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Editor
Shawn M. Carraher
Cameron University
scarraher@cameron.edu

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ACADEMY OF HEALTH CARE MANAGEMENT JOURNAL

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LETTER FROM THE EDITOR

Welcome to the *Academy of Health Care Management Journal.* We are extremely pleased to be able to present what we intend to become a primary vehicle for communication of e-commerce issues throughout the world.

The Allied Academies is a non-profit association of scholars and practitioners in entrepreneurship whose purpose is to encourage and support the advancement of knowledge, understanding and teaching of e-commerce throughout the world. The *Academy of Health Care Management Journal* is a principal vehicle for achieving the objectives of the organization. The editorial mission of this journal is to publish empirical and theoretical manuscripts which advance the e-commerce initiatives. To learn more about the Academy, its affiliates, and upcoming conferences, please check our website: www.alliedacademies.org. We look forward to having you share your work with us.

Shawn Carraher, Editor
Cameron University
scarraher@cameron.edu

ARTICLES for Volume 4, Number 2

ADDRESSING EMPLOYEE OBESITY IN THE UNITED STATES

Marc C. Marchese, King's College
Bernard J. Healey, King's College

ABSTRACT

Employee health has become a major concern for employers, healthy employees benefit employers in two important ways. First, healthy employees have higher productivity than unhealthy employees and second, unhealthy employees use more medical services and drive up the health insurance costs. Due to the rising costs of health care a health survey was developed and administered to employees in a manufacturing operation in Pennsylvania to identify high-risk health behaviors practiced by employees of this business. The survey was distributed to eight hundred employees; the number of returned surveys was 406, a response rate of fifty-one percent. The survey was constructed to elicit general demographic information, health and lifestyle factors (including health conditions, tobacco usage, alcohol consumption, driving habits, and exercise), the impact of health issues on lifestyle, and participation in health promotion activities. As a result of this survey the employer has initiated a number of health-related activities to improve employee health status over the last three years. These activities can be summarized as intervention, informational, development of employee health advocates, insurance review, health surveys, lobbying, and utilization review.

INTRODUCTION

The Nation's Health (2005) reports that the growing obesity problem in the United States can cut the average life expectancy of Americans by as much as five years unless an aggressive campaign is begun to reduce weight

and increase physical activity in this country. Studies show that the majority of Americans are overweight (61% overweight, 20.9% obese) and that overweight individuals use health care services at higher rates than those of normal weight (10% to 36% higher). Given this trend and the large investment in health insurance that employers make (second only to wages), it appears that employer sponsored weight management programs could yield significant cost savings.

According to the Centers for Disease Control and Prevention (CDC) (2005) reports that over the last 20 years' the rates of overweight and obesity has increased dramatically. Overall, in the United States, 65% of adults are overweight and 30% meet the criteria for obesity. These two components are the triggers for hypertension, diabetes renal failure and several forms of arthritis and cancers.

A health survey was developed and administered to employees in a manufacturing operation in January 2003 to identify high-risk health behaviors practiced by and chronic diseases present in employees. The population was examined based on their demographic characteristics, the perceived impact of life style on health and their use of medical services. The goal was to raise the awareness of health issues among employees, identify areas how the employer could facilitate better health behavior among employees, and shift the locus of control to the employee to improve their health status.

Two high-risk health behaviors practiced by employees from this business is inattention to weight gains and physical inactivity as they grow older. This study attempted to discover the high-risk health behaviors of employees in a manufacturing plant in northeastern Pennsylvania and develop corporate health intervention programs strategies to reduce or eliminate these health behaviors.

The employer must deal with these problems by paying higher health premiums for employees or passing the increased costs on to their employees. If the company passes higher health costs onto their employees they risk losing well trained employees to their competition.

LITERATURE REVIEW

According to Centers for Disease Control (CDC) (2005) chronic diseases have replaced acute infections as the major causes of morbidity, mortality and ultimately, lost productivity for the worker afflicted with the chronic disease.. These chronic diseases have no cure and according to CDC (2005), over ninety million Americans live with chronic diseases. The medical care costs of people with chronic diseases account for more than 75 percent of the nation's $1.4 trillion dollars spent on medical care which currently represents 14 percent of Gross Domestic Product (GDP) in this country.

The Framingham Study, a 50 year study of chronic diseases which ended in 1997, claims that avoiding tobacco, eating a sensible diet and walking only 15 miles each week will help workers avoid expensive chronic diseases.

According to the Health Affairs web site, health care spending will constitute 18.7% of Gross Domestic Product by 2014. As health care costs continue to rise above the inflation rate, everyone from state and federal legislators to the owners of businesses are struggling to reduce the costs associated with delivering health care services to their respective constituents.

Dr. Gerberding, Director of the CDC, (2005), stated that we need to be clear about one thing, overweight and obesity are critically important health threats in this country. But it is difficult to obtain exact numbers of individuals who are overweight or obese because neither health problems are currently reportable to public health authorities. The CDC does, however, report that a very good estimate of the overweight problem in this country through random surveys is the best we have available. Overall, in the United States, 65% of adults are overweight and 30% meet the criteria for obesity. These two components are the triggers for many chronic diseases like hypertension, diabetes renal failure and several forms of arthritis and cancers.

Grossman (2004) argues that employees do not leave their increasing weight at home in the morning when they come to work. This extra weight is having serious ramifications relating to health care costs, productivity, morale and potential employee discrimination.

Two other important findings in a similar study conducted by Haynes and Smith (1997) were that participants of employer wellness programs were that participants of these programs were more likely to incur higher health care costs than non-participants of the study at least during the beginning years of the start of such a program. Another finding of the Haynes and Smith study was that higher income earners have significantly lower health care claims than those earning lower income.

Getting employees to participate in employee wellness is extremely difficult. Busbin & Campbell (1990) found extremely low participation rates in wellness programs offered at the worksite. They found less than 20% of employees participated in these programs at any given time. They used the term self selectivity which means that employees already in good health would participate and those who needed health changes in their life were slow to participate in these programs. They saw a marketing approach to wellness programs as a necessary prerequisite of success. There needs to be a model developed from the successful programs in hopes of replicating the components necessary for success in other wellness programs throughout the country.

METHODOLOGY

A health survey was developed and administered to employees of a manufacturing operation in Pennsylvania to identify high-risk health behaviors practiced by employees of this business. The survey was distributed to eight hundred employees; the number of returned surveys was 406, a response rate of fifty-one percent. The survey was constructed to elicit general demographic information, health and lifestyle factors (including health conditions, weight-related issues, tobacco usage, alcohol consumption, driving habits, and exercise), the impact of health issues on lifestyle, and participation in health promotion activities.

RESULTS

Of the 406 survey respondents, most were male (65%), married (60%), Caucasian (98%), and between 35 to 54 years of age (62%). In terms of education, about half of them had a high school diploma (51%), with a small percentage having a four-year college degree or higher (13%). In terms of income, more than half had incomes $50,000 or less (69%). Lastly, in terns of length of service the mean was 13.5 years with a range of 0 (new hire) to 36 years.

The most commonly accepted measure in the U.S. of obesity is the Body Mass Index (BMI). According to the Centers for Disease Control and Prevention (2000), the standard for being classified as overweight is a BMI greater than 25 and the standard for being classified as obsese is a BMI greater than 30. The respondents to the survey indicate both their height and weight. Using the following formula (CDC, 2000), BMI's were calculated for all respondents:

BMI = Weight (pounds) / Height (inches) / Height (inches) x 703

Based upon this formula, only 34% of the respondents had a BMI less than 25. Approximately 40% of the respondents fell into the overweight category and another 26% were classified as obese.

Far and away the employees perceived themselves to be in good to excellent health. Table 1 reports the responses to the question:

	Number of Responses	Percentage
Excellent	67	16.50%
Very good	132	32.51%
Good	156	38.42%
Fair	38	9.36%
Poor	4	0.99%
No response/don't know	9	2.23%

The two major chronic health conditions reported were high blood pressure, 17.7% (72 reporting) and high cholesterol, 12.3% (50). Employees were evenly distributed in terms of their exercise habits. Thirty three percent (33.3%, 135) reported no exercise activity. Another 33.5% reported that they engaged in one or two episodes of vigorous (aerobic) physical activity that lasted 20 consecutive minutes or more. Twenty nine percent (29.6%, 120) reported three or more episodes. The last group is the only group that may reap the health benefits of regular exercise.

Many more employees, 47.5% (193) believed that they should increase either the duration or number of workouts they engage in. Approximately 34% believed no change was necessary in their exercise routine while 11% reported they did not know what action was needed. Lack of time, 50.7%, 206, was the most common barrier given for not increasing the amount of exercise engaged in. The most common other reasons were: lack of exercise facilities, 14.3%, 58, and lack of encouragement or exercise companions, 14.3%, 58. A primary question is can an employer create a weight management program that can overcome these barriers?

Overall the respondents noted little impact of their health on their lifestyle. Responding to the question: Does your physical health limit your participation in moderate activities (climbing stairs, moving furniture, vacuuming, bowling, golfing, etc)?, 75.6% or 307 individuals noted no limitation. Eighty people (19.7%) noted their lifestyle was limited a little or some of the time while eleven (2.7%) individuals reported that health limitations impacted their lifestyle most or all of the time.

Reinforcing this perception were the responses to the question: How many days during the last year was your physical health not good? Employees reported that on average they experienced 8.85 days per year (2.42% of the year) of poor health. Responses to the question: During the past 30 days, for about how many days did your physical health keep you from doing your usual activities, such as self-care, work, or recreation?, produced a mean of 1.32 days (4.40% of the month).

Table 2 reports the use of physician, emergency, and inpatient services in the last year, "How many times have you seen a physician, received emergency room care, or been admitted to a hospital during the past 12

months?" The table demonstrates considerable variation in use of physician services but little in emergency or inpatient. The later is to be expected as the vast majority of Americans do not require emergency or inpatient services in a given year.

Table 2: Use of Medical Services

	MD	Percentage	ER	I/P
Zero times	67	16.50%	318	358
One time	81	19.95%	56	7
Two times	88	21.68%	12	3
Three times	43	10.59%	3	3
Four times	39	9.61%	0	9
More than four times	72	17.73%	0	10
No response	16	3.94%	17	16

After obtaining information on demographics, health perception, and use of medical care, the survey elicited information on the willingness of employees to participate in health promotion activities. Responses to: Are you willing to participate in health promotion (education and/or health screenings) activities? are shown below.

	Number of Responses	Percentage
Yes	134	33.01%
Not sure, depends onoffering, timing, &/or cost	189	46.55%
No	68	16.75%
No response	15	3.69%

Given that almost 80% of employees expressed a willingness or conditional willingness to participate in health promotion activities, a follow-up question asked: What types of health promotion activities would you participate in?

	Number of Responses	Percentage
Read pamphlets and written materials	193	47.54%
Utilize health screenings test	171	42.12%
Workout with exercise groups	143	35.22%
Attend talks by experts (seminars)	141	34.73%
Watch films and videos	130	32.02%
Utilize Employee Assistance Programs	103	25.37%
Attend classes and courses	80	19.70%
Attend and participate in discussion groups	75	18.47%
Other:	3	0.74%

Discussion of health promotion activities

Employee commitment to health promotion was assessed via their willingness to share costs with the company. Clearly cost was a major factor for many respondents as the table demonstrates only 34.7% of employees were ready to assume part of the cost of health promotion activities.

Who is obese? Table A demonstrates that 67% of this population is overweight, this compares unfavorably with rates in the general population. The CDC reports that 61% of Americans were overweight in 2001 including 20.9% with BMIs greater than or equal to 30. The males in this population are much more prone to being overweight than females as well as exceeding the national standard for obesity.

	Number of Responses	Percentage
Not interested in any health promotion activities	37	9.11%
Interested, but unwilling to contribute to cost	133	32.76%
Interested and willing to contribute to cost	141	34.73%
No response	95	23.40%

Table A: Gender			
	Males	Females	Total
Under 25	58	67	125
25 - 29.99	118	35	153
More than 30	78	22	100
Total	254	124	378
Under 25	22.8%	54.0%	33.1%
25 - 29.99	46.5%	28.2%	40.5%
More than 30	30.7%	17.7%	26.5%

Table B: Age						
	24 & less	25-34	35-44	45-54	55 up	Total
Under 25	12	23	44	27	19	125
25 - 29.99	6	20	43	51	35	155
More than 30	3	16	37	29	14	99
Total	21	59	124	107	68	379
Under 25	57.1%	39.0%	35.5%	25.2%	27.9%	32.9%
25 - 29.99	28.6%	33.9%	34.7%	47.7%	51.5%	40.9%
More than 30	14.3%	27.1%	29.8%	27.1%	20.6%	26.1%

Table C: Income							
Up to	$19,999	$29,999	$39,999	$49,999	$59,999	>$60,000	Other
Under 25	13	25	15	22	6	23	21
25 - 29.99	6	25	30	23	16	28	27
>30	7	20	13	21	11	17	10
Total	26	70	58	66	33	68	58
Under 25	50.0%	35.7%	25.9%	33.3%	18.2%	33.8%	36.2%
25 -29.99	23.1%	35.7%	51.7%	34.8%	48.5%	41.2%	46.6%
> 30	26.9%	28.6%	22.4%	31.8%	33.3%	25.0%	17.2%

Table B shows obesity increase with age. The increase in weight associated with age does not explain why more males are overweight. A chi-square test found no statistical difference in the age distribution of men and women (chi square = 2.27, probability = 0.8096).

Table C shows low income people, those with incomes under $30,000, have a lesser occurrence of obesity but no clear trend emerges as income increases. Obesity increases and decreases with income before reaching the highest prevalence in the $40,000 to $59,999 income group. Obesity then falls with further income increases.

Table D shows unmarried couples and the widowed have less obesity than other groups - target interventions to the schedules of married, separated and single lifestyles.

Table E shows that college graduates are most likely to fall into the normal weight range and most likely to be obese. <Sedentary jobs> National statistics show obesity diminishes as education increases, 27.4% of those that did not complete high school are obese compared to 23.2% of high school graduates and 15.7% of college graduates (CDC). This population does not reflect this trend in that the rate of obesity increases for high school and college graduates.

Table D: Marital Status					
	Married	Unmarried Couple	Divorced/ Separated	Single	Widowed
Under 25	69	10	17	26	3
25 - 29.99	99	4	18	30	4
> 30	63	1	16	19	0
Total	231	15	51	75	7
Under 25	29.9%	66.7%	33.3%	34.7%	42.9%
25 - 29.99	42.9%	26.7%	35.3%	40.0%	57.1%
> 30	27.3%	6.7%	31.4%	25.3%	0.0%

Table E: Education						
	11 or less	HS Grad	Some college	College Grad	Post-Grad	Other
Under 25	7	50	43	17	6	2
25 - 29.99	16	90	36	6	7	0
> 30	7	53	25	12	1	1
Total	30	193	104	35	14	3
Under 25	23.3%	25.9%	41.3%	48.6%	42.9%	66.7%
25 - 29.99	53.3%	46.6%	34.6%	17.1%	50.0%	0.0%
> 30	23.3%	27.5%	24.0%	34.3%	7.1%	33.3%

ANOVA

To gauge the potential effectiveness of intervention strategies, it was necessary to determine if any relationships exist between BMI and demographic factors, health and lifestyle perceptions, exercise and attitudes toward health improving behaviors, and use of medical services.

Table F shows a significant difference exists between the five groups, that is, individuals with higher BMIs have a lower perception of their health status.

The ANOVA analysis shows that the mean of those who perceive themselves to be in excellent health does not fall within the 95% confidence interval of those who perceive themselves as in very good or good health or failed to respond. ANOVA has found a significant difference between groups. Likewise those that see themselves as in very good health have a mean that does not fall within the 95% confidence interval of those who perceive themselves in good health. In all other comparisons, the mean for each group falls within the confidence interval of the other groups.

The comparison of those with excellent health and those reporting fair health are interesting as the individual with the highest BMI (49.13) reports excellent health and the individual with the lowest BMI (17.89) reports fair health. Deleting these two cases produces a statistical difference between those that perceive themselves as excellent and those that perceive themselves in fair health. The results show that 95% of those who perceive themselves in excellent health have BMIs ranging from 23.8 (23.7, normal) to 26.1 (25.5, slightly overweight). Individuals who perceive themselves in very good health 26.1-27.8, good, 28.1-29.7, fair, 26.0-30.2. Translation: Those reporting excellent health range from normal weight to eight pounds overweight, those reporting very good, nine to 19 pounds overweight, and good, 22 to 34 pounds overweight. These categories are mutually exclusive. Those who perceive themselves in fair health have the greatest range, ranging from eight to 38 pounds overweight.

Table F: Perception of Health

Perception of Health	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval		Minimum	Maximum
					Lower	Upper		
Excellent	65	24.9751	4.5667	.5664	23.8436	26.1067	18.31	49.13
V. Good	123	26.9904	4.7022	.4240	26.1511	27.8297	18.79	41.05
Good	146	28.8962	5.0742	.4199	28.0662	29.7262	20.23	43.82
Fair	35	28.1307	6.1279	1.0358	26.0257	30.2357	17.89	42.91
Other	10	27.0696	5.0843	1.6078	23.4325	30.7067	19.84	35.40
Total	379	27.4863	5.1490.	2645	26.9663	28.0064	17.89	49.13
		Sum of Squares	df	Mean Square	F	Sig.		
Between Groups		746.632	4	186.658	7.527	.000		
Within Groups		9274.914	374	24.799				
Total		10021.546	378					

The relationship between BMI and health perception maybe more fully understood by examining the following Pivot Table.

	Under	Normal	Over-weight	Obese	Other	Total
Excellent	50.00%	26.83%	17.42%	4.04%	7.69%	16.54%
Very good	0.00%	37.40%	30.32%	30.30%	30.77%	32.35%
Good	0.00%	23.58%	43.23%	50.51%	38.46%	38.52%
Fair	50.00%	9.76%	6.45%	12.12%	11.54%	9.38%
Poor	0.00%	1.63%	0.00%	1.01%	3.85%	0.99%
Other	0.00%	0.81%	2.59%	2.02%	7.69%	2.23%
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

This table shows that one's perception of being in excellent or very good health declines as an individual moves from normal weight to overweight and to obese. Likewise, the perception of good health, an inferior perception, increases with the BMI classification. Obese individuals are also the most likely to perceive themselves as in fair health. This table demonstrates the potential opportunity to communicate to employees the relationship between weight and perceived health.

Table G indicates that individuals with higher BMIs are more likely to express an interest in increasing their physical activity.

Table G: Desire to Increase Exercise

Desire to Increase Exercise	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval		Minimum	Maximum
					Lower	Upper		
Yes	184	28.0066	5.2711	.3886	27.2399	28.7733	17.89	43.82
Don't know	44	28.2826	4.8557	.7320	26.8063	29.7589	19.97	39.33
No	130	26.3970	4.9640	.4354	25.5356	27.2584	18.31	49.13
Total	358	27.4560	5.1609	.2728	26.9196	27.9925	17.89	49.13
		Sum of Squares	df	Mean Square	F	Sig.		
Between Groups		231.620	2	115.810	4.432	.013		
Within Groups		9277.196	355	26.133				
Total		9508.816	357					

Likewise Table H demonstrates that individuals with high BMIs are more likely to express an interest in losing weight.

Table H: Desire to lose weight

Desire to Lose Weight	N	Mean	Std. Dev.	Std. Error	95% Confidence		Minimum	Maximum
					Lower	Upper		
Yes	17	29.8217	5.1593	.3911	29.0497	30.5937	18.79	49.13
No	18	25.1465	4.1024	.3016	24.5514	25.7416	17.89	42.91
Other	18	29.2242	3.9707	.9359	27.2496	31.1987	20.67	35.51
Total	37	27.4990	5.1534	.2654	26.9771	28.0209	17.89	49.13
		Sum of	Df	Mean	F	Sig.		
Between		2016.140	2	1008.07	47.307	.000		
Within Groups		7969.610	374	21.309				
Total		9985.749	376					

Table I demonstrates that high BMI individuals use physician services at higher rates than those with lower BMIs. This is an important finding as part of our objective was to identify health conditions that could be altered to improve health status and reduce health care outlays. The table shows that a leveling off of BMI occurs at three physician visits per year but the standard deviation continues its upward climb throughout the table (with the exception of five). The increase use of medical service may be attributable to the variance in BMI. Neither ER visits nor inpatient utilization was correlated with BMI.

As changing behaviors is the prime objective of this survey and intervention, Table J presents disconcerting information. That is the obese do not see any limitation on their lifestyle.

Table I: Physician Visits

Physician Visits	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval		Minimum	Maximum
					Lower	Upper		
None	67	25.9498	3.6807	.4497	25.0520	26.8476	18.89	35.78
One	77	26.9712	4.4874	.5114	25.9527	27.9898	19.67	43.27
Two	81	28.4287	5.6253	.6250	27.1849	29.6726	18.31	49.13
Three	41	27.0439	4.9036	.7658	25.4961	28.5917	18.99	37.93
Four	36	28.2886	5.6508	.9418	26.3766	30.2006	19.42	40.17
Five	15	26.3240	5.1709	1.3351	23.4605	29.1876	20.55	35.26
Six	19	29.7984	6.2406	1.4317	26.7906	32.8063	18.79	43.82
Seven	34	28.0507	6.2653	1.0745	25.8646	30.2367	17.89	41.84
Total	370	27.4597	5.1588	.2682	26.9323	27.9871	17.89	49.13
		Sum of Squares	Df	Mean Square	F	Sig.		
Between Groups		414.151	7	59.164	2.277	.028		
Within Groups		9406.215	362	25.984				
Total		9820.366	369					

Table J: Impact on Lifestyle

Limitation on Lifestyle	N	Mean	Std. Dev.	Std. Error	95% Confid.ence Interval		Minimum	Maximum
					Lower	Upper		
None	292	27.2451	5.0918	.2980	26.6586	27.8315	17.89	49.13
Little	41	28.5262	5.3873	.8413	26.8257	30.2266	18.99	41.05
Some	41	27.8159	5.3301	.8324	26.1336	29.4983	19.20	42.91
Total	374	27.4481	5.1537	.2665	26.9241	27.9721	17.89	49.13
		Sum of Squares	df	Mean Square	F	Sig.		
Between Groups		65.235	2	32.617	1.230	.294		
Within Groups		9841.754	371	26.528				
Total		9906.989	373					

The lack of impact on lifestyle exhibited in Table J may explain the apparent unwillingness of high BMI individuals to participate in health promotion activities. Table K shows no difference between those willing to participate in health promotion activities, those unsure, and those unwilling to participate based on BMI. A simple review of means shows those who would consider these activities have higher BMIs than those who would not. This is logical, those with an average BMI of 26.49 are in better shape than the majority of their coworkers, are only slightly above the BMI overweight threshold and may see no reason to participate in health promotion activities. Still insignificant

Table K: Willingness to Participate in Health Promotion Activities

Willing to Participate	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval		Minimum	Maximum
					Lower	Upper		
Yes	126	27.4620	4.8876	.4354	26.6003	28.3237	17.89	43.82
Depends	179	27.8752	5.6017	.4187	27.0490	28.7015	18.79	49.13
No	64	26.4918	4.4127	.5516	25.3895	27.5941	18.31	35.94
Total	369	27.4942	5.1838	.2699	26.9635	28.0248	17.89	49.13

	Sum of Squares	df	Mean Square	F	Sig.		
Between Groups	90.429	2	45.215	1.689	.186		
Within Groups	9798.336	366	26.771				
Total	9888.765	368					

Table L analyzes whether individuals would be willing to participate in an employer sponsored exercise group. The response was not encouraging, there is no statistical difference between groups suggesting that employer sponsored exercise groups are not attractive to individuals with high BMIs.

Table L: Participation in Employer Sponsored Exercise Group								
Exercise Group	N	Mean	Std. Dev.	Std. Error	95% Confid.ence I nterval		Minimum	Maximum
					Lower	Upper		
No	242	27.3227	4.8504	.3118	26.7085	27.9369	17.89	42.91
Yes	137	27.7754	5.6450	.4823	26.8217	28.7292	18.79	49.13
Total	379	27.4863	5.1490	.2645	26.9663	28.0064	17.89	49.13
		Sum of Squares	df	Mean Square	F	Sig.		
Between Groups		17.931	1	17.931	.676	.412		
Within Groups		10003.615	377	26.535				
Total		10021.546	378					

A major factor considered in assessing people's willingness to change their health behaviors is their willingness to invest their own money in achieving a change. Table M analyzes the responses to the question: Would you be willing to share costs with the company for some health promotion activities? The results show no statistical significance between groups, that is, changes in BMI are not correlated with an individual's willingness to share the cost of health promotion activities.

Table M: Willingness to share cost of health promotion activities								
Cost Sharing	N	Mean	Std. Deviatio n	Std. Error	95% Confidence Interval		Minimu m	Maximu m
					Lower	Upper		
No interest	36	27.7048	5.3414	.8902	25.8975	29.5120	18.31	42.91
Unwilling	126	27.6572	5.9401	.5292	26.6099	28.7045	17.89	49.13
Willing	134	27.6993	4.8949	.4229	26.8629	28.5357	18.99	43.27
Total	296	27.6821	5.3980	.3138	27.0646	28.2995	17.89	49.13
		Sum of Squares	df	Mean Square	F	Sig.		
Between Groups		.136	2	6.8E-02	.002	.998		
Within Groups		8595.791	293	29.337				
Total		8595.927	295					

The ANOVA outputs demonstrate recognition among the workforce that obesity has negative impacts on their health but the individuals surveyed do not see this as limiting their lifestyle. Among overweight individuals there is a desire to lose weight and increase physical activity. From the employer standpoint there may be a financial incentive to encourage both activities as those with high BMIs utilize physician visits at higher rates than lower BMI employees.

DISCUSSION

Based on the survey results the employer and employees have initiated a number of health-related activities to improve employee health status over the last three years. These activities can be summarized as intervention, informational, development of employee health advocates, insurance review, health surveys, lobbying, and utilization review. The vast majority of activities have been undertaken in the first two areas. Intervention activities were designed to facilitate physical activity among employees, identify specific health risks for individuals, and provide information to individuals on how to improve their health status.

As a result of this activity a group of employees enrolled and completed an eight-week fitness program that reduced their average weight by 11 pounds and increased their self esteem. Participants continue to build upon the fitness skills they acquired as evidenced by routine progress reports and the employer reports substantial return on its investment in the program. The results suggest that intervention and achieving the desired results will be difficult due to the perceived lack of impact on lifestyle and the unwillingness of overweight employees to participate in health promotion activities, exercise in organized workout groups, or share the cost of health promotion programs.

This is unfortunate because obesity is a precursor to a number of chronic diseases that are escalating the cost of proving health services to employees, reduces overall productivity for the company making the company less competitive and increases morbidity and mortality for the employees of this company.

The rapid increase in obesity in this country has been called an epidemic that is moving into a “crisis” stage I believe that a health crisis is a

terrible thing to waste. This crisis needs to be exploited with proper leadership, collaboration and employee incentives to move from crisis to opportunity to remove one of the main causes of chronic disease in our country.

A health survey was developed and administered to employees in a manufacturing operation in January 2003 to identify high-risk health behaviors practiced by and chronic diseases present in employees. The population was examined based on their demographic characteristics, the perceived impact of life style on health and their use of medical services. The goal was to raise the awareness of health issues among employees, identify areas how the employer could facilitate better health behavior among employees, and shift the locus of control to the employee to improve their health status.

The survey was constructed to elicit general demographic information, health and lifestyle factors (including health conditions, tobacco usage, alcohol consumption, driving habits, and exercise), the impact of health issues on lifestyle, use of medical services, and participation in health promotion activities. The goal was to identify relationships between these factors that could be developed to improve the employee's health.

From the data analysis it was apparent that obesity is a primary health problem in this population, one that could be impacted by intervention and with successful intervention reduce future health care outlays. The average BMI for this group of employees was 27.5 placing them in the "prone to health risks" category.

Those at highest risk are over 30: males, 25-54, $40,000-59,999, divorced/married, college grads (white collar/non-physical – also more likely to be under 25).

Intervention strategies include: given that educated, high income, males are obese, an educational/ informational campaign could be an effective outreach and behavior change stimulus. Accordingly, the results of this survey were used to build a six part voice narrated Web-CT power point slide presentation on the most frequently practiced high-risk health behaviors by employees of this company. These slides are available to employees and their

dependents 24 hours a day and seven days a week. The effect of this intervention will be evaluated with a second survey next year.

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AN ERP-BASED PROCESS PERFORMANCE MEASUREMENT APPROACH IN AN OUTPATIENT CLINIC

Markus Kohlbacher, Graz University of Technology
Andreas Gautsch, KNAPP Systemintegration
Hartwig Zenz, Steiermaerkische Krankenanstaltenges
Werner Leodolter, Steiermaerkische Krankenanstaltenges

ABSTRACT

In this paper we show a very efficient way for continuous performance measurement of the outpatient treatment process (from a patient perspective) as realized in a public-funded Austrian hospital. Performance measurement focuses on time and efficiency of the process. In this hospital the outpatient treatment process is supported by an ERP system (SAP) which already collects process data of every patient going through the process, primarily for reasons of accounting and invoicing. We use this already recorded data, define performance indicators and calculate and visualize the resulting process performance. We also compare our ERP approach with other data collection techniques.

KEYWORDS: business process management, ERP, process control, collection of performance data, nonfinancial metrics

INTRODUCTION

Many health care institutions are confronted with long waiting times, delays, and queues of patients. Typical questions challenging hospital managers include: How should we optimally allocate our limited resources? How much exam rooms do we need? How much physicians and support staff

do we need? If we increase or decrease the amount of exam rooms and/or staff, how would this effect patient waiting time, the length of a medical treatment and the total time spent in clinic by patient? (Isken et al., 2005) To improve patient satisfaction, the performance of key processes has to be improved (Torres & Guo, 2004). There is no doubt that health care institutions need to become high performers. In order to gain high performance, the organization has to determine its performance indicators, measure its performance, derive the performance gap and initiate actions to close the gap (Jennings & Westfall, 1994). Improving the quality of health services means to focus on the patient and his needs. "*In virtually every industry, companies of all sizes have achieved extraordinary improvements in cost, quality, speed, profitability, and other key areas by focusing on, measuring, and redesigning their customer-facing and internal processes"* (Hammer, 2007b). Assessing processes by means of performance indicators is a prerequisite for process control and serves as a basis for process optimization. Sometimes business processes are fully supported by an operative system like an enterprise resource planning (ERP) system collecting data from which process performance information can be extracted – automatically and free of additional cost. This study treats process performance measurement by using an ERP system and focuses on non-financial metrics.

THEORETICAL BACKGROUND

What is a Business Process?

A business process is a sequence of steps which transform inputs into outputs: It is customer focused, i.e. is activated by market and (external or internal) customer needs, value adding, i.e. creates value which is appreciated by the customer, and has a process owner who has the end-to-end responsibility for the whole process. Furthermore it has access to all necessary resources and information (Schantin, 2004). (Note: For reasons of simplicity we often use the word process when talking about business process).

Process Orientation

Process orientation means focusing on business processes ranging from customer to customer instead of placing emphasis on functional structures (Reijers, 2006). Process orientation does not only work for process industry, but can be applied to service industries as well (Davenport, 1993). There is empirical proof that hospitals with a high degree of process orientation are moderately but significantly more efficient (Vera & Kuntz, 2007).

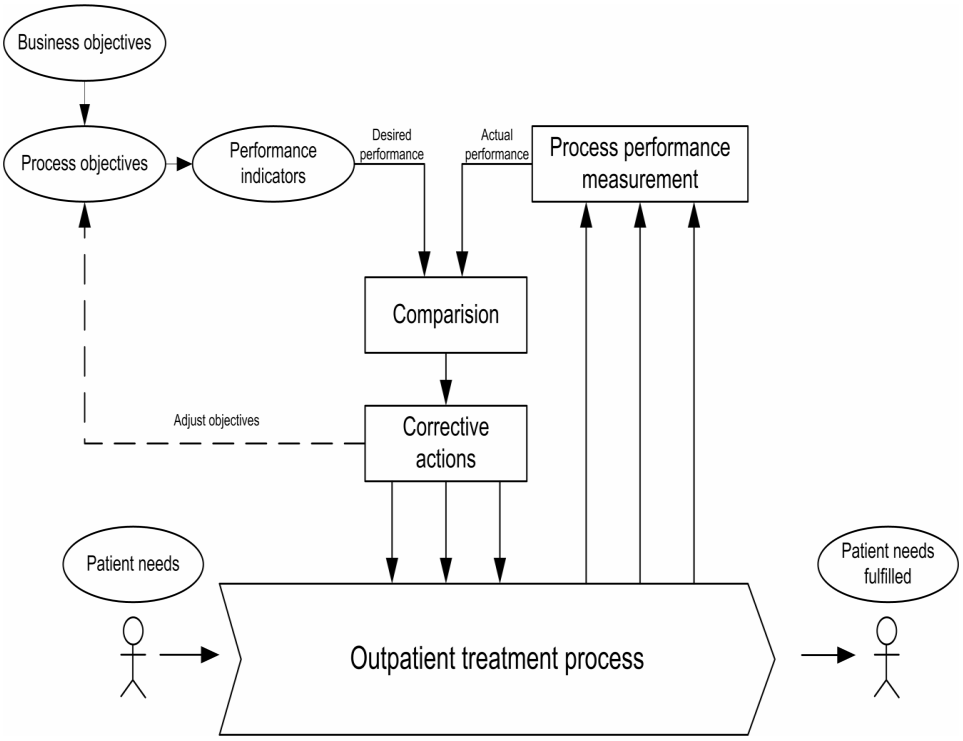
Business Process Management

Business process management deals with how to manage processes on an ongoing basis (Armistead & Machin, 1997). This management approach has gained much advertence in industrial engineering and management literature, but less in public sector management literature (Gulledge & Sommer, 2002). Business process management does not only incorporate the discovery, design, deployment and execution of business processes, but also interaction, control, analysis and optimization of processes (Smith & Fingar, 2003).

Process Performance Measurement and Process Control

Measurement and Management are not separable (Lebas, 1995). Business process management integrates the measurement and also ongoing improvement of business processes (Harmon, 2003). By focusing measurement on processes rather than functions, alignment and common focus across separate organizational units can be achieved (Hammer, 2007a). Implementing measures and taking corrective actions are operating precepts of process management (Melan, 1989). With the help of measurement, a process can be controlled. Process control is an important part of business process management. It is a continuous course of action and consists of several steps (see Figure 1).

Figure 1: Process control of the outpatient treatment process



First, one has to derive process objectives from the business objectives. This is crucial because business processes have to be aligned to corporate strategy (Ndede-Amadi, 2004). Second, performance indicators have to be derived from process objectives. Third, process performance data has to be collected. Fourth, actual and desired performance has to be compared and finally, if there is a performance gap, corrective actions have to be carried out.

ERP Systems in Healthcare Institutions

Healthcare organizations are complex and information intensive organizations which require an integrated clinical and business management information system. The integration of clinical and business management was hardly achieved by hospital information systems in the 1980s and the 1990s. ERP software (also often referred to as enterprise systems) drastically changed corporate IT, and health care organizations were affected equally (Stefanou & Revanoglou, 2006). ERP systems are designed to solve the fragmentation of information in large business organizations (Davenport, 1998). A main characteristic of an ERP system is that it attempts to integrate all departments and functions of an organization onto a single computer system (Botta-Genoulaz & Pierre-Alain, 2006). An ERP system has a modular structure and the functions of the system are integrated. When data is entered into one function, this data is immediately available to all associated functions (van Merode et al., 2004).

THE CASE STUDY CLINIC

The hospital used in our study is the Landeskrankenhaus Bruck/Mur, located in the province of Styria, Austria. It is both an inpatient and outpatient clinic and provides a broad range of health care services. The hospital is part of Steiermaerkische Krankenanstaltengesellschaft m.b.H (KAGes), a public owned holding company with about 20 hospitals in Styria. In 2006 the outpatient clinic averaged about 32.000 patient visits. Immediately after the clinic entrance there are three reception counters. The outpatient clinic consists of the following departments: surgery, accident surgery, internal medicine, eye ambulance, neurology and radiology. Every department has some organizational entities (OE), e.g. the radiology department has the OEs X-ray, computer tomography, mammogram etc. Each organizational entity has its own treatment rooms. The hospital is staffed by several professionals, like physicians, nurses, medical assistants, medical technologists etc. In 1999 the hospital started to introduce SAP as an ERP system which should displace its

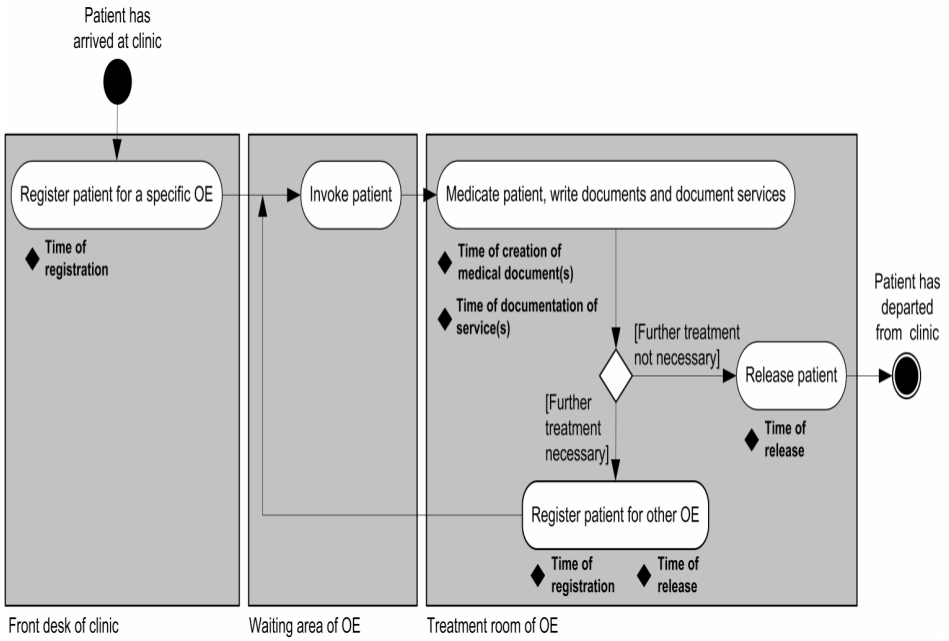
legacy systems. The rollout of the system was completed in 2000. The system fully supports both inpatient and outpatient treatment processes of the hospital.

REALIZATION OF PROCESS PERFORMANCE MEASUREMENT

The Generic Outpatient Treatment Process

While the details of the outpatient treatment process from the patient's perspective vary by specific application (e.g. emergency vs. ordinary patients), a generic process might include the following features (see Figure 2): The patient (P) arrives at the clinic either with a scheduled appointment or as a walk-in patient. Upon arrival, P is registered for a specific OE at the reception counter. After that P moves into the waiting area of this OE and has to wait for invocation into the treatment room. There P is examined and/or medicated by the medical staff, which then writes medical documents and also records the provided services. Depending on the results the medical staff decides whether the patient needs to visit another OE for further treatment or not. If further treatment is necessary, the medical staff registers the patient for the next OE and P is released from the current OE. P moves to the waiting area of the next OE where the treatment process starts again. If no further treatment is necessary, P is released and departs from the clinic. Generally one can say that patients proceed through a series of visits in different organizational entities. The whole outpatient clinical session starts when P arrives at the clinic and ends when P departs.

Figure 2: The generic treatment process of the outpatient clinic



A simple example of the outpatient treatment process could look like this: A walk-in patient with a broken finger enters the clinic and goes to the reception counter where P is registered for the OE "Initial treatment" of the department "Accident surgery". After registration P moves to the waiting area. After some time P is invoked and enters the treatment room of the OE "Initial treatment". P is examined and the physician decides to send P to the OE "X-ray" of the department "Radiology". Therefore the physician registers the patient for the OE "X-ray". The patient leaves the treatment room of the OE "Initial treatment" and moves to the waiting area of the OE "X-ray". When invoked, P enters the X-ray treatment room where the physician performs the X-ray related examinations. After completion P is sent back to the OE "Initial treatment" and waits in the waiting area until invocation into the treatment room of the OE "Initial treatment" again. There the physician performs the

outpatient treatment on the basis of the radiograph. Finally the medicated patient is released and departs from the clinic. In this simple instance of a clinical session the patient runs through three OE visits. The duration of one OE visit consists of waiting time and treatment time. The waiting time is the time a patient spends in the waiting area of the OE, the treatment time is the time the patient spends in the treatment room of the OE. The total duration of the clinical session is therefore the sum of durations of all OE visits. All activities in the process as shown in Figure 2 are recorded by the ERP system. Measuring points mapped in the ERP system are illustrated by black diamonds. As one can see the system does not store useful process performance data for all activities. For instance, it does not record the time when a patient is invoked. Of course one could implement changes in the ERP system in order to map all necessary process performance data. However, a constraint of this study was not to implement any changes in the well established ERP system.

Other Options to Gain Process Performance Data

The challenge of performance measurement is having usable performance data. There exist various techniques of collecting performance data.

a) Client flow analysis, is used in the study of Lynam, Smith & Dwyer (1994). It is a manual technique which allows recording the way patients move through the clinic. Each patient entering the clinic is given a sheet of paper which notes the patient's arrival time. As the patient moves on, every service provider records on the client register form the initials (for identification) and the time when service starts and ends. When leaving the clinic, the patient deposits the form.

b) Another technique was used in the study of Lawthers et al. (1999). They collected data in 19 outpatient clinics by using patient surveys. The information reported by patients was used to indicate outpatient

clinic quality. The on-site survey consisted of two parts: The first part included questions about access, demographics etc. and had to be filled out by the patient while waiting for the doctor. The second part with questions about the current visit had to be answered by the patient at the end of the visit. The form could be returned by dropping it into a box or by mail return. The collected data was used to create 26 indicators. At the level of each clinic the data was analyzed by using simple descriptive statistics. Also, an achievable benchmark of care was created for each indicator.

c) A third technique is data collection using sensor networks. This technique was used in the study of Isken et al. (2005). They used a specific infrared tracking system which does not conflict with other hospital equipment or devices and is therefore appropriate for use in medical environments. It consists of two components: tags and sensor nodes. A tag is attached to a person's clothes and transmits a unique identification code. The sensors are placed in rooms of interest and receive the transmission from tags within reach.

d) As described, we used the data which is already stored in the ERP system. While client flow analysis (a) and patient surveys (b) need special effort for data collection, the two technical approaches sensor networks (c) and ERP approach (d) automatically collect process performance data at almost negligible costs. In practice, only random sampling is possible for client flow analysis (a) and patient surveys (b) whereas continuous sampling is possible for the technical approaches. A special characteristic of the ERP approach (d) is that the number of OEs does not count: the operating costs of collecting performance data from a large number of OEs are practically as low as data collection from one OE. Therefore all OEs of the outpatient clinic can be inexpensively compared if using the ERP approach for data collection. "*The more inexpensive and convenient it is to calculate a metric, the better"* (Hammer, 2007a). Setup costs and complexity are lower for client flow analysis (a) and patient surveys (b) in comparison to the

technical approaches. Setting up a sensor network (c) is estimated to cost more than setting up the ERP approach (d) (assumed that the hospital already acquired an ERP system). For time performance indicators time-related data is needed which can be best collected using the client flow (a) or the sensor networks (c) technique. For performance indicators mapping the quality of the outpatient treatment process, quality-related data is needed which can be best collected using patient surveys (b). The quality of the collected data is estimated to be the best if sensor networks (c) are used. A comparison of the different variants of collecting process performance data is shown in Table 1.

Table 1: Comparison of different variants for collecting process performance data

	Client flow analysis	Patient surveys	Sensor networks	ERP system
Setup costs for 1 OE	+2	+2	-1	0
Setup costs for n OEs (n>>)	+1	+2	-2	0
Operating costs for measuring 1 OE a small period of time	+1	+1	+2	+2
Operating costs for measuring n OEs a small period of time (n>>)	0	0	+1	+2
Operating costs for measuring 1 OE continuously	-1	-1	+1	+2
Operating costs for measuring n OEs continuously (n>>)	-2	-2	0	+2
Complexity	+2	+2	-1	0
Time-related data availability	+2	-1	+2	+1
Quality-related data availability	-1	+2	-2	0
Quality of data	0	+1	+2	0
scale from -2 (very bad) to +2 (very good)				

Performance Indicators of the Outpatient Treatment Process

In order to gain information about the outpatient treatment process performance, it was necessary to define performance indicators. With the help of a few, but concise performance indicators, statements about process performance and possible optimization potentials can be derived. In our case, the performance indicators were defined by a team consisting of physicians, nurses, medical assistants and representatives of the hospital management. Within five sessions, first process objectives were derived from business objectives and second performance indicators were developed. Of course, not all defined performance indicators could be realized due to the fact that not all desired process performance data were mapped in the ERP system. Generally, there are three classes of performance indicators: cost, time and quality (also often referred to as the magic triangle). In our case, we focused on time and efficiency (as an indicator for process quality) and did not go into financial metrics. Due to the fact that outpatient care systems are rarely evaluated as an entire system (Matta & Patterson, 2007), performance indicators for the OE level, the department level and also for the entire outpatient clinic are provided. Table 2 shows the performance indicators which could be realized.

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Table 2: Realizable performance indicators

Level	Performance indicator	Data used in calculation of performance indicator
OE	Time spent in OE (=waiting time + treatment time)	Time of registration for OE, time of release from OE
Clinic	Time spent in outpatient clinic	Time of registration for first OE visit, time of release from last OE visit
OE/Dept./Clinic	Service documentation rate	#(OE visits with documented services)/#(total OE visits)
OE/Dept./Clinic	Medical documentation rate	#(OE visits with medical documents created)/#(total OE visits)

Table 2: Realizable performance indicators		
Level	Performance indicator	Data used in calculation of performance indicator
OE/Dept./Clinic	Time between registration for OE and service documentation	Time of registration for OE, time of service documentations
OE/Dept./Clinic	Time between registration for OE and medical documentation	Time of registration for OE, time of creation of medical documents
OE/Dept./Clinic	Conflicting appointment rate	#(scheduled appointments at same time)/#(total scheduled appointments)

IT Implementation

The ERP system supports the outpatient treatment process and automatically collects process performance data. This raw data from the ERP system are not ready for analysis and thus need to be preprocessed. The primary purpose of an ERP system is supporting a business process and not collecting performance data of the business process. This fact combined with the human factor (the ERP system is not identically used by all users) creates a number of unique challenges in interpreting and preprocessing raw data from the ERP system. Preprocessing raw data for analysis purposes is highly time-intensive and therefore should not be disregarded (Myatt, 2007). Because the objective of this study was to automatically measure process performance, data preprocessing also had to be automated. Therefore a software system prototype for preprocessing the raw data had to be implemented and this software automatically takes the raw data from the ERP system as input and outputs structured and clean data which is ready for reporting and visualization. There are a lot of possible diagram types visualizing the performance data of the outpatient treatment process. For example, one draws a radar diagram visualizing an OE's performance indicators for a specific time period (see Figure 3a). This type of diagram allows comparison of the actual and the desired state of the outpatient treatment process performance. It can

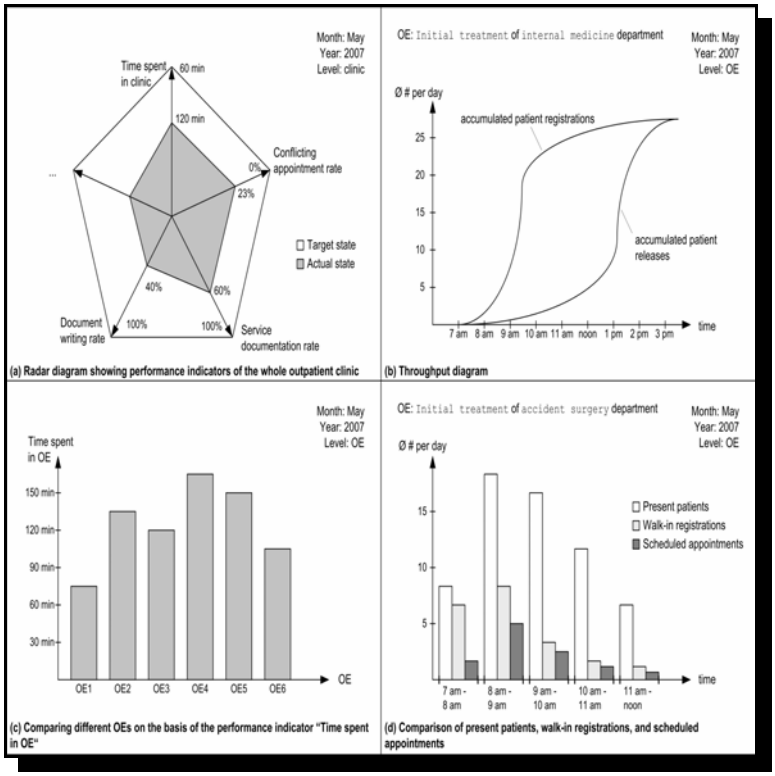
be applied for a user-defined level, the department level and to the clinic level as well. A throughput diagram is also a good choice for visualizing process performance (see Figure 3b). This type of diagram shows the average number of accumulated patient registrations and the average number of accumulated patient releases per day for an OE. The vertical difference of the two curves shows how much patients were present at the OE at a specified time. The horizontal difference of the two curves shows how long the average treatment time was (assuming the first in first out principle) when a patient had registered at the OE at the specified time. Peak times can be easily identified with this type of diagram. Another possibility is comparing different organizational entities on a performance indicator basis (see Figure 3c). Benchmarking can be performed using this diagram type. Finally, one could draw a diagram comparing present patients, walk-in registrations and scheduled appointments for an OE (see Figure 3d). The present patients variable shows how many patients were present in the OE at a specific time period. The walk-in registrations variable indicates how many patients without a scheduled appointment registered within a specific time period. The scheduled appointments variable shows how the appointments had been scheduled over time (all variables are on a per day basis). Using this diagram, scheduled appointments can be planned in a smarter way knowing when walk-in patients are most likely to appear.

CONCLUSIONS

We described an approach for performance measurement of the outpatient treatment process in an Austrian hospital. An ERP system which supports the outpatient treatment process is used for the collection of raw data. The outpatient treatment process of the hospital can now be controlled by using process performance indicators. In particular, peak times can be located and reduced which results in shorter patient waiting time; appointments and resources (personnel, facilities) can be better planned and benchmarking between OEs and departments can be performed. In general, the impact of any organizational change on process performance can be shown almost in real-time. In this study we also compared our approach with other data collection

techniques. Although automatically collecting performance data represents a great advantage (there are almost no operating costs), the ERP approach does not come without problems: The first drawback is of technical nature: ERP systems are primarily designed to support business processes; collecting detailed process performance data is not their main purpose. Hence, they do not record all desired data. We recommend implementing some changes in the ERP system in order to store desired process performance data which is currently not available. The second problem is of human nature, e.g. sometimes patients are released from the clinic but still left in the "under treatment" status in the ERP system for some time. Such inconsistencies cause bias in performance data which slightly diminishes data quality.

Figure 3: Sample charts visualizing process performance



The further course of action is as follows: The same ERP system we met in our study was recently rolled out in all of those 20 hospitals which belong to the holding company. So process performance measurement by using the ERP approach can be applied in those clinics as well and the outpatient process performance of all clinics can be benchmarked. Hospital managers can use the results of other hospitals to find out how good or bad their outpatient treatment process performs against the others.

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CHANGE FACTORS AFFECTING THE TRANSITION TO AN EMR SYSTEM IN A PRIVATE PHYSICIANS' PRACTICE: AN EXPLORATORY STUDY

Aaron D. Spratt, Social Security Administration
Kevin E. Dickson, Southeast Missouri State University

ABSTRACT

This study examines key variables associated with enacting a significant organizational change and hypothesizes how these variables affect employee acceptance, or buy-in, to the change initiative. More specifically, this study focuses on the office staff of a private medical practice transitioning from paper medical records to an electronic medical records (EMR) system. Data were collected from the non-physician office staff through three questionnaires administered during different points in the implementation process. The resulting data were analyzed to test the hypotheses and to learn more about the relationships between employee buy-in and the following variables: organizational communication, participation in the change process, procedural justice, self-interests, job security, tolerance for change, and understanding of the change implications.

A small sample limited statistical testing. The results, therefore, are interesting in pointing to patterns that should be tested in future research but do not provide statistical evidence. This study found limited support for all the above independent variables as predictors of buy-in at some point in the implementation process. However, some variables, such as understanding of the organizational-level change implications, did not become predictors until the final round of surveying. Others, like communication and both justice variables, were predictors throughout the study.

INTRODUCTION

In recent years, many healthcare organizations have undertaken the transition from a traditional paper system to an electronic medical records (EMR) system. Research in this field has shown that EMR systems can, over time, improve the quality of care provided, accuracy of patient information, and overall safety of patients through reduced medical mistakes. However, such a transition represents a significant change in business process for most organizations. Studies dealing with physician acceptance of such systems have been published, and this paper cites one particular study showing strong physician commitment to newly-implemented EMR systems.

While attention has been given to eliciting feedback from physicians, it appears that much less consideration has been given to the remainder of a healthcare organization's staff in regards to this significant transition. In reality, office staff like nurses, schedulers, receptionists, insurance specialists, medical records keepers, and billing specialists spend a significant amount of time interacting with EMR systems as well. Therefore, research into EMR transition and acceptance is incomplete without studying the opinions and attitudes of healthcare organizations' non-physician staff, and this study begins this effort by following the implementation of an EMR system in an outpatient surgical clinic.

The transition to an EMR system is a very specific change effort, but its success or failure is dependent upon a few key factors that are common to most change initiatives. Drawing key components from the available literature, this paper examines the components of change over which the management of the healthcare organization has influence: individual employee resistance, the effects of employee tolerance for change in general, and how all these components ultimately affect employee "buy-in" to the change.

THE IMPETUS FOR CHANGE IN HEALTHCARE

The U.S. health care industry has been argued to be among the world's largest, most inefficient information enterprises. Although health care costs

absorb roughly $2 trillion per year, many measures of health and wellness are lower in America than in several other developed countries (Hillestad et al., 2005). The vast majority of patient medical records in the United States are stored on paper, which means they cannot be easily shared to coordinate care, measure quality, or reduce medical errors. Other weaknesses of paper records include illegible handwriting, ambiguous or incomplete data, and data fragmentation (Roukema et al., 2006).

EMR systems represent a departure from traditional paper records keeping in that they include patient demographics, medical histories, and all records of patient treatment stored in a computerized format. When coupled with networked systems and the Internet, the EMR platform offers increased versatility in terms of transferability of information, greater communication among doctors, and improvements in quality of care, just to name a few advantages.

While the study focuses mainly on the advantages associated with EMR systems, this technology introduces more complexity into an already confusing healthcare system. The Health Insurance Portability and Accountability Act (HIPAA), passed as part of the Social Security Act of 1996, addresses patient confidentiality and privacy in the healthcare system. More specifically, one major component of this law sets standards, privacy requirements, security requirements, and national identifier requirements to ensure protection of patient health information in the electronic transmission of data (HIPAA, 1996).

Introducing an EMR system into an existing medical practice requires a careful review of HIPAA's regulations. Instead of having all patient records physically stored in one medical records room, patient information is stored in a format that can be accessed by multiple individuals, who in turn can transmit this information to off-site locations. Therefore, any organization adopting an EMR system should be prepared to invest enough resources to make sure the system is HIPAA compliant, lest the organization be in violation of the law.

Quality Improvements

In terms of quality, the advent of EMR promises reductions in medical mistakes, thereby improving patient safety. This technology will also assist physicians in better disease prevention and more efficient management of chronic diseases. The aforementioned improvements will also lead to an overall reduction in health care costs and just as important, more effective and efficient use of health care dollars, which could potentially drive down the cost of health care.

Under the current system of care in the United States, when a person shows up at a new clinic or hospital for treatment, it is most likely that the health care entity will have very little information about him or her and will have at best, only limited tools to track how other providers have treated this patient in the past. According to the Institute of Medicine, as many as 98,000 patients die in U.S. hospitals each year due to preventable medical errors, such as receiving the wrong medication (Kohn, Corrigan, & Donaldson, 2000). Additionally, nearly half of all patients do not undergo all the treatment or tests that they should have received (Swartz, 2004). This system failure can be connected to a lack of reliable health information. While the clinic researched for this study does not see emergency room patients or treat critically ill patients in their office, the issue of reducing medical mistakes and improving the overall quality of patient care is still relevant.

Schwarz (2004) cites a study conducted by the research firm Harris Interactive which uncovered several major causes for medical errors. The most common error this study found involved multiple physicians treating the same patient without having access to all the patient's records. Typical of these scenarios is treating physicians each referring to different, incomplete records stored in different locations. This type of error would be all but eliminated with the widespread use of EMR systems that would be accessible to all a patient's physicians. The particular surgical clinic studied for this paper obtains many of its new patients through primary care physician referrals. In this situation, the ability to share patient records through an EMR network would be ideal. However, as recently as 2005, only 15-20 percent of U.S. physicians' offices and just 20-25 percent of U.S. hospitals had adopted

EMR technology (Hillestad et al., 2005). Barriers to adoption include high implementation costs, lack of certification and standardization, and concerns about privacy, to name a few. Therefore, EMR systems are currently islands in a sea of paper records, and the full benefit of interconnectivity remains to be fully realized.

EMR systems offer other features that lead to increased patient safety in addition to offering more complete and concise documentation than paper records. Computerized physician order entry (CPOE) is the electronic process through which physicians input orders for treatment (i.e. prescription refills or orders for testing and lab work) through EMR systems. Built-in reminders and alerts, such as warnings about potential drug interactions, make errors more difficult for physicians to commit. Secondly, such EMR systems allow practitioners to track an order through the system once it has been entered in, following the steps through administration and completion. According to a study conducted by Richard Hillestad and colleagues (2005), CPOE could eliminate 200,000 adverse drug events and save about $1 billion per year if installed in all U.S. hospitals.

EMR systems are also useful in managing patients with chronic diseases. One study indicated that just fifteen chronic conditions accounted for more than half of the growth in healthcare spending between 1987 and 2000, and just five of these diseases accounted for 31% of this increase (Hillestad et al., 2005). EMR systems can greatly aid physicians in managing chronically ill patients by tracking the frequency of preventive services, reminding physicians to offer needed tests during patient visits, and by ensuring that critical, disease-specific results are consistently recorded on each visit.

Cost Savings

The quality improvements made possible through EMR systems will ultimately translate into cost savings. Fewer medical mistakes and improved patient safety will lead to cost savings. Better preventative care for all patients and improved maintenance of chronic conditions also translates into savings by way of fewer hospitalizations and the avoidance of more costly,

"reactive" treatment. A statistical model to predicting the potential savings and business efficiencies if 90% of U.S. health providers eventually adopted a nationwide EMR network yielded a conservative estimate of $81 billion in savings per year. Broken out further, the model indicated that $77 billion would be saved through improved efficiencies and $4 billion would be saved by way of reducing medication errors. However, the hospitals and physicians making the investment of purchasing this system would not immediately see the financial benefits (Swartz, 2005). A six-month study conducted by the Department of Health and Human Services found that information technology and the use of automated coding software within the context of electronic systems can enhance anti-fraud activities by aiding in fraud detection and providing evidence for prosecution (Swartz, 2006).

This particular study is not focused on the financial implications of adopting an EMR system but rather on those outcomes related to quality of care, patient safety, and accuracy. At the outset of implementation, the clinic adopting this new EMR system did not submit the issue of financial gain as one of their reasons for implementation. However, it is important to include some discussion on the financial implications of EMR implementation because this technology offers such promising prospects in this arena.

Having the capabilities of an EMR system as described in this paper could be limited by physician usage. A user satisfaction survey of over 400 family physicians currently utilizing an EMR system asked whether the physicians thought the system they used was a bad choice or a good choice, 76% of physicians indicated it was a good choice. When asked to rate their expertise as computer users on a seven point scale, 78% rated themselves as "above average" or higher. Perhaps most importantly, when asked to respond to the statement "If I could go back to paper-based records with no financial penalties, I would do so," an overwhelming 87% of respondents either disagreed or strongly disagreed (Edsall & Adler, 2005). While these are the results of only one study, it highlights that physicians are not only capable of switching to an electronic system, but that many also favor the capabilities of their new EMR systems over old paper systems.

The current study explores how the non-medical office staff of a physician's office react to the introduction of an EMR system and which key

components of change they feel are most significant in the implementation process since these staff have a significant effect on the success of the change and may face the largest burden of the change in an office setting. Securing the commitment, or buy-in, of the non-medical office staff to this change effort is important, as it is this group of individuals who keep the business activities of a physicians' practice flowing smoothly.

ORGANIZATIONAL CHANGE

According to Lines (2005), organizational change is defined as a deliberately planned change in an organization's formal structure, systems, processes, or product-market domain intended to improve the attainment of one or more organizational objectives. The drivers for organizational change can come from within an organization (internal factors), outside an organization (external factors), or can be a combination of both. Collectively, these drivers act as catalysts for change. Common drivers of organizational change in today's marketplace include globalization of business, the exponential growth of technology, a renewed focus on the value chain, the removal of boundaries and bureaucracy within organizations, creative leadership, and the challenge of providing customer value (Kerr & Ulrich, 1995). The main drivers behind the transition to an EMR system may be primarily expanded technology and providing customer value.

Lewin's (1951) force-field theory of change suggests that two sets of forces, resistance to change and forces for change, are always in opposition within an organization. As long as the forces resisting change are greater or equal to those supporting change, the organization remains inert and unchanging. Therefore, if an organization is to experience successful change, its managers must either reduce the forces representing resistance to change, increase the forces driving the change effort, or achieve both. Any combination of these scenarios will result in a shift in equilibrium to accommodate change. This area of study is important because effecting successful organizational change and other business process redesign has a propensity to be problematic, regardless of the organization type or industry. To assess the perceived efficacy of major organizational change, a study of

210 managers from a cross-section of industries in North America was conducted (Smith, 2003). In a questionnaire, managers were asked to recall a specific organizational change within the last two years and rate that effort's success on a scale of 1 to 10. Any project rated 8, 9, or 10 was considered a success. Even so, only 23% of the projects fell into this category (Smith, 2003).

Elmuti and Kathawala (2002) surveyed 126 business executives and managers in regards to their companies' organizational change efforts. In analyzing their results, the researchers found that the most common reasons for failure were inadequate understanding of the change effort, lack of effective methods to implement the change, and lack of executive leadership, support, and participation. Based on these findings and a review of similar research literature (Chawla & Kelloway, 2004; Trader-Leigh, 2002; Szamosi & Duxbury, 2002), this paper suggests that there are a few key indicators for successful change over which organizations have a meaningful level of control. As articulated by Szamosi and Duxbury (2002), these factors include effective communication, soliciting employee participation, and correctly applying justice or fairness in the change process.

Effective communication within an organization is critical to the success of a change initiative. Uncertainty about the future is bound to be present to some degree in an organization undergoing change, but this uncertainty is increased when primary sources of information regarding change are the rumor mill or the media rather than consistent messages from the changing organization's management (Rentsch & Schnieder, 1991). Wanberg and Banas (2000) similarly concluded that increased information about proposed changes within an organization directly resulted in greater acceptance of the ultimate changes.

According to Chawla and Kelloway (2004), successful change is characterized by high-quality communication throughout the change process in order to facilitate openness and commitment to the change effort. Their study of five hundred and forty-one employees who recently experienced an organizational merger, suggested that a direct link between communication and openness to change is a necessary component. Chawla and Kelloway's

(2004) results support the hypothesis that effective communication is a significant predictor of openness and commitment to change.

Similarly, Szamosi and Duxbury (2002) argued that communicating the need for change, providing frequent communication, and sharing a common organizational goal that is often reiterated are organizational behaviors viewed by employees as being supportive of change. The preceding arguments regarding communication are relevant to this study's examination of an EMR implementation initiative. The management of this organization desires to decrease employee uncertainty about the change effort by providing frequent communication throughout the implementation process. By increasing the level of information employees receive about the proposed changes, management desires to ultimately increase employee commitment, or buy-in, to the change. This leads to this study's first hypothesis:

H1: Higher levels of communication regarding the change will be positively related to employee buy-in to the change initiative (EMR implementation)

A second indicator over which organizations have control is the level of employee participation. Wanberg and Banas (2000) suggest that the enlistment of employee participation and input in the change process increases performance and commitment and reduces resistance to change. In the study published by Chawla and Kelloway (2004) detailed above, employee participation, like communication, was also argued to significantly influence overall openness and buy-in to change.

Smazosi and Duxbury (2002) conversely argued that when employees are not asked by management if there are better ways to do things (a lack of participation), members of the organization are very likely to feel that the resulting climate is not supportive of employee input into the change. The preceding research supports the argument that employee participation is a central component in the buy-in process for a change initiative. The second hypothesis is:

H2: Management-solicited employee participation will be positively related to employee buy-in to the change initiative.

The issue of fair treatment, or justice, invariably arises during periods of organizational change (Greenberg & Tyler, 1987). Chawla and Kelloway (2004) suggest that fair treatment can facilitate trust and ultimately commitment to a change initiative, which are critical for a change's success. On the other hand, treatment that is perceived as being unfair by employees has been found to result in resistance to change (Kilbourne, O'Leary-Kelly, & Williams, 1996).

The preceding section cited research to support the argument that employee participation in the change process encourages commitment to the change effort. Korsgaard, Schweiger, and Sapienza (1995) studied twenty mid-level management teams from Fortune 500 companies and analyzed how the decision-making procedures used to arrive at strategic change initiatives impacted team members' commitment to these decisions. Their findings on the importance of procedural justice led them to argue that while employee participation in a change effort is essential, the participation process must be perceived as being just and must create the perception that management is genuinely concerned about employees' participation in the change process. In addition, Chawla and Kelloway's (2004) research has shown that perceptions of justice augment employee levels of commitment and buy-in.

Moorman (1991) argued that organizational justice, defined as the role of fairness as it relates to the workplace, and organizational citizenship behaviors (OCBs), defined as organizational behaviors that promote the effective functioning of the organization. The definition of OCB is somewhat similar to the concept of employee buy-in to a change initiative. The desired end result of any major organizational change is the overall improvement (more effective functioning) of the organization. Buy-in or commitment to a change effort compels employees to actively participate in and work effectively under the conditions of change. Since OCBs are defined as behaviors that promote the effective functioning of the team, it should reasonably follow that employees who display OCBs have already passed

through the buy-in stage of the change effort. However, it is possible that an employee displaying OCBs may decide against buy-in to a change effort if the change is perceived as damaging to the overall improvement of the organization.

While the study does not minimize the importance of distributive justice, which measures the degree to which rewards received by employees are perceived to be related to performance inputs (Price & Meuller, 1986), the study focuses more on procedural justice, which describes the fairness of the procedures used to determine outcomes (Folger & Greenberg, 1985). According to Bies and Moag (1986), procedural justice consists of two components, formal procedures and interactional justice. While formal procedures measures the degree to which fair procedures are used in the organization, interactional justice pertains to the way in which these procedures are actually carried out by managers. In citing the work of Bies and Moag (1986), Moorman (1991) noted that actions taken by managers as they enact procedures and explain decisions are instrumental in determining if procedural justice exists. Therefore, a detailed measure of procedural justice includes items measuring fairness perceptions of formal procedures and fairness perceptions of interactions with management.

The change to an EMR system will require frequent interaction between management and employees. This direct interaction will be used by employees as the basis for their perceptions about interactional justice. Therefore, management should pay careful attention not only to crafting fair procedures and policies, but also to the fairness with which direct employee interactions are conducted. The discussion leads to the third and fourth hypotheses in which the components of procedural justice are tested:

H3: Fair use of formal procedures will be positively related to employee buy-in to the change initiative.

H4: High levels of interactional justice will be positively related to employee buy-in to the change initiative.

EMPLOYEE RESISTANCE TO CHANGE

According to Lewin's (1951) model, there always exists in an organization some level of resistance to change. Even when the factors named in the previous section are fully leveraged by an organization undergoing change, there still remains a residual level of resistance. Some of this resistance can be attributed to individual perceptions and the internal resistance to change that lies within each employee. Whereas the previous section dealt with factors related to the organization as a whole, this section examines those factors unique to each individual employee. These factors include self-interests, feelings of job security, individual tolerance for change, and individual understanding of the change implications. To reduce resistance to change in an organization, it is important to understand the role that each of these components plays in the change process.

OCBs assume that employees act in a manner that promotes the effective functioning of the organization. Under circumstances that elicit the highest levels of commitment, this holds true (Moorman, 1991). However, research suggests that ultimately, individual buy-in to any change initiative is significantly affected to the degree that employees can see their individual interests being met (Morgan, 1997). In general, people support change that benefits them, and depending on how the change will preserve, erode, or promote their position affects the way in which they will act (Morgan, 1997).

Trader-Leigh (2002) argued that self interest/buy-in is comprised of several variables, one of the most prominent being "beneficial," meaning to what degree employees perceive the change as being beneficial to them. Other variables include "rewards," (what direct rewards can be reaped through the change) "goal agreement," (to what degree the change corresponds to current work goals) and "capacity for additional work" (employees' perceptions about any additional demands imposed by the change). In other words, employees wanted to see at least some of their self interests being met by the change in order to buy-in to the change initiative. This self-interest factor is central to the fifth hypothesis:

H5: The degree to which employees' self-interests are met will be positively related to their buy-in to the change initiative.

Job insecurity is an almost reflexive fear that arises when the topic of organizational change is brought up. In fact, Greenhalgh and Rosenblatt's research (1984) found that the greatest threat to employees' sense of control over their jobs is large-scale organizational change. Taking this one step further, Rosenblatt and Ruvio (1996) found that job security remained a relevant concern of employees undergoing change even when there was no objective threat posed by the change. Chawla and Kelloway's (2004) study on openness and commitment to change found that job security was one of the direct positive predictors of overall openness and ultimate commitment to a change initiative. Similarly, Trader-Leigh (2002) discovered that job security was a significant variable in what she calls the psychological impact of change. This research on the significance of job security results in the sixth hypothesis:

H6: Higher levels of employees' perceived job security will be positively related to their level of buy-in to the change initiative.

O'Toole (1995) pointed out that "despotism of custom inhibits change." People desire to maintain an established order and in general, become agitated when this order is upset. While there are certainly actions that an organization can take to make change more palatable, there lies within each individual a certain level of resistance to change, which exists independently of any proposed organizational change. This feeling may arise due to memories of past failed change attempts, which typically lead to higher turnover rates, lower efficiency, decreased output, and an overall decreased organizational commitment (Goldstein, 1989).

However, not understanding the implications of a change effort can also explain individual resistance to a proposed change. Trader-Leigh (2002) identified a few key components related to employee resistance to change.

The most significant components of this factor include the variables "low tolerance for change" and "limited understanding of the change implications" (Trader-Leigh, 2002). This latter variable deals with employees' hesitancy to commit to a change due having a lack of knowledge concerning the outcome or implications of the change effort. These implications can be as specific as whether or not individual employees understand how their daily job responsibilities will be affected in the new environment. These implications can also be as broad as whether or not employees understand the overarching organizational goals the change is aimed at achieving or the processes and functional areas the change is aimed at improving. This topic is similar to the importance of communication throughout the change process. However, while communication involves repetitively highlighting the reasons for the change effort and frequently conveying critical information pertaining to the change, this communication does not necessarily convey to employees the end result of how their specific jobs will be affected or other short and long-term implications the change will have upon the workplace. Trader-Leigh's (2002) research concluded that the implementation plan for any change effort should include strategies to address individual resistance variables. Hypotheses seven and eight arise due to these human characteristics:

H7: Employees' understanding of the change implications will be positively related to their buy-in to the change initiative.

H8: Employees with higher tolerance for change will also exhibit higher levels of buy-in to the change initiative.

For this particular study, the *intended* positive implications of the EMR implementation for the organization include improved accuracy of patient records keeping, improved patient safety through more complete and better-coordinated records keeping, and overall improved quality of patient care. Therefore, three additional hypotheses specific to the organizational-level change implications of this particular change effort are:

H9: Employees' positive perceptions about the ability of the EMR system to improve patient safety will be positively related to their buy-in to the change initiative.

H10: Employees' positive perceptions about the ability of the EMR system to improve the accuracy of records keeping will be positively related to their buy-in to the change initiative.

H11: Employees' positive perceptions about the ability of the EMR system to improve the overall quality of patient care provided will be positively related to their buy-in to the change initiative.

RESEARCH SETTING

A privately-owned surgical clinic in a small Midwestern city was chosen as the research subject for this study. This clinic employs 36 people, seven of whom are physicians. The remaining staff consists of other clinical personnel (nurses and a nurse practitioner), a practice administrator, and administrative/clerical staff that handles scheduling, billing, transcribing, insurance coding, medical records, and secretarial duties. This study includes background information on this facility, qualitative data regarding the implementation process, and periodic updates during the implementation via interviews with the administrator of this practice.

According to the practice administrator, the decision to upgrade to an EMR system was incorporated into the second phase of a long-term plan. The first phase involved moving into a larger, more modern building. The rationale for switching to an EMR system to replace the paper records system was two-fold. The executive committee felt that the overall quality of patient care, accuracy of records, and safety of patients would be improved through an EMR system. Secondly, they realized that an EMR system would become

a necessity as more insurance plans and Medicare move towards pay-for-performance reimbursement, which translates into more strict reporting requirements.

Under the traditional paper medical records system at the clinic, doctors are required to dictate their handwritten exam notes onto tape. Two in-house transcriptionists then listen to these tapes and type up the exam notes on computer. A paper copy of the exam note goes into the patient's chart, which is stored along with others on vertical filing shelves in the clinic's large medical records room. A back-up copy is also saved on the computer. The back-up copy on the computer cannot interface with the current computer appointment scheduling applications.

The clinic's selected EMR system is designed to provide an interface between the patient's chart and other applications, namely appointment scheduling and patient demographics. Existing charts will be scanned into the new system and will become part of the patient's new electronic file. Everything from physician referrals, prescription orders, prescription refills, and phone conversation notes will be tracked through the new system, and these activities are automatically tied to each patient's electronic file. The desired outcome is to reduce medical and clerical errors, provide a more complete and accessible picture of each patient's clinical history, and increase connectivity of office computer systems.

Multiple computer software and hardware upgrades were undertaken in order to accommodate the EMR system. In addition, four new servers were purchased to support the various tasks of the EMR system. In the month prior to EMR implementation, the clinic's network engineer was contacted. He confirmed that all four servers were online, and all the new workstations were operational. Furthermore, he reported that all the computer hardware and software needed to support the EMR system was in place, and he foresaw no problems with meeting the implementation deadline. This contact was made to ensure that any problems or resistance encountered during the implementation process could not be attributable to computer hardware or software issues.

HISTORY OF THE CHANGE

The surgical clinic initiated implementation of their EMR system in October. In the month prior to implementation, all office staff was trained on the various aspects of the system. Each employee was provided with work flow charts for a basic patient visit from start to finish. In addition, they were given specific flow charts for their respective positions, which broke out in more detail the specific instructions for their given jobs. Each employee also received formal training on the EMR software. The office utilized specified "trainers" who conducted training sessions in the clinic's conference room, which was set up like a computer lab with multiple laptop workstations. It was a quiet environment in which 2-3 people at a time received training. This small group size resulted in more individualized instruction, and it was necessary to train in small groups in order to keep the daily business activities of the clinic up and running at all times. Each employee received a half-day of formal training as well as an explanation of the flow charts. In addition, front desk personnel received extra "spot training," since they were involved with the front end of every patient encounter, whether it is in person or on the phone. Employees were encouraged to review the flow charts for their assigned job responsibilities.

The clinic phased-in the EMR system. At the outset, the administrator estimated that it would take about one month before the new system accounted for half of their patient work flow and two months before 100% phase-in. Admittedly, this was an optimistic or "best case" prediction. The phase-in approach called for each physician to follow a schedule in which he or she would see an increasing number of patients each week under the new EMR system. Their incentive for doing so would be the elimination of dictation, a task that is universally disliked.

METHODOLOGY

Questionnaire and Data Collection Process

To gather primary data related to the change process, the non-physician staff of the clinic participated by completing questionnaires, which were distributed by the administrator's assistant. Employees were informed that their participation in the study was voluntary and that their responses would remain confidential. No identifying information was included on the questionnaire except for some basic demographic data supplied by the respondents. A large manila envelope was placed in a discrete area where employees could submit their completed questionnaires as they felt appropriate. For all three rounds of data collection, the employees were given at least 7 days to complete and submit their questionnaires.

The self-administered questionnaires were distributed to the non-physician office staff during different points in the implementation process. The first questionnaire was distributed and collected in the week prior to the EMR implementation date. The second and third questionnaires were distributed and collected at approximately two months into the implementation and at four months into the implementation process respectively.

Respondents were asked to provide basic demographic information such as gender, age, and job classification. The main body of the questionnaire consisted of statements to which the respondents were asked to indicate their level of agreement using a seven-point Likert scale. The scale ranged from "strongly disagree" to "strongly agree", with an option for "neutral" and "not applicable." Of the 28 people to receive questionnaires (the office administrator was asked not to participate), 22 questionnaires were completed in the first round (79% response rate), 16 were completed in the second round (57% response rate). For round three, 18 completed questionnaires were collected (64 % response rate).

The final portion of the questionnaire was a section containing open-ended questions. For the first two rounds, respondents were asked two open-ended questions relating to the change process. In the third round of

questionnaires, eight open-ended questions were added. This section was included to elicit additional qualitative information related to the change from employees and to uncover any underlying areas of concern.

The questionnaire instrument itself evolved slightly over the course of the data collection process. After analyzing the results of the first round, some items were viewed as near-duplicates of others and were omitted for the sake of brevity. Other items were omitted when the preliminary analysis indicated that they did not apply to this particular setting. Lastly, a couple items were reworded slightly to make their intent more clear.

This process was used as a grounded theory approach to the research given the exploratory nature of the study and the limited sample size. Glaser and Strauss (1967) conceived this theory, which is an approach for looking systematically at data with the aim of generating a theory or hypothesis. Under this practice, data sampling and analysis are seen as steps that can be repeated until one can describe and explain the phenomenon being researched. According to Glaser and Strauss (1967), grounded theory emphasizes induction, and it can be helpful in elaborating on existing theory. This study used some principles of grounded theory and also served to test and develop a stronger instrument for measuring this change in future research.

Dependent Variable

Buy-In: Buy-in to a given change initiative is the end result of the process discussed up to this point. It is that juncture at which employees decide whether or not to commit to the change. Buy-in was assessed using the Organizational Change Survey developed by Neubert (2006). Respondents were asked to rate their level of agreement using a seven-point Likert scale with "1" representing "Strongly Disagree" and "7" representing "Strongly Agree." Six items comprise this scale. The reliability of this scale was 0.87 for the first questionnaire, 0.92 for the second questionnaire, and 0.85 for the third questionnaire.

Independent Variables

Communication: Items from Neubert's (2006) survey and factor analysis from Szamosi and Duxbury's research (2002) were used to develop this scale, which measures the consistency of management in communicating the need for the change initiative. For the first questionnaire, six items were included. For the second and third questionnaires, this scale was reduced to four items, as preliminary analysis indicated that a couple of the items were redundant. The reliability of this scale was 0.86 for the first questionnaire, 0.95 for the second questionnaire, and 0.80 for the third questionnaire.

Employee Participation: This scale was also developed by borrowing from Neubert's (2006) and Szamosi and Duxbury's (2002) research, and it measures respondents' opinion on how much participation and input they feel they've had in the change process. One item was deleted following the first questionnaire because that item did not pertain to this particular change effort. The reliability of this scale was 0.90 for the first questionnaire, 0.80 for the second questionnaire, and 0.82 for the last questionnaire.

Self Interest: Four items comprise this scale, which was developed using Trader-Leigh's (2002) research findings and Neubert's (2006) Organizational Change Survey. This scale looks at whether respondents feel that the change initiative has been personally beneficial. The reliability of this scale was 0.86 for the first questionnaire, only 0.54 for the second questionnaire, and 0.83 for the last questionnaire. The second questionnaire was completed by the least number of respondents, which means that the reliability of the scales on this questionnaire was the most vulnerable to being significantly affected by respondents who did not understand items or answered carelessly.

Job Security: The job security scale consists of four items and was developed using Moorman's (1991) factor analysis of research data and Nuebert's (2006) Organizational Change Survey. It examines respondents' feelings on job security in light of the change implementation. This scale was found to be reliable in all three rounds of questionnaires (α=0.86, 0.90, and 0.79).

Tolerance for Change: This scale was developed using Trader-Leigh's (2002) research on which factors are underlying causes of resistance to change and Neubert's (2006) Organizational Change Survey, which contains items consistent with the theory and findings of Trader-Leigh's (2002) research. In the first questionnaire, this scale's reliability was 0.79. Reliability on the second questionnaire was 0.74. Reliability on the final questionnaire was found to be 0.72.

Understanding of Change Implications (Job-Specific): Trader-Leigh's (2002) factor analysis of research data and Neubert's (2006) survey were used to develop this scale for measuring employee understanding of their job-specific change implications. The scale was found to be reliable (α=0.90). The second and third questionnaires included five items, as two of the items did not appear to relate well to the setting of this particular change effort after preliminary analysis. Reliability for this scale in questionnaires two and three was 0.84 and 0.82, respectively.

Understanding of Change Implications (EMR/Organization-Specific): To assess respondents' understanding of the organizational-level EMR change implications, the questionnaire contained items in three sub-scales: Understanding of Patient Safety Effects, Understanding of Quality Effects, and Understanding of Accuracy Effects. Each of these scales was comprised of three items. The "Safety" scale was not strongly reliable on the first questionnaire (α=0.60). However, the reliability of this scale improved significantly in rounds two and three of data collection (α=0.92 and 0.89). The wording of the reverse-coded item in this scale was changed slightly for clarity after the first round of data collection, which likely accounts for this change in reliability. The "Quality" scale was fairly reliable in all three rounds of questionnaires (α=0.80, 0.75, and 0.83). The "Accuracy" scale was reasonably reliable in rounds one and three (α =0.76 in round one and 0.86 in round three). This scale was less strongly reliable in round two of questionnaires (α=0.54). As discussed previously, round two of data collection yielded the fewest number of respondents.

Justice: Using Moorman's (1991) research, respondents' opinion of procedural justice was measured using two scales, formal procedures and interactional justice. Each scale consists of three items that pertain to how

well management has employed justice in formal office procedures and how well management has treated each employee in a just manner in direct interactions. Both of these scales were found to be reliable throughout the three questionnaires. The reliability of these scales were: formal procedures scale— α=0.91, 0.90, and 0.77; interactional justice scale— α=0.90, 0.88, and 0.87.

Control Variables

Bureaucracy: Research conducted by Smazosi and Duxbury (2002) suggests that behaviors like allowing departments to shield themselves from change, allowing for conflicting departmental missions, and not eliminating bureaucracy are perceived as being non-supportive of change. However, this issue was outside the scope of this study and was only collected as a control variable. The mean for this control variable was 3.69 (on a seven point scale) in round one, 3.56 in round two, and increased slightly to 4.25 in round three of data collection. By round three, the new EMR system had been in place for four months. It is possible that by this time respondents felt some increase in the level of bureaucracy related to this change. However, the quantitative and qualitative data in this study are insufficient to reach any conclusions in this area, and this is a topic for possible future research.

Loss of Expertise: In addition to job security, Trader-Leigh's (2002) research highlighted another psychological factor impacting employees in the midst of organizational change which she termed "loss of expertise." Employees' perceptions that they may not be able to perform new job duties or that their previous level of expertise might be eroded by the change could result in resistance to buy-in. The mean for this control variable was 3.49 (on a seven point scale) in round one, 3.63 in round two, and 2.81 in round three. It appears that by the four-month mark, loss of job expertise was reduced below the pre-transition level.

Computer Support: Although the clinic's network engineer felt that everything was in place to proceed with implementation, the true test of the system's effectiveness would not be fully realized until it was operational under normal business circumstances. This particular clinic underwent major

upgrades in hardware, software, and networking applications. This variable was included as a control because problems with the new software/hardware or networking applications could result in increased employee frustration during the change initiative. The reliability was 0.70 for questionnaire one (with three items). Questionnaires two and three included just two items for computer support. The reliability of the scale for these rounds was 0.78 and 0.63. The mean for this scale in round one was 4.54 (on a seven point scale), 4.22 in round two, and 4.92 in round three. A mean above 4.0 (neutral) for all three rounds indicates that in general, respondents agreed that computer support was more adequate than inadequate.

Training: Inadequately trained employees likely encounter greater difficulty navigating the EMR system. This could adversely affect their level of commitment to the new system, thus this variable was included for control purposes. Three items were used for this scale in the first questionnaire, and this scale's reliability was 0.72. For questionnaires two and three, the scale was consolidated into two items. The reliability of the scale for these questionnaires was 0.91 and 0.91. The mean for this scale in round one was 3.61 (on a seven point scale), 4.06 in round two, and 4.69 in round three. The fact that the mean for round one was not above 4.0 (neutral) indicates that there were a number of respondents who felt that the training provided was not entirely adequate at that point in the implementation process.

Trust Because employee buy-in to the EMR change could be negatively impacted by low levels of trust for management and other co-workers, it was included as a control variable. This study used the scale developed by Mayer and Davis (1999). In the first questionnaire, this scale consisted of four items, and the scale had a reliability of just 0.59. On closer examination of the results, one of these items did not seem to fit well with this clinic's particular situation. Therefore, on questionnaires two and three, the scale was reduced to three items. The reliability for these rounds improved to 0.77 and 0.91 respectively. The mean of this scale in round one was 4.05 (on a seven point scale), 4.13 in round two, and 4.31 in round three. In regression analyses, trust was the only control variable that did not even approach significance.

Past Experience: During times of change, people may recall past experiences, including painful failures (Goldstein, 1989). However, others may have pleasant memories of past change attempts that worked out quite well. Because people have a tendency to reference past experiences when evaluating current change situations, this was included as a control variable. In all likelihood, only those people with extreme past experiences (either extremely good or extremely bad) would allow their past experience to significantly affect their commitment decision (buy-in) to the current change initiative. In all three rounds of questionnaires, this scale was found to be unreliable. Therefore, no analysis of this variable was conducted.

RESULTS

Post-Implementation Interview

At the time the final round of questionnaires were distributed—roughly four months into implementation—an interview was held with the office administrator to review the EMR process. She reported that the office had achieved one hundred percent paperless status in terms of patient charts. The office saw every patient under the new EMR system. All new patients were entered into the system upon their first appointment, and any returning patients had their old paper charts scanned into the EMR system. She reported that physicians adopted the EMR system at a faster rate than her minimum required rate. This was due to several factors. First, the practice's physicians were forward-thinking and embraced the idea of upgrading to such a system. Second, the doctors were highly competitive with one another. Last, the physicians were motivated to adopt the EMR system so that they could cease dictating.

The administrator indicated that the new system was performing about 95 percent of the functions they needed it to perform. At this time, the module used to assess patient charges was not working due to interface problems between their practice management system and the EMR software. This is one area in which the EMR software should provide time and labor savings, once the interface problems are fixed. Until this is fixed, office staff must

generate a ticket to indicate the level of visit for each patient, which determines the charges. The charges are then posted on the computer manually, as they have always been done. Other than this minor issue, the EMR software was working according to design.

While the EMR system was functioning without any major technical problems, the administrator noted that they have had to make significant modifications to tailor the software for their practice. She explained that all EMR software is set up with the needs of family practice, internal medicine, and general practitioners in mind. That is, the forms and templates in the software are designed for practitioners who see patients for initial visits to establish care and then routine follow-up visits. Customizing the software to meet the unique needs of surgeons has taken some effort. For example, the EMR software did not have a form to handle a post-operative patient visit. Also, the "Review of Systems" section of a patient visit form was more internal medicine-oriented rather than set up for the unique needs of surgeons.

At the outset of implementation, this caused some problems. The nursing staff was inputting the front-end patient information for each appointment, but the physicians were unhappy with how the information was entered. The physicians complained that the basic set-up of the forms was not user-friendly for surgical patients and was not "surgery-ready." Because many of the surgeons treat cancer patients, the physicians noted that the basic EMR forms were also insufficient for tracking the treatment of cancer patients. In the beginning, this problem resulted in the doctors altering the forms for each patient. To remedy this situation, the executive committee decided to send the most computer savvy physician to a class to learn how to use visual forms editor. This doctor learned how to create and customize forms, which are now in use.

All in all, the EMR system was working as designed, with the minor adjustments described above. The administrator commented that they could already see the benefit of having such a system. A traditional paper chart could be a nightmare because of opportunities for mistakes with the hand-offs that occur in the office. With the EMR system, the chart was available at any time to be accessed, and every action taken was documented in a log that shows who performed the task and on what date. The human element was not

removed from the system, but the EMR software reduced the opportunity for mistakes. Transcription time was eliminated. Under their paper system, it took the transcriptionist 24 hours to type up the dictation to get a copy into the patient's chart. With the EMR software, there was no transcription since the clinical and administrative staff entered all information when patient was seen.

With the adoption of the EMR system, it became clear that some job roles would be changing. The administrator gave a few examples. The clerical staff now had to index incoming lab work, pathology, and other outside tests that were electronically faxed into the EMR system. Every piece of outside information faxed in had to be indexed to the appropriate patient's chart. Prescription orders to pharmacies now left the office by electronic fax (no paper involved), and were sent by the nursing staff. The transcriptionist now performs other office tasks, such as typing the address information on outgoing correspondence.

The administrator said that there was never any major resistance against adopting the EMR system because the staff was not given any option but to implement. While this decision was never in question, the administrator did solicit a lot of input from staff members on how office business processes should adapt and who should be responsible for new job functions. She said there was a lot of discussion in the beginning among staff in regards to whose job it should be to do various tasks. She tried to listen to all the parties involved before making these decisions. She readily admits that as they moved forward with implementation, some job responsibilities were shifted around more than once.

Data Analysis

Only 22 usable questionnaires were completed in the first round; 16 were gathered in the second round; and 18 were submitted in the third round. With such a small sample size, no strongly supported conclusions can be drawn about the study's hypotheses. However data analysis was conducted to discover trends and patterns. A summary of whether each hypothesis was supported by each questionnaire is included in Table 1. Correlation matrices for each survey are also available in Tables 2, 3, and 4.

Table 1: Hypotheses				
H1	Higher levels of communication will be positively related to employee buy-in to the change initiative (EMR implementation)	S	S	S
H2	Management-solicited employee participation will be positively related to employee buy-in to the change initiative.	NS	S	S
H3	Effective management use of formal procedures will be positively related to employee buy-in to the change initiative.	S	S	S
H4	Effective management use of interactional justice will be positively related to employee buy-in to the change initiative.	S	S	S
H5	The degree to which employees' self-interests are met will be positively related to their buy-in to the change initiative.	S	S	S
H6	Higher levels of employees' perceived job security will be positively related to their level of buy-in to the change initiative.	S	S	S
H7	Employees' understanding of the change implications will be positively related to their buy-in to the change initiative.	NS	S	S
H8	Employees with higher tolerance for change will also exhibit higher levels of buy-in to the change initiative.	S	S	S
H9	Employees' positive perceptions about the ability of the EMR system to improve patient safety will be positively related to their buy-in to the change initiative.	NS	S	S
H10	Employees' positive perceptions about the ability of the EMR system to improve accuracy of records keeping will be positively related to their buy-in to the change initiative.	NS	NS	S
H11	Employees' positive perceptions about the ability of the EMR system to improve the overall quality of patient care provided will be positively related to their buy-in to the change initiative.	NS	S	S
Q= Questionnaire S = Hypothesis Supported NS = Hypothesis Not Supported				

Table 2: Correlation Matrix for Questionnaire 1

	Variable	N	Mean	S.D.	1	2	3	4	5	6	7
1	Communication	21	4.07	1.47	(.86)						
2	Participation	21	3.52	1.59	.77**	(.90)					
3	Self Interest	21	4.51	0.8	0.35	.57**	(.86)				
4	Buy-In	22	5.37	1.09	.60**	0.41	.56**	(.87)			
5	Job Security	21	5.07	1.27	0.4	0.37	0.32	.62**	(.86)		
6	Tolerance for Change	22	4.43	1.05	.64**	.53*	.52*	.62**	0.43	(.79)	
7	Change Implications (Job-Specific)	22	4.3	1.22	.56**	.47*	0.42	0.41	.65**	0.37	(.90)
8	Formal Procedures	20	4.25	1.67	.82**	.88**	.59**	.61**	0.44	.78**	0.36
9	Interactional Justice	22	5.08	1.3	.58**	.71**	.67**	.73**	.64**	.52*	.61**
10	Change Implications (Safety)	20	4.63	1.18	0.42	.48*	0.36	0.4	.45*	.60**	.49*
11	Change Implications (Quality)	21	4.6	1.28	.54**	.58**	0.43	0.42	0.31	.57**	0.32
12	Change Implications (Accuracy)	21	4.61	1.13	0.44	.51*	0.29	0.4	0.36	.46*	0.35
13	Computer Support	18	4.54	1.35	.71**	.58*	0.41	.67**	0.36	0.43	0.28
14	Training	18	3.61	1.61	.82**	.78**	.53*	.61**	.58*	.52*	.67**
15	Loss of Expertise	22	3.49	1.25	-.56**	-0.32	-0.16	-0.37	-.46*	-.66**	-.44*
16	Bureaucracy	13	3.69	1.6	0.51	0.4	0.19	0.22	0.39	.62*	.56*
17	Trust	22	4.05	1.26	0.26	0.03	-0.41	-0.09	0.12	-0.12	0.29

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)

Table 2: Correlation Matrix for Questionnaire 1 Continued

	Variable	8	9	10	11	12	13	14	15	16	17
1	Communication										
2	Participation										
3	Self Interest										
4	Buy-In										
5	Job Security										
6	Tolerance for Change										
7	Change Implications (Job-Specific)										
8	Formal Procedures	(.91)									
9	Interactional Justice	.66**	(.90)								
10	Change Implications (Safety)	.50*	.55*	(.60)							
11	Change Implications (Quality)	.75**	0.42	.55*	(.80)						
12	Change Implications (Accuracy)	.61**	0.34	.53*	.88**	(.76)					
13	Computer Support	.77**	.69**	0.27	0.46	0.32	(.70)				
14	Training	.74**	.76**	.51*	.52*	0.46	.71**	(.72)			
15	Loss of Expertise	-.59**	-0.35	-0.29	-.50*	-.50*	-0.4	-.50*			
16	Bureaucracy	.68*	0.43	0.53	0.27	0.2	0.4	.59*	-.69**		
17	Trust	0.07	-0.09	-0.05	-0.08	0.04	0.12	0.11	-0.38	0.08	(.59)

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)
Cronbach's Alpha is on the diagonal when available.

Table 3: Correlation Matrix for Questionnaire 2

	Variable	N	Mean	S.D.	1	2	3	4	5	6	7
1	Communication	16	4.2	1.62	(.95)						
2	Participation	16	4.23	1.31	.82**	(.80)					
3	Self Interest	16	4.89	0.87	.69**	.76**	(.54)				
4	Buy-In	16	5.14	1.1	.77**	.52*	.72**	(.92)			
5	Job Security	16	4.44	1.66	.72**	0.46	.51*	.68**	(.90)		
6	Tolerance for Change	16	4.4	1	.85**	.71**	.78**	.87**	.67**	(.74)	
7	Change Implications (Job-Specific)	16	4.65	1.27	.67**	.54*	.59*	.60*	.80**	.62*	(.84)
8	Formal Procedures	16	4.67	1.22	.87**	.89**	.74**	.59*	.60*	.71**	.64**
9	Interactional Justice	16	4.85	1.34	.92**	.80**	.68**	.64**	.67**	.71**	.61*
10	Change Implications (Safety)	15	4.29	1.18	.67**	0.5	.53*	.61*	.62*	.70**	.67**
11	Change Implications (Quality)	15	4.2	1.36	.90**	.96**	.74**	.79**	.55*	.86**	.58*
12	Change Implications (Accuracy)	16	3.83	1.05	.79**	.72*	0.45	0.32	.64**	.50*	.66**
13	Computer Support	16	4.22	1.49	.76**	.54*	.54*	.78**	.55*	.73*	0.46
14	Training	16	4.06	1.76	.91**	.81**	.70**	.60*	.73**	.73**	.73**
15	Loss of Expertise	16	3.63	1.82	-0.35	-0.4	-0.32	-0.12	-0.38	-0.35	-0.1
16	Bureaucracy	16	3.56	1.5	.79**	.51*	0.33	.53*	.58*	.56*	0.49
17	Trust	16	4.13	1.41	0.42	0.13	-0.11	0.2	0.21	0.11	0.24

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)

Table 3: Correlation Matrix for Questionnaire 2 Continued

	Variable	8	9	10	11	12	13	14	15	16	17
1	Communication										
2	Participation										
3	Self Interest										
4	Buy-In										
5	Job Security										
6	Tolerance for Change										
7	Change Implications (Job-Specific)										
8	Formal Procedures	(.90)									
9	Interactional Justice	.91**	(.88)								
10	Change Implications (Safety)	.63*	.60*	(.92)							
11	Change Implications (Quality)	.88**	.77**	.60*	(.75)						
12	Change Implications (Accuracy)	.73**	.79**	.56*	.65**	(.54)					
13	Computer Support	.68**	.70**	.59*	.68**	0.36	(.78)				
14	Training	.91**	.92**	.71**	.78**	.85**	.69**	(.91)			
15	Loss of Expertise	-0.43	-0.44	-0.48	-0.32	-0.32	-0.32	-.51*			
16	Bureaucracy	.62*	.76**	.55*	.60*	.57*	.64**	.75**	-0.48		
17	Trust	0.24	0.41	0.01	0.19	0.42	0.17	0.35	0.09	.66**	(.77)

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)
Cronbach's Alpha is on the diagonal when available.

Table 4: Correlation Matrix for Questionnaire 3 Continued

	Variable	8	9	10	11	12	13	14	15	16	17
1	Communication										
2	Participation										
3	Self Interest										
4	Buy-In										
5	Job Security										
6	Tolerance for Change										
7	Change Implications (Job-Specific)										
8	Formal Procedures	(.77)									
9	Interactional Justice	.84**	(.87)								
10	Change Implications (Safety)	.82**	.60*	(.89)							
11	Change Implications (Quality)	.58*	.51*	.65**	(.83)						
12	Change Implications (Accuracy)	.79**	.60*	.72**	.82**	(.86)					
13	Computer Support	.83**	.74**	.75**	.64**	.86**	(.63)				
14	Training	.86**	.62**	.90**	0.44	.79**	.87**	(.91)			
15	Loss of Expertise	-.54*	-0.4	-0.06	-0.24	-.54*	-0.36	-0.5			
16	Bureaucracy	.65**	.52*	.76**	0.47	.73**	.70**	.71**	-0.35		
17	Trust	.68**	.48*	.55*	0.16	.58*	.66**	.75**	-0.47	-.76**	(.91)

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)
Cronbach's Alpha is on the diagonal when available.

Table 5: Regression Analysis for Dependent Variable Buy-in			
Independent Variable	Questionnaire 1	Questionnaire 2	Questionnaire 3
Communication	.437** (.135)	.525** (.116)	.659*** (.151)
N	21	16	18
F-Test	10.49**	20.43**	19.03***
Adjusted R-Square	.322	.564	.515
Participation	.288† (.146)	.437* (.192)	.647** (.205)
N	21	16	17
F-Test	3.90†	5.18*	9.97**
Adjusted R-Square	.127	.218	.359
Formal Procedures	.400** (.123)	.536* (.195)	.657** (.162)
N	20	16	18
F-Test	10.56**	7.56*	16.52**
Adjusted R-Square	.335	.304	.477
Interactional Justice	.607*** (.129)	.522** (.169)	.771*** (.105)
N	22	16	18
F-Test	22.24***	9.57**	54.07***
Adjusted R-Square	.503	.364	.757
Self Interests	.768** (.264)	.913** (.236)	.665* (.200)
N	21	16	18
F-Test	8.48**	14.95**	11.03**
Adjusted R-Square	.272	.482	.371
Job Security	.546** (.158)	.450** (.130)	.476* (.164)
N	21	16	18
F-Test	11.91**	11.99**	8.49*
Adjusted R-Square	.353	.423	.306

Table 5: Regression Analysis for Dependent Variable Buy-in			
Independent Variable	Questionnaire 1	Questionnaire 2	Questionnaire 3
Understanding Change Implications (Job Specific)	.364† (.183)	.525* (.186)	.724** (.184)
N	22	16	18
F-Test	3.97†	8.00*	15.41**
Adjusted R-Square	.124	.318	.459
Tolerance For Change	.640** (.184)	.965*** (.144)	.964** (.298)
N	22	16	18
F-Test	12.14**	44.58***	10.50**
Adjusted R-Square	.347	.744	.358
Understanding Change Implications (Safety)	.389† (.209)	.537* (.194)	.637** (.168)
N	20	15	17
F-Test	3.48†	7.69*	14.34**
Adjusted R-Square	.115	.323	.455
Understanding Change Implications (Accuracy)	.395† (.206)	.332 (.267)	.636** (.156)
N	21	16	17
F-Test	3.69†	1.55	16.62**
Adjusted R-Square	.119	.035	.494
Understanding Change Implications (Quality)	.363† (.181)	.600** (.131)	.722** (.180)
N	21	15	18
F-Test	4.02†	20.95**	16.18**
Adjusted R-Square	.131	.588	.472

†p<.10, *p<.05, **p<.01, ***p<.001
Standard Errors are in parentheses

Hypotheses were tested by OLS regression using SPSS. The limited sample size reduced analysis to the measurement of one independent variable at a time against the dependent variable buy-in (See Table 5). The sample size was not large enough for a regression analysis using multiple independent variables in a single model. However, the regression analyses performed can be used to show preliminary trends in support or non-support for the hypotheses. They should not be used to determine statistical significance as they are only for exploratory analysis.

Hypothesis 1 claims that higher levels of communication will be positively related to employee buy-in. This hypothesis was supported by all three questionnaires. Hypothesis 2, Employee Participation, was not significant for questionnaire 1 but was a significant positive factor in analysis of questionnaires 2 and 3.

Each of these questionnaires captured the attitudes and beliefs of the clinic's employees at specific points in the implementation process. By the time data were collected in questionnaire 3, employees had been exposed to more cumulative communication regarding the need for the change than at any other tested point. With each successive questionnaire, employees likely realized consciously or subconsciously that communication was an important factor in the buy-in process. Similarly, employee participation likely increased in importance as more employees were able to participate in some decision-making in the change process. In the beginning, employees were allowed less input and spent more time in training, trying to grasp the complexities and scope of the EMR system. As time passed, employees were able to participate more in decisions such as redesigning job responsibilities and dividing tasks. As a result, employee participation became a more important factor in the buy-in decision process.

Hypotheses 3 and 4 are related to the formal procedures and interactional justice dimensions of procedural justice (Bies & Moag, 1986), and both had significant positive relationships to buy-in for all three rounds of questionnaires. In all three rounds, the interactional justice variable, which concerns how employees are treated in direct interactions with management, demonstrated a more significant relationship to buy-in than did the formal procedures variable, which concerns the general fairness in how office

procedures and policies are carried out. This finding supports the arguments of Bies and Moag (1986), who stated that actions taken by managers as they enact procedures and explain decisions (interactional justice) are instrumental in determining if procedural justice exists. With each successive questionnaire, employees would have had more experiences to draw upon in regards to direct interactions with management.

Hypothesis 5 pertains to satisfying employees' self interests. This independent variable was significant and positively related to buy-in during all three rounds of questionnaires. Job security, the variable tested in Hypothesis 6, was also found to have a significant positive relationship to buy-in during all three rounds of questionnaires.

Employees' understanding of the job-specific change implications of the change initiative, Hypothesis 7, was not significantly related to buy-in during questionnaire 1, but just barely so ($p=.060$). The mean for this variable was 4.30 with a standard deviation of 1.22. Therefore, it does not appear that an overwhelming majority of employees felt confident in their understanding of the change implications and how the EMR initiative would affect their jobs. Rather, this variable just missed being significant in round 1. This variable was significant in questionnaires 2 and 3. By the time questionnaire 3 was administered, employees had some level of experience with the EMR system and likely had a better understanding of how the change would affect their specific job duties. This is supported by the mean for this item in round three, which by then had increased to 5.24 on a seven point scale. Also, by the time questionnaire 3 data were collected, many employees had experienced changes in job duties and shifting responsibilities.

Hypothesis 8 states that employees with higher tolerances for change will also exhibit higher levels of buy-in. This hypothesis was supported in data analysis of all three questionnaires. Hypotheses 9, 10, and 11 pertain to the organization-level implications that implementation of the EMR system was designed to bring about (increased safety, quality, and accuracy). More specifically, these hypotheses state that employees' positive perceptions regarding the ability of the EMR system to bring about these implications will be positively related to buy-in. In questionnaire 1, none of these independent variables were found to be significant. However, these variables were just

barely insignificant ($p<.10$ for all three). The first questionnaire was conducted just prior to EMR implementation. At that time, employees did not yet have any real experience with the system and it is possible that they did not yet fully realize the effectiveness the EMR system would provide in these areas. This argument is supported by the results from questionnaires 2 and 3. In questionnaire 2, the variables safety and quality were found to be significant and positively related to buy-in, and by questionnaire 3, all three independent variables were found to be significant ($p<.01$, See Table 5).

Because the sample size in this study is relatively small, the control variables were run independently of the independent variables. Analysis of trends was also conducted using the correlation matrices for each questionnaire. In questionnaire 1, computer support was significantly correlated in positive fashion to communication, buy-in, formal procedures, and interactional justice. The other control variable with multiple significant positive correlations was training. This variable was significantly correlated with communication, employee participation, procedural justice, interactional justice, and computer support. The highest correlation was to communication. In other words, those employees generally satisfied with the level of communication regarding the need for the change initiative were are also generally satisfied with the level of training they received.

The correlation matrix for questionnaire 2 shows that training and computer support correlated significantly with several independent variables, but in the second questionnaire, the strength of the correlations increased. Correlation between training and communication, interactional justice, and formal procedures also increased. In the third questionnaire, the control variables computer support and training continued to remain strongly correlated in a positive fashion to these same independent variables. While these correlations cannot be used to support or refute any hypotheses and certainly do not establish a causal relationship, these matrices did reveal that computer support and training are strongly related to several of the independent variables, especially those mentioned above.

Table 6: Regression Analysis for Dependent Variable Buy-in and Control Variables						
Control Variable	All Controls	C1	C2	C3	C4	C5
Questionnaire 1						
Bureaucracy	-.286 (.354)	.364† (.199)				
Loss of Expertise	-.024 (.511)		-.325† (.181)			
Computer Support	.141 (.476)			.573** (.160)		
Training	.508 (.400)				.413** (.134)	
Trust	-.018 (.502)					-.074 (.192)
N	12	19	22	18	18	22
F-Test	1.15	3.36†	3.21†	12.84**	9.51**	.150
Adjusted R-Square	.100	.116	.095	.411	.334	-.042
Questionnaire 2						
Bureaucracy	.146 (.368)	.388* (.166)				
Loss of Expertise	.181 (.174)		-.075 (.160)			
Computer Support	.459† (.223)			.576*** (.123)		
Training	.140 (.201)				.374** (.134)	
Trust	-.111 (.279)					.155 (.204)
N	16	16	16	16	16	16
F-Test	3.87*	5.44*	.219	21.95***	7.75**	.573
Adjusted R-Square	.489	.228	-.055	.583	.310	-.02
Questionnaire 3						
Bureaucracy	.163 (.166)	.372* (.148)				
Loss of Expertise	-.063 (.145)		-.174 (.167)			

Table 6: Regression Analysis for Dependent Variable Buy-in and Control Variables						
Control Variable	All Controls	C1	C2	C3	C4	C5
Computer Support	.801* (.245)			.628*** (.115)		
Training	-.274 (.306)				.451** (.139)	
Trust	-.167 (.206)					.328 (.190)
N	15	16	16	18	16	18
F-Test	6.73**	6.34*	1.08	29.58***	10.45**	3.00
Adjusted R-Square	.672	.262	.005	.627	.387	.105

†p<.10, *p<.05, **p<.01, ***p<.001
Standard Errors are in parentheses

Regression analyses for the control variables for each questionnaire are in Table 6. Regression analyses of the control variables similarly revealed significant positive relationships between computer support and buy-in as well as between training and buy-in. Analysis from the first questionnaire shows that training and computer support were both significant ($p<.01$) with positive betas (See Table 6). In questionnaires 2 and 3, the level of significance of computer support's relationship to buy-in increased, while training continued to remain significant at the same level. Bureaucracy was also significant for questionnaires 2 and 3 but not in questionnaire 1 (See Table 6). After examining these results, it appears that training and computer support perhaps warrant additional investigation and should be considered for future study. These variables were apparently significantly important to employees undergoing the buy-in decision process in this change implementation. It is possible that respondents were not as aware of computer support issues at the time questionnaire 1 was administered (shortly before implementation began), but by questionnaires 2 and 3, this issue was more relevant. Training, on the other hand, was positively related to buy-in at all points, indicating that respondents considered this variable to be important at all three points tested.

The open-ended responses from each questionnaire help to explain some of the relevant issues in the office at each point tested in the implementation process. In questionnaire 1, when respondents were asked what could have improved the transition to the EMR system, the overwhelming majority of answers centered on the feeling that more time for training and practice with the system was needed prior to implementation. However, when asked what they would have done differently if placed in charge of the implementation process, no alternatives were submitted. These findings are consistent with the regression analysis testing training against the dependent variable.

In questionnaire 2, respondents were asked how their jobs had changed since implementation, and they were asked for examples of which tasks were made easier and which were made more difficult. The answers provided a mixture of both tasks made easier and those made more difficult. Tasks that were made easier were the result of information being more readily available and accessible by the computer. Those tasks felt to be more difficult were the result of "more steps" to complete them and an overall feeling that individual workload had increased. When asked for their opinion on the EMR system, all respondents' answers were positive. They indicated that patient information was more accessible through the computer and generally easier to find. A couple respondents noted that their opinion of the process would continue to improve as everyone learned how to use the system. Again, most complaints at this point centered on continuing to learn the system, related to training, and complaints about the computer system itself, which could be related to training and/or computer support.

Questionnaire 3 contained the most open-ended items, to provide detailed information about the EMR system from participants at this stage of the study. When asked for their opinion on the best part of the implementation process, respondents' answers were generally centered around the positive features of such an integrated computerized system, such as being able to find patient information easily, accessing it from multiple locations, having less paperwork, being able to track patient care, improving the overall quality of service provided, etc. When asked about the worst part of the implementation process, a major theme involved having too little time for

training and being forced to learn so much information in such a small amount of time. Another major theme focused on computer hardware/software issues. Complaints were voiced about the system kicking users out and shutting down, and there were several complaints about computer monitors being too small and not working properly. To a lesser extent, respondents also indicated encountering some resistance to adoption from fellow employees and having to deal with upset employees frustrated by the implementation. Again, these responses were consistent with the significance of training and computer support discovered in regression analyses of the control variables.

Respondents were again asked on questionnaire 3 for their overall opinion of the EMR system. Similar to the answers in questionnaire 2, most respondents reported that they generally liked the new system for the same reasons quoted previously but noted again that some people still had not mastered their job responsibilities. Respondents were also asked again which parts of their job were made easier and which parts were made more difficult by the EMR system. Of those tasks made easier, the reasons cited include easier access to information, better documentation, and timesaving measures realized by the use of integrated computers. Many respondents indicated that there were no parts of their job made more difficult by the EMR system. Only one respondent reported a difficulty caused by the EMR system, and this involved having to spend too much time on the computer. When asked how management had helped through the implementation process, respondents noted that management provided communication, meetings, step-by-step processes, and training. However, when asked how management could have improved the implementation process, the overwhelming response from respondents centered around offering more training prior to implementation.

DISCUSSION

By questionnaire 3, the small data set in this study showed patterns that suggested limited support for all the hypotheses (See Table 1). Data from all three questionnaires show that formal procedures and interactional justice were strongly related in a positive manner to buy-in. This indicates that

throughout the entire process, even before the implementation, employees' decisions regarding buy-in were positively related to their feelings about how they were being treated and how office procedures were being carried out. Again, while these findings are the results of just one EMR implementation experience, this should point out to managers how important the issue of fair treatment is to employees in their decision-making process of whether or not to accept a change and that this must be in place even before the change is implemented. It is quite possible that employees might resist a change based solely on feelings of being treated unfairly, which might not have anything to do with the merits of the change initiative.

For the second questionnaire, there was a positive relationship between tolerance for change and buy-in. At the time respondents completed questionnaire 2, just shortly after implementation, employees' individual tolerances for change received their greatest test. By this juncture, the office was experiencing most of their technical problems with the EMR software and had yet to resolve them. Those employees with a relative low tolerance for change would have struggled the most during this time. For a manager, this should re-emphasize why frequent communication, formal procedures, and interactional justice are so important. These variables must be correctly managed during difficult times to keep a change initiative on course.

In questionnaire 3, those variables with the highest p-values ($p<.001$) were communication and interactional justice. By this time in the implementation process, the organizational-level change implications (safety, quality, and accuracy) were also significant variables. It could be that it simply took some time for employees to experience some of the features and benefits of the EMR system to believe for themselves that this system could provide increased safety, quality, and accuracy, and this in turn resulted in the significant relationships to the dependent variable buy-in.

In the course of data collection, employee concerns about training came up in responses to the open-ended questions on all three questionnaires. Specifically, those who voiced an opinion on the matter felt that more training was needed prior to implementation. This qualitative data were supported by regression analysis of the control variable training, which shows that it was positively related to buy-in at all three data collection points. Switching to an

EMR system constitutes a rather radical shift in business processes for a medical facility. It is reasonable that with such a major change, employees might feel uncomfortable at the outset of implementation with the volume of training they received. However, the fact that employees were still mentioning this issue at four months into the full implementation is significant. It may be that those employees who feel that they were not properly trained prior to implementation still feel that they are lacking in ability. This control variable was found to have significant positive correlation to several of the independent variables, particularly to communication. The strength of this correlation increased with each survey. Although this project contains the results from just one EMR implementation site, future research on this topic may decide to include training as an independent variable to further test its significance in the buy-in process. Managers reviewing this study's findings should take note of how important the issue of training was to this group of employees and should plan accordingly before initiating significant change.

This study certainly has several limitations. Because the sample size was so small, the analyses of the hypotheses hold little conclusive power. The data analysis should be used only to show preliminary support or non-support for trends related to the hypotheses. A much larger sample encompassing a variety of clinical provider sites would be necessary to draw any well-supported conclusions.

As this project developed, it became more of a case study highlighting the EMR implementation process in one specific setting. Because the physicians' practice specialized (general surgery), it is quite possible that its employees experienced implementation issues that are relevant only in this setting and would not be found in a more widespread study of general practice clinics. Some of the background information uncovered during the study in regards to problems with setting up surgery-specific forms in the EMR software supports this assertion. Collecting data from only one site also leave the data vulnerable to other idiosyncratic traits of this one clinic. In other words, it would not be appropriate to take the findings on EMR implementation from this one isolated facility and try to generalize across an entire industry.

As mentioned in the introduction, further research in this area should encompass all the staff of a medical facility, not just the medical providers. An EMR system affects the job responsibilities of nearly every employee in a health care facility, and the job of coordinating and providing safe, accurate, high-quality care cannot be accomplished by a doctor alone. In order to get a broad perspective and a good enough sample size, employees from multiple clinics spanning multiple specialties plus general practitioner facilities should be evaluated. In addition to a questionnaire instrument, a selected sample of employee interviews would provide richer information and a second method of data collection.

A strength of this study was the collection of data at three different points in relation to the implementation of the change itself. The differing patterns of buy-in at the three different collection points, highlight the importance of studying this type of change with longitudinal data. The study also began an exploration of the role of the staff on the acceptance of this type of change. This is another important contribution of this study and future research in this area should also pay attention to this important element of the success of such a change.

CONCLUSION

While EMR technology has been around for several years, the majority of hospitals and private clinics have still yet to adopt such systems. Those who have navigated this transition have begun to experience some of the benefits this technology promises. This study examined a few key variables associated with the EMR implementation process and tested for relationships to employees' decision to buy-in to the change.

The quantitative and qualitative data collected in this study suggest that frequent communication is essential throughout the implementation process. Managers should not only provide higher levels of communication to employees in the days leading up to the launch of a change initiative but should continue to provide frequent communication throughout the implementation process, however long that may be. The data from this study indicate that the positive relationship between communication and buy-in was

significant in the weeks and months following the change initiative launch in addition to being significant in the days just preceding the launch. In the process of enacting change, managers might be tempted to use frequent communication up front before the launch of the change and then taper off communication once the initiative has begun, erroneously thinking that employees have received enough information to accept and adopt the change. However, this study suggests that frequent communication should remain a priority of management until the change initiative is fully accepted and integrated into the workplace as part of normal business processes.

Just as important as communication, the formal procedures in place and the fairness with which management treats employees in direct interaction are also positively related to the buy-in decision. In this particular study, both interactional justice and formal procedures had significant positive relationships in all three rounds of questionnaires. This highlights the importance of utilizing fairness in direct employee interactions. While an organization might have formal procedures that are viewed as being quite fair by employees, a manager who is careless about being fair in direct employee interactions could possibly cause employees to have an overall negative perception in regards to the organization's use of procedural justice. In addition to providing the frequent communication needed during the implementation of a change initiative, managers should be sure that all direct interaction with employees is conducted fairly.

While this study focused on just one organization's experience as it navigated EMR implementation, it highlights the importance that training plays in a change initiative and also the importance of good computer and technical support when the change involves computerized systems. Good training provided at the outset of a change initiative may be all that is necessary for some employees to embrace the change. However, the quantitative and qualitative data from this study indicate that training was still a relevant issue to employees at four months into the implementation process. For such a significant business process change like EMR implementation, perhaps employees would have benefited from refresher training sometime shortly after the launch.

This study provides insight on the implementation challenges faced by one surgical clinic and the solutions they implemented to stay on course. As time goes on, this technology will become the standard of care in medicine. Managers leading their organizations into such a change in the future can learn valuable lessons from early adopters such as the practice studied in this study.

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ATTITUDES TOWARDS BENEFITS AND BEHAVIORAL INTENTIONS AND THEIR RELATIONSHIP TO ABSENTEEISM, PERFORMANCE, AND TURNOVER AMONG NURSES

Shawn M. Carraher, Cameron University
M. Ronald Buckley, University of Oklahoma

ABSTRACT

The purpose of this study was to determine whether employees' attitudes towards benefits and behavioral intentions were related to nurse turnover, absenteeism, or on-the-job performance. Dramatic increases in the cost of benefits to employers, along with the need to attract and retain employees, have resulted in the requirement that the ramifications of employees' perceptions of benefits be better understood. Despite the fact that the literature is replete with studies involving pay equity and satisfaction, studies concerning the effects of perceived benefits are few.

Attitudes towards benefits, intentions to search for a new job, to quit, to be absent, ratings of performance, and actual turnover – and absenteeism - were assessed using a sample of 386 nurses. The results indicate that East of Replacement of Benefits was significantly related to turnover but not to absenteeism or performance. Behavioral intentions to Search for a new job, to quit, and intention to be absent were related to actual turnover and performance but not to absenteeism. The implications of these findings are discussed and areas for future research are presented.

INTRODUCTION

Despite the fact that the literature is replete with studies involving pay equity and satisfaction, studies including the effects of perceived benefits equity and satisfaction are few and largely methodologically deficient (see Dreher, Ash, & Bretz, 1988 and Williams, Brower, Ford, Williams, & Carraher, 2008). Salary comparisons (both external and internal) are usually the only determinant of pay equity in the literature. Since perceived equity is a function of the perception of outcomes received relative to inputs, it is plausible that other variables (such as benefits) would also influence perceptions of compensation equity and consequent satisfaction (Carraher & Carraher, 2005; Carraher 2006a).

Although receipt of benefits is usually not tied to performance, benefits are still an outcome associated with organizational membership and therefore personal inputs. Pinder (1976) notes that a problem with much of the research on equity is that it has tended to use pay as the only outcome. "But the theory claims that people may recognize a variety of outcomes as they form mental images about how equitably they are being treated, and many of these are nonpecuniary, as well as nonphysical" outcomes (1976, p. 122).

Greenburg (1988) corroborated the notion that employees perceive, and react to, the equity of outcomes that are nonmonetary. He found that employees adjusted their inputs (performance) to be consistent with the status level of the temporary office to which they were reassigned. Those employees who were reassigned to higher status offices increased their performance while those assigned to lower status offices reduced their performance in response to feelings of being inequitably underpaid.

Understanding the implications of employees' attitudes towards their benefits is important for a number of reasons. First, while indirect compensation (benefits) often accounted for about 5% of total compensation packages 50 to 70 years ago, they now typically account for 30 to 50% of total compensation packages with benefits growing at a rate faster than direct pay (Williams et al. 2008). While the costs of benefits to the employer have increased dramatically, there is solid evidence that employees grossly underestimate the cost of the benefits that they receive (Buckley, Carraher,

Carraher, Ferris, & Carraher, 2008; Carraher, 2006b; Carraher & Buckley, 2005; Wilson, Northcraft, & Neale, 1985). It would appear that instead of perceiving benefits as an added form of compensation, most employees perceive them as a "right," and not an added form of compensation. If employees don't value their benefits with a value equivalent to (or higher than) their direct costs, then the employer may be wasting money. When employees do not value their benefits at a value equal to or greater than their direct costs, then the money could be better used as a direct payment to facilitate the attraction, retention, and satisfaction of these employees. Therefore, as a first step, determining the extent to which employees value their benefits is important (Hart & Carraher, 1995).

Even if an employee undervalues a benefits package, this does not necessarily indicate that employees will be dissatisfied or experience inequity. Perhaps more important than understanding the value an employee places on benefits is understanding their perceptions of the benefits believed to be provided by other organizations. The absolute value of benefits packages can be easily calculated and communicated to employees to remedy the problem of undervaluation; however, establishing equity is a more complex issue because it involves a perceptual phenomenon. Assuming that employees consider nonpecuniary outcomes when determining equity (Williams et al. 2008), it is possible that perceptions of benefits have an effect upon perceptions of compensation equity, compensation satisfaction, and myriad other work attitudes and behaviors (Carraher, Hart, & Carraher, 2003).

Whether or not employees cognitively assess the value of their benefits and compare them to the packages believed to be offered by competing organizations is unknown. However, since benefits are touted as having the ability to attract and retain employees (Carraher, 2006b, Hart & Carraher, 1995; Mobley, 1982), perceived benefits inequity could result in the converse, namely dissatisfaction, higher levels of absenteeism, lower levels of performance, and higher turnover rates. The extent to which this may occur is unknown (Carraher et al., 2003).

In spite of the fact that an attempt has been made to better understand the role of benefits, most job and compensation satisfaction scales have failed to include items seeking to assess satisfaction with benefits. Heneman and

Schwab (1985) were some of the first to include benefit satisfaction as a subscale of a compensation satisfaction questionnaire with their Pay Satisfaction Questionnaire (PSQ). Although the PSQ includes the first established and readily available benefits scale, the stability and generalizability of the PSQ's factor structure has not yet been clearly established (Carraher & Buckley, 1996; Sturman & Carraher, 2007; Williams et al., 2008) and there has yet to be a consensus as to whether satisfaction with benefits in general should be seen as a unidimensional (e.g., Carraher, Mulvey, Scarpello, & Ash, 2004), bi-dimensional (e.g., Danehower, Miller, & Lust, 1990), or multi-dimensional (e.g., Miceli & Lane, 1991; Williams et al. 2008) construct.

Based on the problems associated with the PSQ and the lack of any other acceptable general benefits scale, there appeared to be a clear need to develop a valid benefits scale which would also measure perceptions of benefits equity and the perceived value of benefits. The Attitudes Towards Benefits Scale (ATBS) was developed to meet this need. The ATBS is a multi-dimensional scale which measures not only an individual's level of satisfaction with their benefits, but also the perceived importance of benefits, the ease of replacement of a benefits package, and the perceived cost of a benefit package (Carraher, 2006b; Carraher et al., 2003; Hart & Carraher, 1995).

Two decades ago Dreher, Ash, and Bretz (1988) suggested "there is a continuing need to examine the linkages between the dimensions of compensation satisfaction and important behavioral outcomes" (p. 25). This year Williams et al. (2008) have made the same argument – that little research has been performed examining dimensions of compensation satisfaction and their impact on important organizational outcomes such as turnover, absenteeism, and performance and that more research needs to be performed which would examine these relationships.

In 1981 Price and Mueller studied turnover among 1,091 nonsupervisory, registered nurses in seven rural short-term care facilities. With a base turnover rate of 20% in 14 months they found a correlation of -.404 between intention to stay and actual turnover. Three years later Steel and Ovalle (1984) performed a meta analysis of the relationship between

behavioral intentions and employee turnover. They found a weighted mean r of .45 between intention to leave and actual turnover. However the 90% credibility interval was .12 to .88 indicating a very wide range of observed correlations between intentions and actual behavior.

Shore, Newton, and Thornton (1990) used a sample of 566 university employees in order to examine a model of the relationship between organizational attitudes, job attitudes, and the behavioral intentions of turnover, absenteeism, and performance. Satisfaction, turnover, absenteeism, and performance have long been areas of interest in health care research for nurses (Berkowitz & Bennis, 1961; Bush-Brown, 1950; Cline, Reilly, & Moore, 2003; Cohen, 2006; Pfeffer & O'Reilly, 1987; Sommers, 1995; Weech-Maldonado, Dreachslin, Dansky, De Souza, & Gatto, 2002).

We hypothesize that the dimensions of attitudes towards benefits will be related to turnover, absenteeism, and performance. We also believe that intentions to search for a new job, to quit, and to be absent shall be related to actual turnover, absenteeism, and performance.

METHOD

Research Setting and Sample

Data were collected from a large primary care hospital in the Southwest. The employee population sampled consisted of nurses. The total sample (N=386) averaged 38 years of age, 7 years of tenure in their current position, and had 2.12 children. Total turnover in the 3 years of the study was 16.8% with 5.2% being in year 1, 7.5% in year 2, and 4.1% in year 3. In the six months of employee records examined 59.2% of the nurses were not absent. Complete confidentiality of each research participant was promised and while personnel administrators requested participation in the study, it was voluntary.

Procedural Overview

Employees were scheduled to meet in a central location to complete the employee attitude survey during their scheduled work time. Employees were given an unlimited amount of time to respond to the 206-question survey and it was completed without the presence of any supervisors or personnel administrators. Each employee was assured that the results of this study would be used only for research purposes.

In addition to the survey instrument, a performance appraisal measure was developed based upon employee interviews to determine critical work behaviors. Employees designated (via the survey cover sheet) which supervisor was in the best position to evaluate their performance. Supervisors were then provided packets of performance appraisals with rating forms including the names of subordinates who had designated them. It was again made clear that these appraisals would be used strictly for research purposes.

Employee "change of status reports" were completed on a monthly basis for three years. These reports allowed us to keep track of employee turnover.

Measures

The measures described below were extracted from a larger set of variables. One representative item from each scale will be presented along with the scale's description.

1. *Attitudes Towards Benefits Scale (ATBS)*. This six-item scale measures a variety of attitudes towards one's benefits. As indicated earlier a multi-dimensional scale was developed in order to measure various aspects of satisfaction with general benefits. Items 1 through 4 are responded to on seven point scales. Item 1 and Item 2 assess levels of satisfaction with benefits. They include the questions "How good are the benefits you currently receive compared to those received by others in similar organizations?" and "How satisfied are you with your current benefits package?" Item 3 asks "What are the chances

you could obtain a similar job with a better benefits package than you now receive?" which assesses the ease of replacement of benefits. Items 4 and 5 measure the importance of benefits to an individual and ask, "How important is your benefits package to you?" and "Would you trade your benefits package for its equivalent worth in cash?" (Circle "Yes" or "No"). The final item asks "What percentage of your salary would you guess your benefits package is worth?" which is answered on a nine-point scale with 5% increments ranging from 0% to 45% and seeks to assess the perceived cost of one's benefits package. Carraher et al. (2003) found 1-month test retest reliabilities of .90 to .95 for the ATBS dimensions.

2. *Performance*. Overall performance scores were obtained from the performance appraisal measures that were developed by the authors. Supervisors rated performance on specific behaviors as well as an overall rating from 1 to 9. The anchors ranged from "Poor Performer" (a replacement employee would outperform, ranging from 1 to 3) through "Average Performer" (a replacement employee would perform about the same as this employee, ranging from 4 to 6 on the scale) to "Good Performer" (employee would be difficult to replace, ranging from 7 to 9). Ratings were done 6 months after the initial data collection.

3. *Turnover*. As indicated previously turnover was followed over a three year period of time and came from organizational records. Only voluntary turnover was included.

4. *Absenteeism*. Absenteeism was followed over a six-month period of time and came from organizational records.

5. *Behavioral Intentions to Search*. This scale is comprised of three items that are responded to on a seven point Likert scale ranging from "Very Unlikely" to "Certain." An example question is "How likely is it that you will search for alternative employment?"

6. *Behavioral Intentions to Quit*. These four items as well as the intentions to search items were adopted from Mobley, Horner, and Hollingsworth (1978) with items scaled from 1 to 7 as opposed to 1 to 5 in the original scale. "How often do you think about resigning from your current job?" is an example of an intention to quit item (rated from "Never" to "Constantly").

7. *Behavioral Intentions to be Absent*. These four questions seek to assess the extent to which an employee expects and desires to be absent from work (excluding leave of absences, illness, vacations, and holidays). These items have a seven-point scale and an example item is "All things considered, how desirable is attending work?" (Rated from "Very desirable" to "Very undesirable"). This scale was adopted from Sawyer's work (1992).

Results

Table 1 shows the zero order correlations between the four parts of the ATBS and the three variables of interest – turnover, absenteeism, and performance.

Table 1 Correlations

		bensat	benimp	benease	Worth of Benefits	Performance	Turnover	Absenteeism
Bensat	Pearson Correlation	1	.279**	-.226**	.728**	-0.029	0.022	-0.038
	Sig. (2-tailed)		0	0	0	0.652	0.675	0.549
	N	370	366	368	370	252	370	251
Benimp	Pearson Correlation	.279**	1	-.798**	.140**	0.064	0.065	-0.111
	Sig. (2-tailed)	0		0	0.007	0.306	0.208	0.076
	N	366	382	382	372	261	382	259

Table 1 Correlations

		bensat	benimp	benease	Worth of Benefits	Performance	Turnover	Absenteeism
Benease	Pearson Correlation	-.226**	-.798**	1	-.129*	-0.074	-.123*	0.084
	Sig. (2-tailed)	0	0		0.013	0.234	0.016	0.177
	N	368	382	384	374	263	384	261
Worth of Benefits	Pearson Correlation	.728**	.140**	-.129*	1	-0.017	0.072	-0.116
	Sig. (2-tailed)	0	0.007	0.013		0.79	0.165	0.064
	N	370	372	374	376	258	376	256
Performance	Pearson Correlation	-0.029	0.064	-0.074	-0.017	1	.152*	-.309**
	Sig. (2-tailed)	0.652	0.306	0.234	0.79		0.014	0
	N	252	261	263	258	264	264	255
Turn-over	Pearson Correlation	0.022	0.065	-.123*	0.072	.152*	1	-.189**
	Sig. (2-tailed)	0.675	0.208	0.016	0.165	0.014		0.002
	N	370	382	384	376	264	386	262
Absent-eism	Pearson Correlation	-0.038	-0.111	0.084	-0.116	-.309**	-.189**	1
	Sig. (2-tailed)	0.549	0.076	0.177	0.064	0	0.002	
	N	251	259	261	256	255	262	262

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 2 Correlations

		Turnover	Absenteeism	Performance	Behavioral Intention to Quit	Behavioral Intention to Search	Behavioral Intention to be Absent
Turnover	Pearson Correlation	1	-.189**	.152*	-.204**	-.216**	-0.08
	Sig. (2-tailed)		0.002	0.014	0	0	0.123
	N	386	262	264	382	378	374
Absenteeism	Pearson Correlation	-.189**	1	-.309**	0.052	0.106	.140*
	Sig. (2-tailed)	0.002		0	0.409	0.092	0.027
	N	262	262	255	258	255	252
Performance	Pearson Correlation	.152*	-.309**	1	-.122*	-.168**	-.139*
	Sig. (2-tailed)	0.014	0		0.049	0.007	0.027
	N	264	255	264	260	257	253
Behavioral Intention to Quit	Pearson Correlation	-.204**	0.052	-.122*	1	.567**	.469**
	Sig. (2-tailed)	0	0.409	0.049		0	0
	N	382	258	260	382	375	371
Behavioral Intention to Search	Pearson Correlation	-.216**	0.106	-.168**	.567**	1	.308**
	Sig. (2-tailed)	0	0.092	0.007	0		0
	N	378	255	257	375	378	371
Behavioral Intention to be Absent	Pearson Correlation	-0.08	.140*	-.139*	.469**	.308**	1
	Sig. (2-tailed)	0.123	0.027	0.027	0	0	
	N	374	252	253	371	371	374

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

As can be seen in Table 1, there are seven correlations that are significant at or beyond the .05 level. Six of these however are between the ATBS dimensions. The one significant correlation between the ATBS dimensions and the variables of interest are between the East of Replacement of Benefits and Turnover ($r = -.123$, $p<.016$).

As can be seen in Table 2, there are twelve correlations that are significant at or beyond the .05 level. Of these twelve, three are between the outcome variables of turnover, absenteeism, and performance with the correlations between absenteeism and turnover being ($r = -.189$, $p<.002$), between turnover and performance ($r = .152$, $p<.014$), and between absenteeism and performance ($r = -.309$, $p<.001$) indicating that those who are absent more are more likely to leave, those with lower performance are more likely to leave, and those with higher performance are less likely to be absent. The other nine significant correlations are between turnover and Behavioral Intention to Quit ($r = -.204$, $p<.001$) and Search ($r = -.216$, $p<.001$), Absenteeism and Intentions to be Absent ($r=.140$, $p<.027$), performance and all three Behavioral Intentions (Quit, $r = -.122$, $p<.049$), (Search, $r = -.168$, $p<.007$), (Absent, $r = -.139$, $p<.027$); and between the three Behavioral Intentions.

We also used multiple regressions in order to assess the predictive capacities of the four parts of the ATBS and the three Behavioral Intentions at predicting turnover, absenteeism, and performance. These are shown in Tables 3 and 4.

Turning to Table 3, the Ease of Replacement of Benefits was significantly related to Turnover (Sig. = .013) and the Worth of Benefits was significantly related to Absenteeism (Sig. = .036) but the only significant overall regression equation was for turnover ($R = .173$, $p<.024$). Even then the percentage of variance accounted for was not very high (3.1%). Attitudes towards benefits were not significant predictors of Absenteeism ($R = .170$, $p<.128$) or Performance ($R = .111$, $p<.549$).

Table 3 – Regression of ATBS factors with Turnover, Absenteeism, & Performance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Turnover R= .173 R squared = .031 Sig. = .024						
1	(Constant)	10.177	0.874		11.65	0
	Bensat	-0.188	0.164	-0.09	-1.147	0.252
	Benimp	-0.073	0.079	-0.081	-0.924	0.356
	Benease	-0.193	0.078	-0.215	-2.491	0.013
	Ben worth	0.15	0.098	0.117	1.529	0.127
Absenteeism R = .170 R Squared = .029 Sig. = .128						
1	(Constant)	2.015	0.951		2.119	0.035
	Bensat	0.253	0.179	0.134	1.416	0.158
	Benimp	-0.109	0.088	-0.125	-1.249	0.213
	Benease	-0.024	0.084	-0.028	-0.287	0.774
	Ben worth	-0.227	0.108	-0.197	-2.112	0.036
Performance R = .111 R Squared = .012 Sig. = .549						
1	(Constant)	2.627	0.218		12.069	0
	Bensat	-0.03	0.04	-0.073	-0.764	0.446
	Benimp	0.003	0.02	0.017	0.168	0.866
	Benease	-0.018	0.019	-0.094	-0.929	0.354
	Ben worth	0.005	0.024	0.02	0.216	0.829

Looking at Table 4, all three of the equations were significant at the .1 level (Turnover, R=.228, p<.0001), (Absenteeism, R = .165, p<.08), (Performance, R = .198, p<.02) but the relationships were not strong and the percentage of variance accounted for was not great (2.7 % to 5.2%).

Interestingly in the three multiple regressions the Behavioral Intention to Quit was not a significant predictor of Turnover, Absenteeism, or Performance at the .05 level. The Behavioral Intent to Search was a significant predictor of both Turnover ($p<.013$) and Performance ($p<.034$). The Behavioral Intent to be Absent was found to be a significant predictor of Absenteeism ($p<.042$).

Table 4 – Regressions of Turnover, Absenteeism, & Performance with Behavioral Intentions to Search, Quit, and Absenteeism

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Turnover R = .228 R squared = .052 Sig. = .0001						
1	(Constant)	9.755	0.442		22.07	0
	Search	-0.082	0.033	-0.155	-2.509	0.013
	Quit	-0.068	0.04	-0.114	-1.714	0.087
	Absent	0.02	0.045	0.025	0.438	0.662
Absent R = .165 R squared = .027 Sig. = .08						
1	(Constant)	0.481	0.501		0.961	0.338
	Search	0.056	0.037	0.116	1.499	0.135
	Quit	-0.045	0.045	-0.084	-1.008	0.315
	Absent	0.102	0.05	0.144	2.049	0.042
Performance R = .198 R squared = .039 Sig. = .020						
1	(Constant)	2.675	0.112		23.935	0
	Search	-0.018	0.008	-0.163	-2.138	0.034
	Quit	0.004	0.01	0.032	0.391	0.696
	Absent	-0.017	0.011	-0.106	-1.517	0.131

DISCUSSION

The results of this study indicate that attitudes towards benefits are not predictive of absenteeism or performance and weak predictors of turnover. These findings are not consistent with the speculations of others (Mobley, 1982); that is, benefits perceptions may be instrumental in both the retention and attraction of employees. They are, however, consistent with previous findings when it comes to other populations that have lower turnover rates and see few options for moving up. Carraher and Buckley (2005) found that the ATBS dimensions were not related to turnover among entrepreneurs in Western Europe. On the other hand, Carraher (2006b) found that Ease of Replacement of Benefits was able to predict entrepreneurial turnover in Eastern Europe when the entrepreneurs were able to find options that would increase their incomes. It was surprising that while the behavioral intentions scales were significantly related to turnover, absenteeism, and performance the relationships were not very strong. When looking at practical significance or meaningfulness rather than at statistical significance, none of the relationships, while they are statistically significant, appear to be particularly meaningful suggesting that we should look elsewhere to explain turnover, absenteeism, and performance.

FUTURE RESEARCH AND CONCLUSIONS

There are several directions which future research could develop. The first area for research would be to examine why turnover rates might vary so significantly from hospital to hospital. For instance in North Carolina hospitals averaged a 15% turnover rate for RN's (Thrall, 2005) while in the present sample we had an average of about 3.5%. In hospitals in rural areas of Oklahoma it is not uncommon to have over 50% of first year nurses turnover after the first year. Post hoc we talked with several focus groups of nurses in order to see why outstanding nurses chose to stay. What was reported was that nurses who were unhappy in one work setting chose voluntary transfers to another work setting rather than leaving the organization. What had attracted the nurses to the hospital was that it was

seen as having a very high organizational status as well as being in a desirable location (Anderson, 1995). Dalton and Mesch (1992) have previously studied voluntary transfers with respect to absenteeism but to the best of our knowledge it has not been examined as an alternative to turnover. It has been previously suggested as an area for research in healthcare management for nurses (Greenhalgh & Adler, 1983). We had expected that job mobility; pay level, benefit, and employee worklife (Burke & Greenglass, 2001; Sousa-Poza & Henneberger, 2004; Waite, 1987; Wheeler, Gallagher, Brouer, & Sablynski, 2007) issues would be mentioned. They were mentioned as reasons that had attracted the nurses to the hospital but not reasons for quitting. The reasons behind seeking voluntary transfers largely focused on either leadership/management issues such as disagreements with supervisors or strategic family worklife issues such as seeking to shift to a different work schedule for one's spouse or children (Carraher, Scott, & Carraher, 2004; Parnell & Carraher, 2001).

A second area for research would examine how attitudes towards benefits should be measured for nurses. This study addresses general attitudes towards benefits in a static multi-dimensional manner. Several possible research questions could include whether or not general attitudes towards benefits should be seen as a static or a dynamic concept or consisting of both static and dynamic dimensions. If there are dynamic aspects to attitudes towards benefits for nurses then what are the constructs that would be dynamic? Would they be the same, similar, or quite different from the static dimensions? In terms of general static attitudes towards benefits, while the instrument used here has four dimensions, another by Harris (1993) attempts to measure ten dimensions of general attitudes towards benefits. Balkin and Griffeth (1992), on the other hand, have developed an instrument that seeks to measure attitudes towards five specific benefits in a multi-dimensional fashion. Williams et al. (2008) developed a measure that purports to measure three general dimensions of attitudes towards benefits.

In the area of experimentation, research could focus on several different areas. One possible area of focus could be the further testing of the usefulness of attitudes towards benefits as predictors of other organizationally important phenomenon such as continuing education (Parnell & Carraher,

2003), willingness to serve as a mentor (Carraher, Sullivan, & Crocitto, 2008), work norms (Carraher, Carraher & Whitely, 2003; Carraher & Whitely, 1998), customer service (Chait, Carraher, & Buckley, 2000) or expectations (Buckley, Fedor, Carraher, Frink, & Marvin, 1997; Buckley, Fedor, Veres, Wiese, & Carraher, 1998; Buckley, Mobbs, Mendoza, Novicevic, Carraher, & Beu, 2002). For instance do benefits attract nurses to a place of employment as indicated in our focus groups? Is a better benefit package able to attract senior nurses away from an existing job and if so which aspects of benefits are important? In the area of behavioral intentions research could examine the level at which intentions are turned in to action and at what level of dissatisfaction one starts to develop an intention to search for another job or to quit one's current job. At what level do intentions about absenteeism turn in to an unexcused absence for a nurse? What other factors might come in to play to influence intentions to search for a new job, to quit, or even to skip a single (or multiple) days of work? Additionally how might these differ for other employee groups in the healthcare field (Wilson, Carraher, Carraher, Ferris, & Carraher, 2008)? These should be explored empirically.

A common complaint is that research on benefits and organizational implications tends to be atheoretical. We have very little good theory guiding us as to what attitudes towards benefits actually are, what causes them, what individual characteristics may moderate them, and how they differ from benefits equity. It would appear that we are still in our infancy with respect to theorizing about benefits – especially how benefits influence the behaviors of nurses. We need to be active in the development of new theories and seeking to identify what old theories may be of interest. The nurses from this study indicated that benefits were important in terms of attracting them to their current job but they were not important at retaining them. They were generally happy with their jobs and for the most part did not intend to leave, search for new jobs, or even be absent from work.

In conclusion, utilizing a sample of 386 nurses in a primary care facility in the SouthWest we examined whether or not attitudes towards benefits and behavioral intentions could predict turnover, absenteeism, and performance. While statistically significant results were found, the percentage of variance accounted for was not very high. This was likely because of very

low base rates of turnover and absenteeism caused by organizational attractiveness. Future areas for research are suggested.

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