabella, 1985; Young & Perrewé, 2000). The next section of the paper examines how peer mentoring can help physicians share knowledge and become more effective and satisfied at their jobs.

Physician Peer Mentoring

Though limited, currently there is a growing body of literature on physician mentoring (Berk, Berg, Mortimer, Walton-Moss & Yeo, 2010; Carey & Weissman, 2010; Davis &

Nakamura, 2010; Jackson, Palepu, Szalacha, Caswell, Carr & Inui, 2003; Palepu, Friedman, Barnett, 2003; Ramanan, Phillips, Davis, Silen & Reede, 2002; Williams, Weinman & Dale, 1998; Zeind, Zdanowicz, Parkhurst, King & Wizwer, 2005). There are also articles that examine career paths of physicians and include mentoring in their analysis (e.g., Lorber & Ecker, 1983). Even though the work setting for physicians is different from other organizations, physicians would still benefit from mentoring and peer mentoring relationships. Recent research suggests this is the case. Files, et al. (2008) found that women who were formally matched with a female peer mentor experienced more success in publishing and greater satisfaction with their work. Hoover (2005) argues that, based on his experience and observations, mentoring is critical to success as an academic surgeon—perhaps the most important factor next to credentials. Mentoring takes place in person and within the medical specialty if possible. Ramanan, et al. conducted interviews of 700 Harvard faculty and found that those faculty who reported a good mentoring relationship identified the following beneficial characteristics of the relationship: (a) career advice, (b) research advice, (c) improved communication skills, (d) not abusing power, (e) maintained close personal contact, and (f) helped mentee build professional networks. Steven, Oxley, and Fleming (2008) found that the primary benefits of a mentoring relationship for physicians were professional practice, personal well-being, and personal development. These studies suggest that mentors can help physicians develop professional skills including communication skills, which is consistent with the management mentoring literature. The next section addressed how peer mentoring can facilitate knowledge sharing and develop communication skills.

Figure 1
Physician Peer Mentoring Model



PHYSICIAN PEER MENTORING AND PHYSICIAN INTERPERSONAL SKILLS

Peer mentoring has the potential to improve physicians' interpersonal skills. Peer mentoring provides a mechanism for sharing job-related knowledge as well providing psychosocial support (Allen et al., 1999; Eby, 1997; Ensher et al., 2001; Files et al., 2008). Peer mentoring facilitates the reciprocal sharing of knowledge between mentors and mentees (Bryant,

2005; Ensher et al.; Kram, 1985; Young & Perrewé, 2000). Much of the knowledge that peer mentors possess is tacit, learned from personal experience and from interacting with other employees. Most of the taken-for-granted knowledge of the peer mentor is not recorded in any database, procedure manual, or formal training program (Swap, Leonard, Shields & Abrams, 2001). Physician knowledge about interacting with patients would certainly fall into this category. Physicians develop skills to build rapport with patients, to conduct medical histories effectively, and communicate well with patients. Some of this knowledge has been studied and made explicit, while much remains in tacit knowledge form. Some medical residencies involve a formal mentoring program, but less than half in internal medicine had any kind of formal mentoring program and most were poorly structured, lacked evaluation, and were loosely monitored (Castigioni, Bellini & Shea, 2004).

PSYCHOSOCIAL PROCESSES

Psychosocial processes are involved in creating and sharing knowledge through peer mentoring. Peer mentoring provides an opportunity to externalize knowledge by turning tacit knowledge into explicit knowledge (Nonaka, 1994). This is a powerful form of knowledge creation and provides a key source of innovation and new ideas in firms. Peer mentors share externalized knowledge when they take time to organize their thoughts, write them down, and make explicit what they understand implicitly. When the mentee understands the concept the mentor is sharing, the mentee engages in internalization and converts explicit knowledge to tacit knowledge (Swap et al., 2001). Internalization is closely related to learning by doing (Nonaka), which the mentee does while being mentored (Swap et al.). Swap, et al. state that internalization occurs when a more experienced peer helps a less experienced one “interpret events, understand technology and business processes, and identify the values and norms of an organization” (p. 98).

In many circumstances, employees bypass the externalization and internalization processes and share knowledge by demonstrating how to do a particular procedure or solve a particular problem through the socialization (tacit to tacit knowledge) process (Nonaka, 1994; Swap et al., 2001). Nonaka argues that this personal contact between employees is essential to creating new knowledge, because the more experienced physicians may be the only ones in the organization who understand how to effectively communicate with patients. Peer mentoring accelerates this process by helping mentors organize their thoughts and share relevant, appropriate knowledge in ways the mentees can learn from (Swap et al.).

Physician peer mentors are in a unique position to provide mentoring because they are working side by side with other doctors and share education backgrounds and experiences. Peer mentors provide psychosocial support and share knowledge with their mentees (See Figure 1). Physicians use a mentoring-like process in their internship and residency training to develop their medical knowledge and skills—some even participate in formal mentoring programs

(Castiglioni et al., 2004). This process can be extended further into a physician's career. Peer mentoring focused on improving patient relationships and patient relationship management holds promise for improving physicians' ability to serve patients. Physicians who receive high patient satisfaction ratings can be informally paired with physicians with lower patient satisfaction ratings. Peer mentors can provide insights, techniques, and methods they use to communicate effectively with patients (Eby, 1997; Ensher et al., 2001; Kram & Isabella, 1985; Young & Perrewé, 2000). Physicians may have different approaches to communicating with patients, but they can share what has been effective for them. Mentoring might be even more effective if the struggling doctor seeks out a mentor on their own to help them with patient communication.

Recent research suggests that training on communication skills can improve medical students' ability to communicate effectively with patients (Yedida et al., 2003). Their communication skills can be improved upon over time. However, the typical short (one-week) courses that physicians often participate in are not very effective at improving physician communication skills (Cherg-Sohi & Bower, 2008). Peer mentoring can fill this gap by providing a long-term mentoring relationship that allows for knowledge sharing on patient relationships and communication. Peer mentors can utilize their unique position to motivate their peers to improve their communication skills. In particular, because mentors are respected physicians in the organization who have relationships with the other practitioners, they can exercise referent power and expert power to motivate the mentored physicians (French & Raven, 1959). This leads to the following proposition:

Proposition 1: Peer mentoring improves physicians' interpersonal skills (concern for patient, communication)

PEER MENTORING AND PHYSICIAN JOB SATISFACTION

Recent mentoring research has found that both the mentor and the mentee experience significant benefits from the mentoring relationship. One interesting finding is that both experience greater job satisfaction (Ragins & Scandura, 1994). This is likely the result of several positive outcomes from mentoring: (a) mentors receive increased social recognition from mentoring (Kram, 1985; Ragins & Scandura, 1994); (b) researchers have recently found that mentors receive important knowledge and information about the job, the organization and the culture from the mentoring relationship (Kram, 1985; Ragins & Scandura; Bokeno & Gantt, 2000); and (c) knowledge sharing may grow in importance for the mentoring relationship as the rate of technological change continues to escalate and executives are in need of help to stay current with the changes. One could reasonable expect that physicians who participate in a peer mentoring relationship would experience greater job satisfaction because of increased status and sharing of knowledge (Castiglioni, et al., 2004). This leads to the following proposition:

Proposition 2: Physicians who participate in a mentoring relationship will experience greater job satisfaction than those who do not.

PHYSICIAN PEER MENTORING AND PATIENT SATISFACTION

Peer mentoring has the potential to help physicians improve their interpersonal skills, including their ability to communicate effectively with patients. Recent research provides solid support for effective physician communication skills improving patient satisfaction and health (Yedida et al., 2003). Yedida et al., summarized the impact of effective physician communication with patients: (a) improved patient satisfaction, (b) decreased patient worry, (c) increased information retention, (d) more comprehensive medical histories, (e) increased patient compliance with treatment plans, (f) decreased patient symptoms, (g) improved physiological outcomes, (h) increased patient functional status, and (i) decreased malpractice claims. These results clearly support the value of effective physician communication. The next section reviews factors that influence patient satisfaction and patient communication.

PATIENT SATISFACTION AND PATIENT COMMUNICATION

Researchers have identified several factors that seem to predict patient satisfaction. Jackson, Chamberlin, and Kroenke (2001) conducted a study with 500 adults in a medical clinic. Patients were surveyed before, immediately after, two weeks after, and three months after their visit. The survey collected patient symptoms, mental disorders, symptom resolution, unmet expectations, and satisfaction. The authors found that unmet expectations at all points in time significantly decreased satisfaction with care. Immediately after the visit, receiving an explanation of the likely causes, as well as the expected duration of symptoms, predicted patient satisfaction with their care. Not surprisingly, at two weeks and three months after the visit, experiencing improvement in symptoms increased satisfaction, while follow-up visit for the same symptom decreased satisfaction.

Jackson, et al. (2001) found that immediately after the visit, elements of doctor-patient communication predicted satisfaction (for example, receiving an explanation of the symptom cause, likely duration, and lack of unmet expectations). Consistent with this finding, Levinson, Roter, Mullooly, Dull, and Frankel (1997) found that surgeons with better communication skills had fewer malpractice claims. Like and Zyzanski (1987) found that meeting patients' requests increased patients' satisfaction with the encounter and accounted for 19% of the variance in patient satisfaction. This suggests that clearly understanding patients' expectations, needs, and actively trying to meet those needs, can significantly increase patient satisfaction. Similarly, Joos, Hickam, and Borders (1993) found that how frequently physicians met their patients' desires for services were positively associated with patient satisfaction. Patients with the most

unmet desires for services, especially services related to information, were significantly less satisfied with their physicians than were those with fewer unmet needs.

Levinson, et al. (1999) argue that communicating clearly with patients can reduce conflict and increase patient satisfaction. Levinson, Gorawara, Dueck, Egener, Kao, Kerr, et al., (1999) suggests that physicians can employ several communication strategies to improve the flow of information and reduce conflict: (a) listen to the patients and understand their needs and concerns, (b) express empathy, (c) encourage patients to take an active role in discussing options in care, and (d) negotiate differences of opinion. By employing these strategies, physicians can increase the flow of information between themselves and patients and increase patients' satisfaction with their care.

Kane, Maciejewski, and Finch (1997) administered surveys to 2,116 patients before surgery and six months after surgery to assess the relationship between patient satisfaction with care (quality of care, hospital care, and physician time) and clinical outcomes. The researchers found a significant relationship between health outcomes and patient satisfaction. Interestingly, they also found that patients tend to focus on their present state of health when determining satisfaction, rather than the improvement in health they have enjoyed.

Speedling and Rose (1985) suggest that physicians need to do more than simply strive for patient satisfaction. Physicians should encourage patients to take an active role in their care and participate more actively in the conversation about their care. Patients need to provide their preferences and perspectives during the conversation with the physician. The authors suggest that patient participation in the medical decision making process will improve healthcare outcomes and is a feasible goal.

While the research on patient satisfaction is still developing, and there is a need for additional research, there are several emerging patterns. Patients are more satisfied when they are listened to, when their expectations are met, and when the care they have received improves their health. Physicians can better understand their patients' needs and expectations by improving their ability to communicate with patients. As a result, patients will be more satisfied and have better health outcomes. This leads to the following propositions:

Proposition 3: Mentored physicians with improved patient communication skills will increase patient satisfaction.

Proposition 4: Mentored physicians with improved patient communication skills will improve patient health outcomes.

IMPLEMENTING PEER MENTORING

There are several practical and organizational issues surrounding the use and implementation of peer mentoring for physicians. Clearly, peer mentoring requires several key organizational factors. The health organization (hospital, clinic, etc.) needs to be large enough to

provide an adequate pool of potential mentors. The organization also needs to track patient satisfaction measures for each physician in order to track whether mentoring makes a difference in improving patient satisfaction. Finally, setting up a mentoring process needs to recognize that physicians are very busy and have limited time for non-patient related work. Physicians are also likely to be resistant to having a mentor thrust upon them.

Physicians' perceptions and attitudes toward mentoring could influence the effectiveness of mentoring. Personality traits of mentors and mentees may affect the effectiveness of mentoring for transferring knowledge about patient communication. It is also likely that physicians will be resistant to receiving mentoring. Therefore, informal mentoring that is combined with training on relevant topics might overcome this resistance. The mentors would need to make sure the mentoring and training is not threatening and perceived as remedial. Mentoring could be couched with other learning—such as additional training in the mentor's clinical specialty (for example, women's health issues, or sports medicine). Administrators would also need to address motivation issues for mentors and provide incentives—even small ones like some free time and buying lunch for mentors and mentees). The research on mentoring suggests that mentors are often rejuvenated by the mentoring relationship and discover new skills and knowledge in the process. Overcoming the initial barriers to beginning mentoring relationships may be the biggest obstacle. Research suggests that once the mentoring relationships are under way, if the relationship is a positive one for both parties, it will continue without much incentive or involvement from administrators.

Health care organizations can take several practical steps to implement a peer mentoring system. The first critical step is to provide public support for the program from the top executives in the organization. This could involve announcing the initiative at organization wide meetings, creating articles for the Website or newsletter and asking top managers to discuss the peer mentoring initiative at departmental and group meetings. Following the marketing of the program, a targeted effort needs to be conducted to recruit physicians to participate in the peer mentoring program. Physicians could be asked to volunteer and could also be nominated by peers or supervisors. Finally, a small work group should be formed to review the employees that would like to participate in the program and match them up based on interests and potential effectiveness of the match. Finally, the peer mentoring work group should conduct periodic evaluations of the peer mentoring matches to assess how things are going and suggest improvements for future matches. Publicizing the successes of the early matches is critical to the long-term acceptance and effectiveness of the program.

SUGGESTIONS FOR FUTURE RESEARCH

Future research should continue to explore the benefits and challenges of physician peer mentoring. Future studies should also provide empirical examinations of the relationship between physician peer mentoring and effective communication. Researchers could examine

effective communication measures in a healthcare organization that implements a peer mentoring program, or at least provides peer mentors to physicians that would like to take advantage of them. Effective communication measures for physicians that receive peer mentoring could be compared to those practitioners that are not in a mentoring relationship to see if there is a significant difference. Future research could also empirically examine whether mentored physicians are more satisfied with their own performance than those who do not receive mentoring. Finally, researchers could examine whether mentored physicians' patients are more satisfied with their healthcare and if they have better health outcomes.

Studies could be conducted in a variety of healthcare organizations to determine differences in the effectiveness of peer mentoring in facilitating more effective communication between physicians and patients. Large hospitals with extensive physician staffs and specialized areas would provide a potentially useful setting. Smaller hospitals, clinics and even larger physicians private practices would provide different settings and results. Multiple methods could be employed to examine these questions. Qualitative interviews with physicians about their communications with patients would provide fertile ground for developing survey questions. These questions could then be implemented in a survey of physicians and patients on the effectiveness of communication. Data should be collected for physicians participating in the mentoring programs and those that are not. Effort should be taken to identify physicians with similar characteristics in both the mentored and non-mentored groups (e.g., patient satisfaction, gender, age, specialty, etc.).

Mentoring is an integral part of physician training during medical school and residencies. However, its use for further career development and skills improvement in clinical settings has been understudied and underutilized. Future researchers should examine organizations that make intentional efforts to foster mentoring through formal and informal means. By qualitatively examining the experience of physicians and patients and then building on this base with quantitative studies, researchers can better understand the effectiveness of peer mentoring in improving physician communication skills as well as other interpersonal skills.

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PHYSICIANS, DEFENSIVE MEDICINE AND ETHICS

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ABSTRACT

Medical malpractice is most often defined as professional negligence by act or omission by a provider of health services that deviates from acceptable norms with resultant damages to the plaintiff. Physicians are faced with an epidemic of medical malpractice law suits that has forced them to change the way that they do business. In order to protect themselves from litigation, physicians often incorporate a significant dimension of defensive medicine into their practice.

According to Spath (2009) defensive medicine consists of diagnostic or therapeutic interventions that are primarily used by the physician as protection against future medical malpractice law suits by the patient. Many of these interventions are medically unnecessary interventions carried out in the physician's office and paid for by patients or third party payers even though they have limited if any real value. In fact there may be no bona fide medical reason for the intervention other than fear of a potential lawsuit at a later date.

Some of these additional procedures and return visits to the doctor including writing prescriptions have become a significant source of income to the physician practicing defensive medicine. They drive up health care costs, may cause needless harm to the patient, and quite often are unnecessary. This paper will attempt to explore whether or not the practice of defensive medicine is also an unethical physician behavior.

INTRODUCTION

The cost of delivering health care services in the United States continues to rise every year consuming an ever higher percent of our Gross Domestic Product. The United States spent 2.7 trillion dollars last year on health care delivery representing over 17 percent of Gross Domestic Product. These absolute costs are continuing to increase more rapidly than any other product or service in our entire economy. The health care sector of the American economy now represents greater than one-sixth of the total U.S. economy. Barring substantial health care reform, health care costs are likely to continue to increase disproportionately every year into the foreseeable future.

The problem is not just the costs of the health care sector but the fact that almost two thirds of the 6 percent cost increase in health care this year was spent on the use of new

technology of somewhat questionable value that may entail increased danger for the average patient. Current unsustainable annual cost increases in health care delivery are challenging the health care system to undergo major reform as it attempts to reduce costs while at the same time improving the quality of services delivered to patients. Health care reform efforts have uncovered many problems involving large numbers of tests and procedures that are being ordered by physicians that offer little or no value while exposing the patient to potential harm. Feldstein (2007) argues that there are two main causes of escalating medical care spending in this country. These factors include high prices charged for medical products and services and the volume of unnecessary care delivered by doctors and hospitals. A considerable portion of the unnecessary utilization of scarce health care resources results directly from the practice of defensive medicine by physicians attempting to avoid medical malpractice actions. Malpractice awards drive up malpractice insurance costs for doctors. There is strong evidence that doctors engage in “defensive medicine” in an attempt to avoid resultant further increases in malpractice claims if they are judged to have been negligent. According to Feldstein (2007) the cost of defensive medicine is responsible for \$30 billion dollars in the Medicare program alone on an annual basis.

A survey of defensive medicine practices in Massachusetts in 2008 revealed that such practices cost a minimum of \$1.4 billion in that state alone. The Kaiser Foundation (2009) points out that in this survey, 83 percent of the respondents reported practicing defensive medicine with an average of between 18 percent and 28 percent of tests, procedures, referrals and consultations occurring for protection from medical malpractice. It was also discovered that many of these tests and procedures may actually harm the patient that they are attempting to protect.

According to Brownlee (2007) almost everyone believes that we are receiving too little medical care in this country. Many people across our nation believe that everyone is attempting to deny citizens access to medical care, but the fact is that a third of the medical care that we do receive is unnecessary. Americans receive expensive tests that include MRIs, CT scans and blood tests that help doctors diagnose disease but may produce secondary effects including medical errors and the treatment of conditions that never would have bothered the patient if they had remained undiscovered. Brownlee goes on to explain that overtreatment has gotten very little attention from policy makers because it is very difficult to point to individual patients who have actually been harmed by too much medical care. The cause and effect relationship between physicians ordering too many tests and procedures and patients being harmed has been difficult to prove on a large enough scale to garner public attention. Additionally, the fact that the usefulness of an ordered test is not able to be determined prospectively to the degree that it can be evaluated in retrospect renders such studies problematic regarding real time decision-making for the application of most diagnostic modalities.

The problem of overtreatment frequently results from physicians practicing defensive medicine. This often generates increased income with concomitant exposure of patients to

potential dangers from too many tests and medical procedures. One of the bedrock principles of medicine is “Do no harm”. This dictum has two viewpoints which include harms resulting from inaction and harms caused by actions taken. The practice of defensive medicine in many instances violates this principle from the perspective of actions taken because there is overwhelming evidence that many people are being hurt by the very system that is supposed to be offering them a cure for their medical problems. Defensive medicine does on occasion result in avoidance of harm through applying this principle regarding inaction as a cause of harm. Physician ordered tests and procedures on one hand provide the patient with a hope of earlier diagnosis and cure of illness and disease but on the other hand can be dangerous and in some cases actually cause premature death.

According to Searcey and Goldstein (2009) defensive medicine, an indirect result of medical malpractice liabilities, plays a much larger role in health care spending than the direct costs of medical malpractice law suits. By ordering additional tests and procedures the physician protects himself from lawsuits, provides the patient with a more comprehensive evaluation and in many cases increases his or her own income. This is done even though the physician has taken an oath to consider the well-being of their patient over their own self- interest. If these tests and procedures harm the patient then the physician’s actions have resulted in violation of the oath to do no harm.

MEDICAL MALPRACTICE

The legal profession generally argues that medical malpractice liability law has two major objectives that include: Fair and just compensation of patients who sustain injury as a result of medical negligence and deterrence of substandard provider practices in the future in order to avoid medical negligence. Unfortunately, the vast majority of available research clearly supports the fact that current malpractice law is not achieving these objectives. Malpractice law suits have resulted in major secondary effects, one of which is that large numbers of physicians are practicing defensive medicine by ordering additional, and in many cases unnecessary, medical tests and procedures.

Hammaker (2011) points out that medical malpractice requires professional negligence or commission of an intentional tort. A tort is usually defined as a civil wrong resulting in damages for which the remedy is most often found in the form of monetary awards. The fear of medical malpractice law suits does change the attitudes of the health care professionals. Changing physician attitudes results in physician behavioral changes that ultimately lead to increases in medical testing, procedures and health care costs.

Since we are a litigious society the legal system in our country encourages defensive medicine and many doctors are willing to comply by viewing it as a dimension of providing quality health care. Frermgen (2009) points out that malpractice insurance is very expensive costing some medical specialists over \$100,000 every year. The total costs of medical

malpractice far exceed these figures and include both the insurance costs and the costs associated with defensive medicine. Santere and Neun (2010) note that many physicians believe that they are encouraged by the threat of malpractice to over utilize medical services.

Many physicians can also benefit financially by ordering additional tests and procedures to protect themselves from law suits. The additional testing has both potential beneficial as well as harmful effects. Some of these tests will result in earlier diagnosis of conditions with improved outcomes. The other side effect of ordering additional medical care is the very real possibility of hurting the patient through medical errors resulting from the additional care. This possibility of harming patients while protecting themselves and increasing their own income is clearly a violation of medical ethics thus making the act of defensive medicine resulting in patient harm an unethical practice.

According to Weinstein and Skinner (2010) the current medical liability system has produced a number of non- intended results. One of these results is that the fear of lawsuits and the resulting practice of defensive medicine often increases the physician's income, particularly in fee-for-service arrangements, but may also place the patient at risk for injury or death from an unnecessary medical procedure. Weinstein also argues that diagnostic defensive medicine practices affect costs to a much greater extent than do therapeutic defensive practices with no increase in expected to benefit the patient. American families pay as much as \$2,000 each year to pay for the cost of defensive medicine. Therefore, the fear of lawsuits does lead providers to behave in a way that leads to increased health care costs that represent for the most part a waste of scarce health care resources.

According to Wennberg, Fisher, Goodman, and Skinner (2008) higher spending and increased use of supply sensitive care is not always associated with better care. There is a lack of strong scientific evidence to guide most clinical decisions. Therefore, the general assumption by physicians and patients is that more medical care is associated with better health outcomes. Weinstein and Skinner (2010) argue that there is often a weak or even negative association between medical spending and the outcomes associated with the increased spending. In addition, many medical interventions utilized by physicians have little or no empirical or evidence-based data supporting its use, which leads to wide variation in care delivery and quality of outcomes as well as additional costs to the system.

The medical malpractice system in our country attempts to change the behavior of physicians when it comes to making medical mistakes that may cause harm to their patients. Studdert, Mello, and Sage (2005) point out that in order to reduce medical malpractice suits many physicians will, against their own clinical judgment, order additional medical tests and procedures. In fact, one study in Pennsylvania found 93 percent of doctors admitting that they deviated from sound medical practice to avoid malpractice suits. This leads to an increase in the practice of "defensive medicine" by physicians. According to Feldstein (2007) physicians are able to shift the costs for these unnecessary procedures on to others including the patient or an insurance company.

Feldstein (2007) also argues that if physicians are reimbursed on a fee for service basis they often benefit economically by prescribing additional testing for their patients. These tests, although desired by patients, usually provide very little if any benefit for the patient while protecting the physician from expensive law suits. It seems that both physicians and patients often assume that more medicine represents good medicine. This belief is clearly in error. It should also be understood that corporate employed physicians in many circumstances, depending upon patient insurance coverage, can also benefit from increased revenue production and malpractice avoidance through additional testing.

Sloan and Kasper (2008) argue that effective Tort Law should serve many functions including the provision of beneficial care, avoiding medical error, and avoiding wasteful care. It seems odd that fear of malpractice suits is actually causing, in certain circumstances, some the problems that Tort Law was purportedly designed to prevent. By fostering the ordering of more tests that increase the costs of health care, improve provider's income by providing unnecessary care, and potentially providing opportunity for increased medical errors that may result in harm or even death to the patient, medical malpractice law is in part a self-fulfilling prophesy.

DEFENSIVE MEDICINE

The difficult to understand multidimensional inputs and outcomes of the practice of defensive medicine make this a complex issue that does not lend itself to easy analysis or solution. According to Studdert et al. (2005) defensive medicine is a deviation from sound medical care because some of the additional tests may offer additional services to the patient that provide only marginal value if any. When one also takes into consideration patient autonomy and increasing patient demands for additional studies, it is difficult to assign full responsibility to an ordering physician for additional testing and procedures. These realities of our nation's changing health care environment result in large part from direct-to-consumer advertising, more readily available sources of medical information, and increased consumer knowledge.

In addition, there is no clear dividing line between medical necessity and unnecessary service provision. This is particularly true in real time where many factors are taken into consideration in ordering tests and procedures. These factors include not only the provider's knowledge of risk/benefit uncertainties, but also the patient's psychological and physiological status. What may represent a straightforward decision to undertake or forego a test or procedure in one circumstance may be complex and non-resolvable in another similar set of circumstances with a different provider or patient, or even the same patient and provider at a different time. While "defensive medicine" is impossible to define with precision on a case-by-case approach, it does exist and represents a huge and growing element of waste across our health care landscape. It is also potentially dangerous for the patient.

According to Frermgen (2009) the practice of defensive medicine usually results in increasing costs of health care and the patient receiving additional, sometimes painful tests and

procedures. Many of these tests offer the patient limited medical value. Making matters worse, many of these tests, judged to be useless in retrospect, may actually result in harm to the patient while offering protection to the physician from a law suit.

There is not a large volume of quality literature available on the true costs of defensive medicine and its full impact on the resulting health of the patient. The Pacific Research Institute found the cost of defensive medicine to be over \$120 billion a year and produces little medical value while actually increasing the dangers to patients from the side effects of the tests or procedures. The evidence is mounting that the benefits of more tests and procedures is often overstated and the risks of these medical interventions are frequently understated.

Decisions in medicine always deal with tradeoffs. The clinician desires to avoid liability while trying to improve the outcome for the patient. Unfortunately, defensive medicine usually offers little benefit to the patient while adding potential risk to the medical encounter. Manner (2007) argues that the motive to practice defensive medicine may not even be conscious. Many physicians order additional medical interventions simply out of routine practice patterns that have developed over the years. This type of practice behavior may be easier to stop if the physician understood that it might constitute unethical behavior.

Beerel (2009) argues that one of the more important parts of learning new behaviors involves unlearning old behaviors. Changing well-ingrained old behaviors like physicians ordering too many medical interventions represents a very difficult challenge for those attempting to reform health care. This is going to be one of the greatest barriers to building our new health care system. An essential element of success in overcoming this barrier will be replacement of the current medical malpractice tort system and its attendant psychological and economic risk aversion realities with a different model to address patient harm resulting from medical care.

Pauker and Pauker (1998) introduce the concept of a marginal liability-effectiveness ratio. The decrease in patient loss of utility is strongly affected by their doctor's willingness to accept risk and uncertainty in their medical decision making. The clinician who is risk averse will reduce his or her liability while potentially exposing their patient to greater risk by ordering a larger number of medical interventions. This equation is a function of education, training and previous exposure to medical malpractice law suits. The physician patient relationship and the communication time available with the patient also affect the amount of defensive medicine practiced by certain clinicians. This liability threshold model points out that additional medical interventions actually provide patients with a disservice in aggregate, but the results will vary on a case-by-case basis.

Budetti (2005) argues that defensive medicine is quite capable of increasing the risk of medical malpractice. Physicians who order tests and procedures offering low medical value while exposing their patients to medical risk are in fact placing themselves at an increased risk of being sued for their behaviors. The reality, however, is that a physician is much more likely to be the target of a law suit for a missed diagnosis than for over diagnosis. In addition, there is

significant variability in the risk to benefit exposure ratio across the broad spectrum of medical tests and procedures, and these risks and benefits often do not often correlate with costs and reimbursements. This information should be incorporated to help change physician behavior when it comes to the practice of defensive medicine. It seems that there needs to a strong effort to help physicians change their attitudes toward liability, risk, and uncertainty. Since this is a learned behavior developed by physicians over the years in association with changes in the liability environment, it can become an unlearned behavior over time if the appropriate incentives are put in place and existing, oftentimes growing, barriers are removed.

DEMAND FOR PHYSICIAN SERVICES

The demand for physician services is what economists call a derived demand. The demand is derived from a patient's demand for good health. Despite doctors complaining about their loss of power to manage health care, our medical care costs are still largely driven by physician decision-making. Depending upon their practice model and reimbursement model, many physicians have the unique ability to create their own demand and increase their own income all in the name of quality health care and protection from law suits.

Santere and Neun (2010) argue that physicians have the power to use supplier induced demand for many of the components of health care. The incentive to induce demand for services will vary widely depending upon physician practice and reimbursement models. These authors point out that the premise of this type of demand allows the physician to abuse his or her role as the medical advisor for the patient to advance their own economic self-interest. This involves ordering tests; follow up visits, medical procedures and even surgeries that may offer very little if any medical value for the patient. Many of these medical services may also pose dangers for the patients but are still ordered by many physicians.

A large portion of physician and physician-related cost is related to defensive medicine which imposes unnecessary medical costs and medical risks while producing very little value for the patient. Kessler and McCellan (1996) point out that fear of legal liability may act as the incentive for physicians to administer costly precautionary treatments that offer minimal medical benefit.

The Institute of Medicine (IOM) (1999) reports that as many as 98,000 patients die each year from preventable medical errors. In many instances physicians and hospitals are actually reimbursed for having played a role in creating the error and then reimbursed again for rectifying the error if the patient lives. These errors included diagnostic and treatment errors, surgical errors, drug errors, hospital acquired infections and delay in treatment to name a few. The aggregate number of medical errors will likely increase with more testing and hospitalizations resulting from defensive medicine. It must be pointed out that many rules and regulations have been enacted in recent years to curtail this type of physician power but abuses still occur.

EPIDEMIC OF MEDICAL ERRORS

A very serious secondary effect of the practice of defensive medicine is the very real possibility of harming the patient while performing useless medical procedures. According to Black and Miller (2008) the percentage of hospital admissions experiencing injury or death is 2.9 percent on the low side and 3.7 percent on the high side.

The IOM (1999) defines medical errors as “the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim.” There is mounting evidence that entering the medical care system at any location increases the risk of adverse drug events, errors in care delivery and hospital acquired infections. These errors are increasing the cost of health care delivery, requiring longer hospital stays, and causing disability, death and the loss of trust in medical care. In fact, medical errors are now estimated to be the eighth leading cause of death in the United States. This situation is totally unacceptable and needs to be considered when evaluating the ethics of physicians practicing defensive medicine.

Wachter (2004) points out that among the unintended consequences of progress in health care diagnosis and treatment modalities are resultant increased dangers in health care delivery. He points to one study where the average ICU patient experiences 1.7 errors every day and many of these errors can be potentially fatal. According to Wachter every medical error case has been looked at as an isolated incident thereby rendering the enormity of the problem a hidden epidemic. In fact, many health care professionals actually began thinking about these errors as unavoidable occurrences in an industry that employs so much advanced technology, including what many view as the premature mandate for application of electronic medical records.

THE ETHICAL IMPLICATIONS OF DEFENSIVE MEDICINE

The Hippocratic Oath is one of the oldest documents in history. That oath along with more modern iterations is held in high esteem by most physicians. It is used as a guide to the conduct of medical professionals in many countries. It represents an oath taken by physicians to practice medicine ethically and to focus on the dictum to never harm their patient. The ordering of extra tests and treatments may prevent a wrong or missed diagnosis by the physician, but the attendant additional medical care may also harm the patient and may very well result in violation of the Hippocratic Oath or its modern versions as taken by physicians.

In fact, the practice of defensive medicine by physicians produces a host of ethical questions for a number of physicians. Defensive medicine may also represent violation of the philosophic rule of no maleficence by the physician as he or she treats the patient. Shi and Singh (2010) point out that non-maleficence means that providers of health services have a moral obligation to do no harm to their patients. The ordering of unneeded tests and procedures for patients by their physician places them in danger of violating this principle for no reason other than to protect the physician from a medical malpractice claim. It must be understood, however,

that patient physiology and psychology both need to be taken into consideration in defining medical necessity. Some patients are so positioned that a test or procedure can be of psychological benefit even though it offers no physiologic benefit and may carry attendant risks.

The practice of defensive medicine in order to protect the physician from lawsuits also benefits some physicians in terms of increasing the physician's income. Chen (2007) argues that these additional tests are also a result of the corruption of medical decision making to earn additional income. These practices then are not the result of an attempt to benefit the patient but are ordered primarily to protect the physician from malpractice suits and also to increase the physician's income. There also exist practice and reimbursement models in which extra testing is harmful to physician income and may result in the failure to order necessary tests. This scenario plays out in certain corporate and HMO models of employment and capitation models of reimbursement. Fisher (2003) argues that one third of medical costs are used for services that fail to improve health and may actually cause harm for the patient. One example of the danger of using too many tests is found in the overuse of computed tomographic (CT) scans which have increased three fold since 1993. According to Gonzalez, Mahesh, Kim, Bhargavan, Lewis Mettler and Land (2009) the increase in CT use have made large contributions to the total cancer risk in this country. Other studies have demonstrated the beneficial effects of such studies, and there is often no clear cut dividing line in real time between appropriate and unnecessary ordering of such tests.

According to Dyck (2010) management ethics is nothing more than an evaluation of moral standards and how these standards influence the manager's action. The physician acts as the manager of a patient's health when he or she makes decisions concerning tests or procedures to improve the health of the patient. Third party payers will often intervene and refuse to cover ordered tests and procedures, leaving it to the patient to accept or reject the physician's advice. The most common result of third party payer refusal to cover a test or procedure is non-acceptance of the physician's advice regarding the recommendation.

An effective approach to evaluate the use of defensive medicine by physicians would utilize the mainstream moral point of view. This point of view draws heavily on consequentialist theory which relies on the consequences of the action in determining what is ethical. This theory suggests that actions resulting in beneficial outcomes for the individual are deemed ethical. According to Boatright (2007) in order to determine whether an act is right or wrong we need to utilize ethical theories that are capable of enabling us to think through ethical business issues. The use of the ethical theory of utilitarianism has special significance when dealing with business decisions in making choices that offer the greatest overall benefits. A major problem with this approach to evaluation is that medical use decisions are made in real time prior to test and procedure results and outcomes while the consequentialist/utilitarian analysis is based upon after-the-fact retrospective analysis.

According to Frermgen (2009) medical ethics deals with questions that are specifically related to the practice of medicine. Medical ethics' main concern deals with the behavior of

health care professionals. The physician is the most important contributor to the practice of medicine. Frermgen points out that utilitarianism is a consequence-based theory which advocates efficiency in the distribution of scarce resources. Since medical tests and procedures are expensive resources, utilitarianism ethics would take a cost-benefit approach to the use of these resources. More importantly, it asks the question: what are the consequences of physicians ordering tests and procedures of limited value while exposing the patient to the potential danger of any medical intervention? Put another way, does the end justify the means? The answer is no in most cases because under a utilitarian ethics based legal analysis defensive medical practices becomes an unethical acts by physicians according to consequence-based moral philosophies.

The most widely accepted consequentialist theory is utilitarianism espoused by Jeremy Bentham and John Stuart Mill. They believed that utilitarianism requires ethical managers to produce the greatest good for the greatest numbers of people. The manager ought to act to produce the best consequences possible for the largest number of people. This is hardly the case with a physician involved in the practice of defensive medicine. However, it also needs to be understood that honorable physicians delivering quality care have been driven away from practice by frivolous law suits. The result is less available care for that physician's current and prospective patients. Consequentialist theories need to take into consideration multiple dimensions of outcomes assessment, including secondary effects and externalities.

Utilitarian's argue that it is possible to compare the intrinsic values produced by two alternative actions and estimate which would have better consequences. This line of thought is actually based on the maximization of good. In the area of managing scarce resources the theory would support positive change if the maximum good is being produced. It is necessary to make comparisons of the values of the effects of alternative courses of action. The metrics available to analyze these effects are neither universally acceptable nor easily applicable. The difference, for instance, between using the measurement of years of life versus quality of life years can be profound. Examining the same data but using the different metrics can result in opposite conclusions regarding maximization of good.

Shaw and Barry (2010) argue that the moral rightness of an action depends on its results. The question then becomes what is right and for whom? In the case of defensive medicine there are at least two parties being affected by the decision of the physician. The doctor is protected from litigation and may profit from the additional medical tests or procedures. The patient is affected by the costs and time lost because of the intervention and may ultimately be harmed if medical errors are made by the additional and perhaps useless testing and procedures. Other patients may benefit by earlier diagnosis and treatment of otherwise unsuspected or marginalized diagnostic possibilities.

Many ethical theories would not support any part of the practice of defensive medicine by physicians. The refusal to support defensive medicine is based on the belief that the action by physicians of ordering additional tests and procedures for patients leads to a lesser amount of total good than would have occurred by not subjecting the patients to more medical care. It is

clear that these medical procedures of limited if any value most often benefit only the doctor or the doctor's corporate employer while increasing the cost of health care and, perhaps, harming the patient. This practice is therefore, ethically wrong when the results are considered in aggregate.

Paola, Walker, and Nixon (2010) argue that the greatest happiness principle states that actions are right in proportion as they promote happiness; wrong as they tend to promote the opposite of happiness. Therefore, only pleasure and freedom from pain are desirable as ends in themselves. The end in question is not the agent's own happiness but the greatest amount of happiness for the greatest number. However, freedom from anxiety among patients must also be accounted for, and this element of happiness will often shift the equation towards the increased use of tests and procedures.

The utilitarian thought process revolves around the desire to maximize total happiness even though we are unsure which decision or action will produce the most good. According to Shaw and Barry (2010) utilitarianism offers a very clear and distinct method for developing and evaluating decisions. The decision is good if it promotes the general welfare more than any of the other specific alternatives or choices. Individual concerns are largely ignored in this philosophic management strategy, and this places the practicing physician in a difficult situation regarding adherence to the Hippocratic Oath, with its focus on the good, and avoidance of harm, of the individual patient, and utilitarianism, with its concern for the common good.

BARRIERS TO UNETHICAL PHYSICIAN BEHAVIOR

There is another side of the debate as to whether more medical tests are counterproductive or do these tests actually benefit patients. Many doctors treat patients whose signs and symptoms result in a clear, textbook answer for the patient. This treatment can include patient education, counseling, monitoring the condition, using medications, or having surgery. But oftentimes, patients have complicated problems that do not have a clear, concise medical answer or positive outcome. These patients may have many complicated interrelated problems such as age, genetics, addictions, bad health habits, environmental issues, and associated medical problems.

Doctors are expected to have answers and to come to conclusions in order to manage and to treat a patient. But they are also human and sometimes do not have all of the answers or all of the correct answers. These tests may eliminate some of the possibilities of the medical problem and may also prove to be unnecessary. But without these tests, medical management of the patient may involve longer, but possibly less costly interventions. There is no easy answer at times as to what tests may prove to be beneficial or helpful, especially with complicated medical problems.

According to Relman (1985) the costs of health care in this country are largely dependent on the physician since he or she orders tests, prescribes medications and admits and discharges

patients from hospitals. In some cases this power given to physicians has been abused and efforts have been made to curb the possibility of physicians violating the trust placed in them by society. This paper is not arguing that all physicians are practicing unethical behavior by ordering large numbers of unnecessary tests and medical procedures. The vast majority of physicians in this country order only the tests and medical procedures that they believe are necessary to bring the patient back to good health. In fact, there has been legislation passed by Congress that makes it very difficult to order tests or prescription drugs that provide profit for the physician or his or her immediate family.

The Stark Law, also known as the physician self-referral law was passed by Congress in 1989. This law is meant to prohibit physicians from making referrals for certain health services payable by Medicare to an entity with which the physician or a family member has a financial relationship. The problem was first addressed in 1989 when Congressman Peter Stark of California sponsored legislation that would prohibit physicians from referring patients to clinical laboratories in which the physician or an immediate family member had a financial interest. The statute prohibited the billing for such a referral to Medicare or any third party payer for services rendered pursuant to a prohibited referral. Although limited exceptions to the rule were created, the effect was to create a firewall between the physician and clinical laboratory services. Congress revisited this arena of perceived and actual conflicts of interest in 1993 when it extended the payment prohibitions to Medicaid billings and included the additional health care services of physical and occupational therapy, radiology services, radiation therapy, durable medical equipment, home health services, and inpatient and outpatient hospital services. These new areas of “coverage” became commonly known as the “Stark II laws.”

The same type of ethical issue presents itself when physicians write prescriptions for drugs. According to Chimonas and Rothman (2005), physicians write more than 2.2 billion prescriptions each year and have a critical need for the latest information about these drugs including potential adverse effects. According to Pinto, Lipowski, Segal, Kimberlin, and Algina (2007) gifts to physicians from pharmaceutical companies have produced controversy in recent years. Pharmaceutical companies spend the vast majority of their promotion budget giving gifts to utilize non-generic drugs and rapid prescribing of new drugs. In response to this conflict of interest and potential unethical behavior by physicians the American Medical Association passed the “AMA’s Guidelines on Gifts to Physicians from Industry” in 1990. A number of recent studies conducted since these guidelines were adopted by the AMA Council on Ethical and Judicial Affairs found that physicians and industry representatives were not adhering to these guidelines.

The check and balance system that hospitals have in place allows a doctor the opportunity to defend themselves if questionable tests are ordered. These medical committees and review boards are staffed by other doctors and hospital management personnel. The hospitals are also watching their bottom line and of course do not want medical malpractice cases occurring against them. In certain hospitals, these review boards are in place to review the tests that

doctors want ordered before the doctors can actually order them. The professional or personal conduct of a physician or other healthcare professional may also be investigated. If a medical peer review committee finds that a physician has departed from accepted standards, it may recommend limiting or terminating the physician's privileges at an institution. In hospitals, only a peer review committee authorized by the physician medical staff is authorized to take action regarding a physician's medical privileges at that institution. A committee convened by the hospital administration or other group within the hospital may make disciplinary recommendations to the physician medical staff. Departmental peer review committees are composed of physicians, while hospital-based performance-appraisal and systems-analysis committees may include nurses or administrators with or without the participation of physicians.

POTENTIAL SOLUTIONS TO THE PROBLEM

Now that the possibility of defensive medicine has been exposed as a potential unethical practice, what should be done? There are at least four possible solutions to the problem of physicians practicing defensive medicine in an attempt to avoid medical malpractice claims. These potential solutions include:

Tort reform

The vast majority of people agree that our medical liability system is broken beyond repair but very little has been done to repair the system. The current system does not compensate injured individuals appropriately and does very little to address the prevention of future medical errors. Many of the States have proven that legal reform does work to a degree, but it takes a long period of time to produce significant results. Limiting damage claims and awards along with the limitation of attorney fees have reduced the cost of medical malpractice insurance fees in some states. Much more needs to be done in order to truly reform our medical malpractice system.

The fact that our current medical malpractice system is steeped in traditions of inefficiency, unpredictability, and ineffectiveness needs to be addressed at a root cause level. It is widely understood that less than 50 percent of the money allotted to a malpractice case finds its way to the deserving plaintiff. In addition, the outcomes of actions that are based upon essentially similar harms suffered from the same set of circumstances can be strikingly different in different courtrooms before different lay juries. Finally, as noted, the system has failed to meet the objectives of fair and just compensation for deserving plaintiffs and reduced instances of substandard care by providers despite the hundreds of millions of dollars per year poured into the medical malpractice arena.

There are two fundamental causes for these problems. One is the ethical construct that underlies tort law. The other is the analytical approach to analysis employed by tort law. While

medicine is built upon a cooperative ethical foundation, tort law is built upon an adversarial ethical underpinning. The two ethical schools are meritorious when standing alone. However, where the two ethical constructs interface they are largely incompatible. Tort law can expect to arrive at truth only in situations where there are but two sides to an issue and where adversarial equipoise exists. The combination of these conditions is rarely encountered in medical malpractice cases. Medicine also teaches a systems thinking approach to patient care, while malpractice law enforces a linear approach to problems at hand. Linear analytical thinking is incapable of addressing the multidimensional factors and interactions of factors that are involved in error analysis in complex situations such as exist across most areas of health care. As with the different ethical constructs, these differing analytical approaches to problem solving are fundamentally at odds.

Simply stated, tort law is the wrong tool for the job. As an analogy, no matter how hard one works at reforming a hammer, the results will never be consistently effective in securing a loose screw. If the job calls for a screwdriver then reforming a hammer will never prove to be effective. This needs to be understood if we as a nation hope to see improvement in fair and just compensation for patients harmed by medical behaviors as well as to achieve decreased sub-standard care delivery by providers. Specialty health courts based on equity principles offer the best hope for our citizens. Those who feel that the current system is beyond repair are essentially correct. However, there is little to suggest that we will see effective tort replacement in the foreseeable future.

Forced medical ethics

There are those who believe that the answer to the potential patient harm that may arise from the practice of defensive medicine by physicians should come from the profession itself. This would mean that the American Medical Association, State Medical Societies and local medical societies would police their members through a series of rules and regulations designed to stop the overuse of medical tests and procedures. In the past this may have been an option, but the realities confronting physicians and their societies today are such that this is not a feasible approach to solving the problems of defensive medicine. To begin with, only about 20 percent of practicing physicians belong to the AMA as AMA organizational membership has fallen into disfavor among the majority of doctors. In addition, laws have interceded to render medical organizations such as the AMA and, to a different extent, state societies ineffective in applying rules to govern physician behaviors. This lack of effective control can be seen in the profusion of direct-to-consumer advertising that permeates our airways. This is at odds with medical ethics as taught in medical schools, but it has won favor through court decisions to override ethical constraints on physician advertising. Another problem with this solution is that most physicians still believe that subjecting their patients to more medical interventions actually represents better medicine. The large volume of medical malpractice claims for not ordering specific diagnostic

procedures, i.e. missed diagnoses, highlights the perceived need to order more tests and interventions by physicians.

It seems to be a behavioral practice that physicians have developed over the years that has resulted from fear of lawsuits and an attempt by the physician to provide a higher standard of health care to their patients. This proclivity must be changed if we hope to rein in defensive medicine. Additional physician education regarding the dangers associated with too much medicine, financial incentives in combination with legal risk curtailment, and provision of penalties for ordering useless tests and providing unnecessary procedures all represent options to be considered. Currently, third party payers hold significant power to reduce unnecessary testing and procedures, but there is no operational definition of medical necessity that allows a clear line to be drawn between medically necessary and unnecessary behaviors.

Ideally, the medical profession should police itself. Because this cannot work in our current medical/legal environment, third party payers and consumers need to take better control of what constitutes good health care. It is unlikely that any party to health care service provision favors continuation of valueless and dangerous medical interventions. Defensive medicine represents a dual medical and legal issue. Failure to address both sides of the conundrum effectively will result in failure.

Consumer education

According to Kiviat (2010) one of the reasons for the escalation in health care costs is found in the fact that nobody knows what anything costs. If the consumer were made aware of costs of health care tests and procedures, and if the consumer were responsible in part or in full for payment of the costs, then the patient might be more willing to question the necessity of the medical intervention. Simply knowing costs is not the same as being responsible to cover the costs, and decision-making by the patient is significantly different in these differing circumstances. Another area of improvement in patient knowledge is provision to the patient/consumer information about the dangers associated with the test or procedure. This falls under the requirement of informed consent, but is often not fully revealed to or understood by patients. If we were able to assure that consumers were fully understanding of the potential value and risks of any proposed medical intervention we would have an more knowledgeable consumer cohort who might surprise us with their ability to make more rational decisions about the medical necessity of additional care, including defensive medical practices.

Comparative effectiveness research

The most promising solution to the problem of physicians ordering useless medical tests and procedures is the development and use of Comparative Effectiveness Research. Nussbaum, Tirrell, Wechsler, and Randall (2010) point out that part of the new health care reform legislation

includes an appropriation of \$500 million more a year for something called “comparative effectiveness research.” This is a procedure that should reduce the costs of wasteful medical tests and procedures that should produce \$700 billion in annual savings every year. This process represents an attempt to control runaway health care costs without reducing the quality of health care services by eliminating medical waste.

According to the Congressional Budget Office (2007) Comparative Effectiveness Research (CER) represents an intense evaluation of different treatment options for a given medical condition. Weinstein and Skinner (2010) argue that CER research offers a potential solution to the escalation in the costs of delivering health care in this country. Mushlin and Ghomrawi (2010) point out that the vast majority of countries that have reformed their health care system have included some form of CER in their final product. They have done so to protect patients from harm while attempting to improve quality and tame health care costs.

Lowe (2010) points out that CER may turn out to be the physician’s best friend. Government sponsored CER could offer physicians publically available research that can help the ethical physician decide which testing and procedures are best for their patients without exposing these patients to unnecessary risk. This research could also induce hospitals and health plans to improve efficiency in health care and not worry as much about simply cutting costs.

The Congressional Budget Office completed a report on comparative effectiveness of medical treatments in 2007. This report points out that opportunities are available to constrain health care costs without any adverse health consequences. The report used the geographic differences in health spending in the U.S. as an example where more spending does not produce higher life expectancy or better health outcomes as proof of their claim. There is abundant evidence available concerning which treatments and procedures work best for which patients and whether the added benefits of more effective services are worth the increased costs. This suggests that there needs to be expansion in the gathering of better information about costs, risks and benefits of various options in the treatment of illness and disease

The Congressional Budget Office report is attempting to use sophisticated research to change physician behavior when it comes to ordering medical tests and procedures. This change in behavior will require financial incentives to be in place to force the physician into changing their use of defensive medicine. CER is an attempt to utilize statistics-based research to modify medical decision making. Through the rigorous evaluation of different treatment modalities there will be a search for the best way to treat illness and disease at the lowest cost that produces least danger for the patient. In many instances this research may recommend that certain tests, medicines and procedures not be utilized because they produce little value, cost more than they are worth and may place the patient in unneeded peril.

The new CER entity would allow questioning of many common procedures and treatments routinely ordered by physicians in this country. The economic stimulus legislation passed by Congress last year included 1.1 billion dollars to create a new Federal agency to

manage the process. The health reform legislation recently signed into law by the President included 500 million or more a year to continue the CER process.

This is similar to the evaluation of medical interventions that has become standard practice in other countries. The National Institute for Health and Clinical Excellence (NICE) was established in 1999 by the United Kingdom's National Health Service. This agency evaluates clinical effectiveness and cost effectiveness of new and existing medicines and other procedures. This same type of evaluation will provide our country with the opportunity to reduce costs and eliminate medical interventions of limited value.

DISCUSSION

It has become very clear that medical malpractice liability law is not achieving its objectives of compensating patients who have been injured by negligence and stopping providers from practicing negligently. It is also evident that the fears of medical lawsuits have clearly changed physician practice patterns resulting in more testing and procedures that usually provide limited value while dramatically increasing the cost of health care delivery in this country.

The practice of defensive medicine increases the number of services offered by providers. These additional services usually offer very little improvement in health outcomes while providing some protection from a medical malpractice law suit for the providers that order the tests. This additional testing increases the physician's income but may also place his or her patient at additional risk for medical errors. The physician does not seem to understand that the practice of defensive medicine may be a violation of the Hippocratic Oath and may also be a violation of medical ethics. I do not think that anyone would argue that

Physicians should not hurt their patients.

Physicians should not enrich themselves by ordering medical procedures for their patients with limited medical value and potential danger for the patient.

If we only use the Hippocratic Oath and the principles of utilitarianism it would seem that the practice of defensive medicine by physicians is morally wrong. The physician is ordering medical procedures for their own self-interest while possibly producing injury or death for the patient. There are several potential solutions to the problems associated with physicians ordering too many medical interventions. These solutions include: reform of the medical malpractice system, forcing physician behavior change through rules and regulations imposed by the medical societies, education of the consumer to resist overtreatment and Comparative Effectiveness Research produced by the government. The most promising remedy seems to be the expansion and use of Comparative Effectiveness Research. This remedy would make the value and cost of

medical procedures transparent for consumers, physicians and third party payers to view and then question why these interventions were even considered for use.

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