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**Prevention of increasing burnout levels among physicians of different specialties
and doctoral degrees**

2013

BY

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Biology

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INTRODUCTION

Burnout rates are steadily increasing among physicians all over the world (Sime, Quick, Saleh, & Martin, 2007). Burnout is defined as high levels of emotional exhaustion (EE), high levels of depersonalization (DP), and low levels of personal achievement (PA) (Ionita, Copotocan, & Copotoiu, S., 2011). These burnout rates are directly correlated with many factors, such as high levels of emotional exhaustion and stress (McManus, Winder, & Gordon, 2002), little experience in the medical field (Keswani, Taft, Coté, & Keefer, 2011), and long work hours which leads to sleep deprivation and fatigue (Jackson, 1999). These moderate to high levels of burnout are detrimental to the health of the physician and ultimately reflect in the dehumanization of “doctor-patient relationships” (Jackson, 1999).

Risk Factors Associated with Increased Burnout Levels

Even though previous studies continuously establish that burnout is showing itself more frequently in physicians today than it did several decades ago, what actually causes this burnout to reach more severe levels is still under speculation. In the medical field, there are certain practices, attitudes, and factors that may contribute to increased levels of emotional exhaustion, depersonalization, and decreased feelings of personal accomplishment. Some of the highest stress-related factors include: an increase in the number of hours worked per week, not having enough experience in the field or being a younger physician (Keswani, Taft, Coté, & Keefer, 2011), time pressure (Galantino, Baime, Maguire, Szapary, & Farrar, 2005) and management (Keswani, Taft, Coté, & Keefer, 2011), lack of sleep, problems with co-workers, lack of [financial] rewards (Popa, Raed, Purcărea, Lală, & Bobirnac, 2010), work-related interference with a physician’s home life (this is especially stressful for women) (

can, & Copotoiu, S., 2011), self-deprecating statements, and an increase in workload (Sime,

Quick, Saleh, & Martin, 2007). All of these circumstances have been proven in multiple studies to have a negative effect of burnout level.

There are other accompanying factors that also prove to have a negative effect on burnout rates. Keswani, Taft, Coté, & Keefer (2011) found that in a study of gastroenterologists, an increase in the complexity of procedures led to increased stress and overall burnout. Popa, Raed, Purcărea, Lală, & Bobirnac (2010) adds that unclear doctor-patient communication, lack of professional support and reduced self-esteem caused by faculty facilitates increases in burnout among physicians. Not only does an increase in the amount of critical decisions being made by a physician and heavy responsibility increase stress and burnout, but a study performed by Sime, Quick, Saleh, & Martin (2007) shows that these factors also produce significantly higher levels of emotional exhaustion, especially in surgeons. In addition, it is proven that high work demands, little control over scheduling and tasks performed at work, lack of fairness, and conflicting values in the workplace increase physician stress (Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack, 2009). Finally, can, & Copotoiu, S. (2011) shows that an increase in patient demands due to the continually increasing availability of patient care as well as some unrealistic expectations that patients have about the “power of medicine” in the modern world can put further stress on a physician.

Warning Signs and Effects of Burnout

As burnout and stress levels increase and are experienced for a prolonged period of time, there are certain warning signs and effects that start to change a physician’s attitude and mental state. Some character changes that can result from the large amount of professional demands placed on physicians include anything ranging from the desire to overcome these demands to an accepting and/or passive attitude, both of which lead to further burnout (Sime, Quick, Saleh, &

Martin, 2007). As the physician either works harder to overcome their work problems or becomes more and more complacent, the physician's attitude begins to change. These attitude alterations are facilitated by the risk factors previously mentioned. For example, increased workload can lead to withdrawal, overworking, procrastination, alcohol use, overeating, and sleep disturbance (Sime, Quick, Saleh, & Martin, 2007) or time pressure can make it difficult for doctors to express, or even feel, empathy towards patients as they were trained to practice (Galantino, Baime, Maguire, Szapary, & Farrar, 2005). Other attitudes adapted from long-term exposure to burnout include elevated levels of depression, persistent anger, cynicism, loneliness, suicidal thoughts or actions, self-doubt (Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack, 2009), irritability, disillusionment (Sime, Quick, Saleh, & Martin, 2007), negative emotions, inability to concentrate (Shanafelt et al., 2012), and an overall dissatisfaction with one's work (Shanafelt et al., 2012). This dissatisfaction can lead to difficulties in caring for patients, maintaining doctor-patient relations, and spending adequate time with patients (Shanafelt et al., 2012). It can also cause a lack of professional behavior, bring about negative personal consequences such as marital or family problems, and lead physicians to retire earlier (Shanafelt et al., 2012).

Stress can bring about major mental and physical fatigue, resulting primarily from sleep deprivation. Prolonged sleep loss and increased work hours can cause symptoms of neurobehavioral impairments to worsen, ultimately leading to a decrease in and/or loss of vigilance, critical thinking needed to accurately diagnose and treat patients, interference with human relations and patient trust, and can potentially have a negative impact on the well-being of the physician as well. Prolonged stress results in very specific physiological changes in a physician such as changes in the production of stress hormones (Shanafelt et al., 2012).

& Copotoiu, S., 2011), the “dysregulation of the hypothalamic-pituitary-adrenal axis along with sympathetic nervous system activation”, chronic inflammation, a weakened immune system, blood coagulation (this increases fibrinolysis, a process that keeps blood clots from becoming problematic), inadequate health behaviors (Sime, Quick, Saleh, & Martin, 2007) that are essential to maintaining a healthy lifestyle, an increased risk of cardiovascular disease, male infertility, Type 2 diabetes, and emotional and mental illness (Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack, 2009).

Preventative Factors Associated with Reduced Burnout Levels

Not everyone is affected the same by all of these factors and some physicians may exhibit a higher tolerance to stressful aspects of the medical field. For example, Sime, Quick, Saleh, & Martin (2007) find that Emergency Room doctors that are subjected to life or death situations and have to make difficult decisions on a regular basis have lower burnout levels and tend to be more optimistic because of this built-up tolerance to stressful events. Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack (2009) also makes the point that high levels of job satisfaction can protect a physician’s mental health from work-related stress. However, not everyone experiences these tolerances, so preventive measures must be taken. The most discussed strategy for prevention is the use of a behavioral specialist, with extensive stress management training, by physicians (Sime, Quick, Saleh, & Martin, 2007). Bruce, Conaglen, H.M., & Conaglen, J.V. (2005) found that emotional exhaustion is positively correlated with the need for a support system and that a one-to-one support system is preferred. Bragard et al. (2012) confirms this correlation in finding that low QWL (quality of Work Life) scores can predict increased EE scores. That being said, the amount of support offered to physicians had one of the lowest QWL scores in the study. Educating doctors about stress management early in their career may be

another useful strategy for prevention. If burnout is prolonged, clinical measures may need to be taken rather than educational strategies to overcome burnout more effectively. The overall goal of these techniques is to alter the physician's response to stress (Sime, Quick, Saleh, & Martin, 2007). In the study conducted by Galantino, Baime, Maguire, Szapary, & Farrar (2005), individuals are encouraged to work at and master certain areas of life that are more likely to cause burnout levels to increase: "(1) interpersonal skills, (2) self-management skills, and (3) psychological preparedness."

"Therapy" can be preformed based on the specific interest of the individual as well. Some stress-management strategies include exercise, family support, leisure time, hobbies (Sime, Quick, Saleh, & Martin, 2007), self-care, personal hygiene, developing or having a sense of humor (Jackson, 1999), leaving personal details out of the workplace, having a medical mentor and speaking with him or her often, practicing religion or faith, personal vacations, infrequent alcohol use, and making time to be alone with their spouse or significant other (Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack, 2009).

Burnout rates are constantly studied based on individual specialties, but are rarely compared with other specialties or doctoral degrees; the aim of this study is to accomplish both along with comparing burnout rates based on other variables including relationship status, average numbers of hours slept per night, and average number of hours worked per week, to name a few. Due to the results of previous studies, it is likely that: (a) Doctors of Osteopathic Medicine (DO) will exhibit higher burnout rates when compared to Medical Doctors (MD), (b) emergency medicine and surgical specialties will have some of the highest levels of burnout compared to other specialties, (c) the factor that causes the most stress for doctors will be the

insurance company, (d) doctors that exercise regularly will have lower average burnout scores, and (e) lack of sleep will cause higher burnout than the other variables analyzed in this study.

METHODS

Participants

The population consists of doctors with an M.D. or D.O. degree in Horry, Florence, Georgetown, and Charleston counties in South Carolina. Two hundred doctors in these counties will be chosen randomly using an online random integer generator. The expected return rate of the surveys is fairly high because of the hand-delivery method, at about 40% (n = 80). A shortened version of the informed consent form, approved by CCU's Institutional Research Board, will be distributed with the survey along with a self-addressed envelope for return purposes. This form states that participation is entirely voluntary and anonymous.

Questionnaire

Demographic information will be collected using a demographic questionnaire specific to this study. Questions will request information about doctoral degree, specialty, county of workplace, average number of hours of sleep per night, average number of hours worked per week, average amount of time spent getting ready in the morning, and relationship status. Burnout information will be measured using the Maslach Burnout Inventory Human Services Survey (MBI-HSS) which contains 22 questions measuring the three subscales of burnout: emotional exhaustion (a loss of passion or enjoyment for work), depersonalization (pessimistic feelings), and a low sense of personal achievement (Shanafelt et al., 2012). The MBI-HSS survey consists of 9 items that assess emotional exhaustion, 5 items that assess depersonalization, and 8 items that assess personal accomplishment. Participants are asked to answer each question in terms of "How often" each statement occurs in their everyday life.

“How often” is a scaled answer: ‘0’ is the lowest, meaning “Never” and ‘6’ is the highest, meaning “Every day”. Emotional exhaustion, depersonalization, and personal accomplishment are scored separately by adding up the scores from all of the questions that assess that particular subscale of burnout. Emotional exhaustion is given a score that ranges from 0 to 54, depersonalization is given a score ranging from 0 to 30, and personal accomplishment is given a score that ranges from 0 to 48 (Maslach & Jackson, 1981). The MBI survey has been used in most, if not all, burnout studies and has been altered several times to ensure and improve the survey’s validity and reliability. An additional questionnaire containing two open-ended questions will be used to obtain information regarding stress-causing risk factors and stress-managing protective factors.

Procedures

Doctors in the area were searched by specialty and zip code using Doctorfinder on the American Medical Association website (<https://apps.ama-assn.org/doctorfinder/disclaimer.do>). Lists for each zip code were compiled of every doctor in every specialty that is going to be analyzed. The number of surveys allotted to each specialty was determined based on a percentage: the number of physicians in that specialty divided by the total number of doctors in all specialties and zip codes. In the random number generator, the range of the output numbers is determined the total number of physicians in that specialty and how many output numbers are generated in one group is determined by the amount of surveys allotted to each specialty. The output numbers will then be used to determine which doctors in that certain specialty will receive a questionnaire. The license to reproduce 200 MBI surveys will be purchased as well as the scoring key, and the demographic and open-ended questions were created. All of the components will be combined with the shortened consent form and hand-delivered with a self-addressed

envelope for return purposes. When the return envelopes are received, the MBI questionnaires will be scored using the provided scoring key and these results, along with the demographic items, will be compiled into a spreadsheet. The risk and protective factors will also be organized and grouped with same/similar factors (if a physician writes more than one risk or protective factor, each one will be added to the chart). T-tests are going to be performed on all of the demographic variables and the three subscales of burnout.

RESULTS

Study sample

I hand-delivered (n=197) and faxed (n=3) 200 complete surveys, which included the MBI-HSS survey and the extra variables survey created for this study, to randomly chosen physicians in Horry, Georgetown, Florence, and Charleston counties in South Carolina. There were 79 physicians that returned completed MBI surveys (39.5% response rate). Twenty-seven of those physicians were excluded from the sample data because they did not include their degree, specialty, or both, and of those physicians, sixteen neglected to fill out the entire variables survey. The eleven physicians that filled out part or the entire variable sheet were included in the stress and relief factor data analysis as well as the variable data analysis. However, the final sample size for degree and specialization included 52 physicians.

Stress by degree

Physician burnout significance between MD and DO degrees is presented in **Table 1**. In this study, there is no real statistical significance between DO and MD degrees in emotional exhaustion, depersonalization, or personal accomplishment. According to the results, DO and MD physicians have essentially the same levels of burnout.

Table 1: Physician burnout significance between degrees			
	Emotional Exhaustion	Depersonalization	Personal Accomplishment
DO/MD	0.25	0.95	0.68

Stress by specialization

Physician burnout significance between specializations is shown in **Table 2**. Since a wide variety of specializations were reported, they were condensed into larger, representative groups in an effort to produce the most accurate results. Emergency room, radiology, and hospitalist specialties were combined into the Hospital Medicine (for short, ER) specialty, family medicine and pediatrics were combined into the Family Medicine (FM) specialty, Surgical Medicine (SM) combines all types of surgery and anesthesiology, and Internal Medicine (IM) includes gastroenterology, otolaryngology, oncology, cardiology, endocrinology, urology, and general internal medicine. Other Specialties (OS) is made up of a few specializations that could not be combined with any other area but generally seem to be low burnout specialties. OS includes dermatology, psychology, and OBGYN.

Two-tailed t-tests assuming unequal variance were performed for each combination of two specializations and burnout subscale. The two-tailed p-value is what is listed in Table 2. When comparing the average personal accomplishment scores for Hospital Medicine and Other Specialties, Other Specialties respondents tend to have significantly higher MBI personal accomplishment scores ($p = 0.006$), meaning that they experience lower amounts of burnout in that subscale compared to Hospital Medicine respondents. Other Specialties participants also exhibit higher personal accomplishment scores compared to Surgical Medicine participants ($p = 0.016$). When comparing the average depersonalization scores for Family Medicine and Surgical

Medicine respondents, Surgical Medicine participants show higher rates of depersonalization with their patients ($p = 0.043$).

Table 2: Physician burnout significance between specializations			
	Emotional Exhaustion	Depersonalization	Personal Accomplishment
IM/ER	0.308	0.795	0.232
IM/FM	0.091	0.056	0.684
IM/SM	0.493	0.566	0.284
IM/OS	0.109	0.156	0.119
ER/FM	0.623	0.158	0.081
ER/SM	0.734	0.444	1
ER/OS	0.580	0.320	0.006**
FM/SM	0.370	0.043*	0.129
FM/OS	0.871	0.529	0.154
SM/OS	0.365	0.090	0.016*

*p-value < 0.05 **p-value < 0.01

Stress by specialization and degree

Tables 3, 4, and 5 show the average emotional exhaustion, depersonalization, and personal accomplishment scores, respectively, separated by degree and by specialty, as well as the overall average scores for each degree (grand totals on y-axis) and for each specialty (grand totals on x-axis). These averages were statistically compared in **Table 6** which lists the two-tailed p-values for each degree/specialty and subscale combination. When analyzing the average personal accomplishment scores between Internal Medicine physicians with a DO degree (DOIM) and Hospital Medicine physicians with a DO degree (DOER), DO certified Internal Medicine physicians have a statistically higher feeling of personal accomplishment than Hospital Medicine physicians of the same certification ($p = 0.013$). MD certified Family Medicine specialists ($p = 0.003$) and MD certified Other Specialties physicians ($p = 0.0008$) also show statistically higher personal accomplishment scores compared to DO certified Hospital Medicine specialists.

Table 3: Average emotional exhaustion score for degree and specialization						
	Specialty					
Degree	ER/Hospital Medicine	Family Medicine	Internal Medicine	Other Specialties	Surgical Medicine	Grand Total
DO	20.20	16.80	30.00	30.00	20.50	23.50
MD	15.50	15.00	21.44	12.00	20.13	16.81
Grand Total	17.85	15.90	25.72	21.00	20.32	20.16

Table 4: Average depersonalization score by degree and specialization						
	Specialty					
Degree	ER/Hospital Medicine	Family Medicine	Internal Medicine	Other Specialties	Surgical Medicine	Grand Total
DO	9.80	3.40	7.60	1.00	5.50	5.46
MD	3.50	3.25	7.89	5.00	10.75	6.08
Grand Total	6.65	3.33	7.75	3.00	8.13	5.77

Table 5: Average personal accomplishment score for degree and specialization						
	Specialty					
Degree	ER/Hospital Medicine	Family Medicine	Internal Medicine	Other Specialties	Surgical Medicine	Grand Total
DO	36.40	41.20	43.60	47.00	36.00	40.84
MD	42.25	43.38	40.67	44.20	40.14	42.13
Grand Total	39.33	42.29	42.14	45.60	38.07	41.49

Stress and relief factors

After evaluating all of the data between degrees and specializations, I carried out t-tests to analyze the effects that stress-causing and stress-managing factors have on emotional exhaustion, depersonalization, and personal accomplishment scores on the MBI survey. **Tables 7 and 8** list each stress factor and relief factor category, respectively, the percent of physicians that responded with a factor in that specific category, and the average EE, DP, and PA burnout score for each factor. When comparing the average emotional exhaustion scores of time pressure and paperwork, statistically higher levels of emotional exhaustion are shown to be associated with the time pressure stress factor ($p = 0.048$). On-call/constant disturbances appeared to result in significantly higher EE scores compared to insurance ($p = 0.047$) and paperwork ($p = 0.037$).

Respondents that listed either administration or paperwork as their main stress-causing factor were shown to have lower feelings of depersonalization with their patients compared to those who listed patients/their family (administration: $p = 0.018$; paperwork: $p = 0.018$), time pressure (administration: $p = 0.025$; paperwork: $p = 0.034$), or on-call/constant disturbances (administration: $p = 0.037$; paperwork: $p = 0.041$) as their main stress-causing factor. Similar relationships occurred between respondents who listed patients/their family as their main stress factor and those who said time pressure caused the greatest stress. Both of these stress factors seemed to have a more negative impact on a physician's sense of personal accomplishment when compared to respondents that said insurance (patients/their family: $p = 0.027$; time pressure: $p = 0.047$) or administration (patients/their family: $p = 0.017$; time pressure: $p = 0.025$) was their primary stress factor. Physicians listing administration as their greatest stress factor also appeared to have a significantly increased average PA score compared to those who listed co-workers as causing the most stress in the workplace ($p = 0.049$).

As for relief factors, physicians that listed family/friends as their way of relieving stress have significantly higher EE scores on average when compared to those who have experience in the medical field ($p = 0.034$) or those who listed other, unconventional methods as their way of coping with stress ($p = 0.0053$). The unconventional methods that are highly specific to individual physicians also resulted in significantly lower EE scores when compared with physicians that primarily exercise ($p = 0.0002$) and physicians that practice hobbies to relieve stress ($p = 0.0094$). Even though burnout prevention is talked about extensively in the medical field, some physicians lack a method to managing their stress (answered: no stress-management), and thus have significantly higher EE levels compared to those doctors that have plenty of experience in medicine ($p = 0.023$). According to Table 8, majority of the physicians in the

Table 6: Physician burnout significance between degrees and specializations			
	Emotional Exhaustion	Depersonalization	Personal Accomplishment
DOIM/MDIM	0.359	0.944	0.339
DOIM/DOER	0.284	0.602	0.013*
DOIM/MDER	0.196	0.376	0.660
DOIM/DOFM	0.162	0.263	0.421
DOIM/MDFM	0.085	0.231	0.926
DOIM/DOSM	-	0.523	0.335
DOIM/MDSM	0.236	0.879	0.203
DOIM/MDOS	0.052	0.458	0.779
MDIM/DOER	0.876	0.631	0.122
MDIM/MDER	0.552	0.328	0.633
MDIM/DOFM	0.565	0.191	0.868
MDIM/MDFM	0.314	0.145	0.332
MDIM/DOSM	-	0.411	0.418
MDIM/MDSM	0.861	0.929	0.774
MDIM/MDOS	0.156	0.357	0.175
DOER/MDER	0.629	0.185	0.081
DOER/DOFM	0.661	0.093	0.093
DOER/MDFM	0.395	0.072	0.003***
DOER/DOSM	-	0.201	0.939
DOER/MDSM	0.992	0.707	0.198
DOER/MDOS	0.208	0.167	0.0008****
MDER/DOFM	0.893	0.979	0.745
MDER/MDFM	0.953	0.945	0.690
MDER/DOSM	-	0.578	0.306
MDER/MDSM	0.625	0.302	0.445
MDER/MDOS	0.687	0.685	0.460
DOFM/MDFM	0.763	0.946	0.423
DOFM/DOSM	-	0.307	0.370
DOFM/MDSM	0.648	0.182	0.642
DOFM/MDOS	0.440	0.492	0.245
MDFM/ODSM	-	0.120	0.332
MDFM/MDSM	0.333	0.146	0.185
MDFM/MDOS	0.327	0.345	0.622
DOSM/MDSM	-	0.382	0.496
DOSM/MDOS	-	0.735	0.294
MDSM/MDOS	0.143	0.334	0.085

*p-value < 0.05

***p-value < 0.005

****p-value < 0.001

sample use exercise as a stress-management strategy. However, when comparing DP levels to respondents who answered other methods and PA levels to those who listed faith/religion, exercise stress-management correlates with significantly higher levels of depersonalization than other methods ($p = 0.041$) and significantly lower levels of personal accomplishment in the workplace ($p = 0.0499$).

Stress Factor	% Occurrence (n=68)	Average EE Burnout	Average DP Burnout	Average PA Burnout
Insurance	14.71	16.2	5.3	43.9
Administration	5.88	21.5*	2.5	44.5
Patients/Their Family	14.71	24.7	10.4	38.1
Time Pressure	25	23.76	6.94	39.94
Life-and-Death Situations	2.94	8*	4.5*	39.5
Co-workers	8.82	15.33	7.33	39.5
On-Call/Constant Disturbances	17.65	24	7.25	41.08
Paperwork	5.88	14	2.25	39.75
Other	4.41	20	6.33	40

*Data excluded during data analysis because of a large variance.

Relief Factor	% Occurrence (n=66)	Average EE Burnout	Average DP Burnout	Average PA Burnout
Exercise	40.91	21.63	6.85	40.22
Faith	10.61	16.43	4	43.43
Family/Friends	9.09	26	5.67	39.17
Hobbies/Recreation	15.15	22.6	7.4	38.6
Experience	9.09	14.33	5.33	42.83
No Stress-Management	1.52	28.5	12.5*	36.5
Resting/Taking Breaks	9.09	17.17	5.5	44.33
Other Methods	4.55	9	4	42.5

* Data excluded during data analysis because of a large variance.

Stress relationships with other variables

Along with the MBI-HSS survey, a questionnaire featuring several variables was delivered to physicians. Just as degree, specialty, stress, and relief factors were statistically compared to EE, DP, and PA scores, t-tests were conducted between each variable and subscale score to determine if these variables contributed to any increase or decrease in burnout.

First, the results were separated by the physician's county of workplace. When comparing the different counties to each other based on burnout subscale, there was only one significant difference overall; the respondents from Horry county exhibited statistically higher personal accomplishment scores than the physicians from Florence county ($p = 0.012$).

Then the results were grouped by the average amount of sleep each physician received nightly. Choices included less than 4 hours, 4-6 hours, 6-8 hours, and more than 8 hours. Statistical analysis of these results revealed no significant differences between any combinations of categories when compared to EE, DP, or PA scores.

The average number of hours a physician works weekly is the third variable and answer choices included less than 40 hours, 40-60 hours, 60-80 hours, and more than 80 hours. Respondents that tended to work less than 40 hours a week had significantly lower emotional exhaustion on average when compared to the EE scores of those who work 40-60 hours per week ($p = 0.023$), 60-80 hours weekly ($p = 0.002$), or more than 80 hours per week ($p = 0.001$). Physicians who typically work 40-60 hours every week also had significantly lower EE scores compared to those who work more than 80 hours a week ($p = 0.024$). Respondents who listed that they work about 60-80 hours per week reported higher levels of depersonalization with their patients compared to those who work less than 40 hours every week ($p = 0.018$). Statistical analysis also showed that physicians who tended to work more than 80 hours a week had

significantly higher feelings of personal accomplishment than those who work 60-80 hours ($p = 0.007$) or physicians working 40-60 hours per week ($p = 0.018$).

The average length of a physician's morning routine also appears to have an effect on burnout scores. Categories for morning routine length are less than 30 minutes, 30-60 minutes, 60-90 minutes, or more than 90 minutes. Physicians who spend about 60-90 minutes getting ready in the morning revealed significantly higher EE scores compared to those who spend less than 30 minutes ($p = 0.040$) or more than 90 minutes ($p = 0.016$) on their morning routine. Physicians who listed that they take more than 90 minutes to get ready in the morning also tended to have greater feelings of personal accomplishment than those who spend less than 30 minutes ($p = 0.007$) or 30-60 minutes ($p = 0.020$) getting ready in the morning.

The final variable is marital status and it is separated into categories that include single, in a relationship, married, divorced, and widowed. Physicians who are in a relationship exhibited significantly higher levels of emotional exhaustion when compared to physicians that are widowed ($p = 0.046$) and physicians that are married ($p = 0.016$). Married physicians also had PA scores that were significantly greater than divorced respondents ($p = 0.035$).

DISCUSSION

Summary

In the past 35 years, burnout has become an extensively studied subject, especially in the medical field. This study aims to expand on the knowledge already gathered about burnout by investigating its statistical significance with physician degree, specialization, stress-causing and stress-managing factors, and other general variables such as average amount of sleep per night and marital status. Even though there appeared to be no significant differences in emotional exhaustion, depersonalization, or personal accomplishment scores between MD and DO certified

physicians (inconsistent with the hypothesis), there were significant differences between specialties. Consistent with one of the proposed hypotheses, can, & Copotoiu, S. (2011), and Sime, Quick, Saleh, & Martin (2007), I found that Surgical Medicine specialists exhibited some of the highest levels of burnout (particularly high DP and low PA scores). Hospital medicine physicians also exhibited significantly lower levels of personal accomplishment compared to Other Specialties physicians, resulting in relatively higher overall burnout which is partially consistent with the findings of Shanafelt et al. (2012) in that ER physicians generally have higher levels of burnout. However, the Hospital medicine specialists in this study exhibited one of the lowest average emotional exhaustion scores, just above Family Medicine specialists who had the lowest average EE score. These findings are both congruous with Sime, Quick, Saleh, & Martin (2007) in that emergency room doctors are more optimistic about their work and less emotionally exhausted, and inconsistent with Shanafelt et al. (2012) because Family Medicine physicians from this study do not exhibit some of the highest levels of burnout.

Stress and relief factor analysis showed several significant differences in the data collected. Patients and their family members and time pressure stresses resulted in significantly higher levels of burnout among physicians across all three subscales. Constant interruptions and being on-call also resulted in moderate levels of emotional exhaustion and depersonalization. Factors such as insurance companies, paperwork, and administration appear to correspond with lower stress and burnout levels in at least two subscales (administration and insurance companies are correlated with lower burnout in all three subscales). These findings, however, disprove my hypothesis that insurance companies cause higher levels of stress and burnout.

Even though most doctors believe that exercise is a form of stress relief, the results of this study seem to contradict this belief and the hypothesis proposed at the beginning of this study. Compared to physicians who use other unconventional methods of controlling their burnout, exercising physicians have significantly higher EE and DP scores, and lower PA scores compared to physicians who rely on faith and religion as a stress reliever. These findings about exercise are inconsistent with reports from Jackson (1999) and Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack (2009) who both determine that exercise lowers stress levels, whereas the statistical evidence of faith as a stress-reliever is supported by Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack (2009). Jackson (1999) further explains that many find competitive sports to be the most useful in stress management because they can promote the full range of human emotions and stresses of life, making competitive sports a way for physicians to “learn” how to deal with pressure and stress of work outside of the workplace in a social context. Thus, my results could represent physicians who exercise for the health aspect but lack the social, “learning” aspect. Jackson (1999) and Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack (2009) also indicate that making time for hobbies as well as family and friends can result in lower burnout levels, yet this study indicates the opposite. I don’t believe that these factors are not stress relievers nor do I believe that the results in this study are wrong. It is very likely that these other, unconventional methods that several physicians listed are so specific to their personality that they are highly effective in reducing their stress levels and burnout across all three subscales. So when other factors that are considered “typical” stress-relievers are compared to these highly specific methods, it appears that they do not actually relieve stress. Unlike in the other studies, Keswani, Taft, Coté, & Keefer (2011) determines that less-experienced physicians report higher levels of burnout on average compared to those physicians that have been

practicing for more than three years. These results support the significantly lower emotional exhaustion scores for experienced physicians in this study.

Other variable significance was greatly supported by previous articles. The results of this study show a positive correlation between the numbers of hours a physician works every week and emotional exhaustion which is held up in the studies conducted by Jackson (1999) and Popa, Raed, Purcărea, Lală, & Bobirnac (2010). Jackson (1999) states that self-care is a major stress-management strategy and encompasses many factors. It essentially shows that with an increase in the number of hours worked weekly, there is a decrease in the amount of time a physician has to spend on themselves, which can lead to higher burnout scores. This also supports the relationship between the amount of time a physician spends on their morning routine and burnout levels; those who spend more than 90 minutes getting ready in the morning have significantly lower EE scores and higher PA scores which are two factors associated with lower overall burnout. Popa, Raed, Purcărea, Lală, & Bobirnac (2010) indicates that work environment is also a fairly high risk factor. This is consistent with the significant difference in personal accomplishment level between Horry and Florence counties. Florence County is a hot spot for medical development, whereas Horry County only has certain areas that are well developed medically, which probably places more pressure on Florence physicians to be in the upper echelon because of the Florence's medical standing. Finally, when analyzing the data for the average amount of sleep a physician receives nightly, no significant differences were apparent. These results are inconsistent with the findings of Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack (2009) and Jackson (1999), both of whom consider sleep deprivation a major burnout risk factor.

Limitations and strengths

Several limitations can be noted of this study that may have an effect on the significance of these results. First, the Doctorfinder program that was used to obtain a list of physicians by specialty and zip code is not entirely up-to-date because it lists doctors that have moved practices and does not list doctors that are recently certified in the area. This is a limit because some doctors could not be found and others, who were not chosen at random, replaced them. In some cases, MD doctors replaced DO doctors due to the lack of doctors with DO degrees in Horry, Florence, Georgetown, and Charleston counties. Therefore, generalizations to all doctor populations must be done with caution. Second, some physicians did not answer certain question(s) on the MBI survey, specifically questions with the word “recipient” in the question. The use of the word “recipient” is to remain unbiased of profession since the version of the MBI used was the Human Services Survey and could be administered to any person in a human services position. This was explained in the directions of the MBI. This is a limit because it is impossible to assume an exact answer for the answering physician, and thus, the survey could not be used in this study. Third, an extra survey with general questions about their degree, specialty, stress factors, and stress management was distributed along with the burnout survey. This is a limit because if doctors know they are burned out, they may be less likely to fill out certain questions on the extra survey, or just neglect to fill it out entirely due to the fear of people being able to determine who they are, even though they were ensured that they would remain anonymous.

This study designates the first attempt (that I know of) to explore the significance between degree certification and burnout rates. Regardless of the lack of significance that degree

certification has in this study, I believe that there is potential for evidence of this theory in a larger sample size.

Implications

Despite the limitations of this study, there are several implications for burnout education and awareness. Since burnout is becoming highly prevalent among physicians, researchers have become curious as to how prevalent burnout is among medical students and residents, and more importantly how burnout can be controlled to reduce increased stress early in their careers.

Hillhouse, Adler, & Walters (2000) conduct a basic study to test if increased perceptions of stress are associated with increased levels of both job-and patient-related burnout which occurs later in the residency year. The authors found that increased levels of patient-related burnout were associated with greater mood disturbance, as well as poorer general health, while higher levels of job-related burnout were found among those individuals with the lowest ratings of clinical competency at the end of the residency year. Depression was found to increase in this group of residents regardless of self-reported decreases in hours worked across the year and increases in reported sleep.

Dyrbye et al. (2010) conducts a further study to measure medical student burnout rates and how that burnout can be a predictor for the consideration of dropping out of medical school as well as suicidal thoughts. The authors also conduct this study with the hope of understanding factors that might protect against burnout. The authors confirmed that resilient students, those students who showed no signs of burnout at one or both time-points, were less likely to experience burnout symptoms compared to vulnerable students, those who indicated signs of burnout.

Finally, Sargent, Sotile, W., Sotile, M. O., Rubash, & Barrack (2009) carry out a study to help identify some stress risk factors and protective factors. The authors found that sleep deprivation was common among residents and was positively correlated with every distress measure. Factors, such as making time for hobbies and limiting alcohol use, correlated with decreased dysfunction for residents.

These studies demonstrate the demands that medical students and residents are currently facing; demands that will only become more difficult and extensive over time. If these soon-to-be physicians are experiencing moderate or high burnout levels during their schooling, a prolonged period of time under such burnout levels will be extremely detrimental to the mental and physical health of the physician, and may also negatively affect the health of their patients. Even though experience does help alleviate some effects of burnout, if a student is so intensely subjected to increased feelings of emotional exhaustion, depersonalization, and decreased feelings of personal accomplishment, experience may not be able to help them in the long run. It is essential make students aware early in their studies of the risk factors and warning signs of increasing burnout as well as different ways to help prevent burnout from occurring. It may even be useful to suggest that students find an “unconventional” protective factor that is specific to their personality and interests. Burnout awareness and education will hopefully help students, residents, and physicians keep sight of why they do what they do in the midst of the many stresses they face on a daily basis (Meier & Beresford, 2006).

Suggestions for future research

Even though quite a bit of information is covered in this study, there are still topics to be explored in future studies. First, it can be conducted on a larger scale, including many more physicians from cities and rural areas in a specific region or across the entire United States.

Second, it can be determined if the number of hospitals that the physician is affiliated with affects stress levels. Third, the results from relief factors have already suggested that experience does have an effect on burnout levels, but it can be further investigated to see if the number of years in the medical profession positively correlates with stress management.

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