A Case Study of Assessing Employee Satisfaction from A Regional Teaching Hospital in Taiwan

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Abstract—**This study is to identify critical demographic variables having significant influences on each dimension of the employee satisfaction scale. Assessing employees' job satisfaction is important for healthcare organizations to address employees' needs. The internal survey data in 2018 from a regional teaching hospital in Taiwan are used. Mann-Whitney U test and one-way analysis of variance are employed for analyses. Experience in organization is the most essential demographic variable that has significant impacts on five out of seven dimensions followed by supervisor/manager and job position. Medical staff whose experience in this hospital is less than 1 year are more satisfied in salary and benefits, promotion and appraisal system, colleagues, supervisors, and work itself as well as two of three questions of the overall satisfaction in general. In contrast, employees whose experiences are 7-9 years have the lowest satisfaction in salary and benefits statistically. Hospital management can initiate activities to improve staffs' job satisfaction through experience in organization in a high priority. Work itself affected by six demographic variables is the dimension to be further analyzed in order to improve employee satisfactions.**

Index Terms— **employee satisfaction scale, job satisfaction, demographic variable, regional teaching hospital, Mann-Whitney U test, one-way analysis of variance**

I. Introduction

Al-Fakeh et al. [1] stated that employee satisfaction which is essential to the development of any organization is directly related to the productivity and personal prosperity. Employee satisfaction is also a significant determinant of employee performance and may influence organization performance. Ghiselli et al. [2] and Mrayyan [3] further described that employee satisfaction is essential in the human resources management field, and the higher employee satisfaction, the lower turnover rate. Besides, Chi and Gursoy [4] mentioned that the more the employee satisfaction, the more the economic benefits obtained by the organization. Moreover, Lee et al. [5] reported that satisfied employees are a key factor to meet the needs for the patients' quality care and would have the most significant impact on the healthcare industry.

The study conducted by Bjørk et al. [6] showed that nurses' satisfaction with their jobs has been viewed as an important factor to link with employee turnover and the quality of nursing care in Norway. Blaauw et al. [7] also reported that job satisfaction is an important determinant of healthcare worker motivation, retention, and performance and is statistically related to intention to leave. Lee et al. [5] emphasized that factors leading to job satisfaction may change over time and it would be recommended to assess employee satisfaction periodically. Based on the above findings, employee (job) satisfaction is essential and may change over time. Therefore, it is necessary to periodically assess the job satisfaction to understand what employees' needs are in the healthcare industry [5].

The study conducted by Boafo [8] showed that nurses in different geographical and socio-cultural settings might have different critical factors to influence job satisfaction levels. Bjørk et al. [6] pointed out that age, education, and number of years in the hospital and in the unit could be the significant factors to affect nurses' job satisfaction. Coomber and Barriball [9] also concluded that education is associated with nurses' job satisfaction. In addition to nurses, other medical staff with different demographic variables might perceive job satisfactions differently. Thus, there is a need to assess employee satisfaction in a particular hospital for medical staff with different job positions as well as with different demographic variables.

This study uses a regional teaching hospital in Taiwan as an example, where this hospital developed its own employee satisfaction scale based upon a rigorous study conducted by Hsieh et al. [10]. Since 2014, the employee satisfaction scale was implemented into this case hospital to regularly evaluate medical staff's job satisfaction in December annually. It is worth to analyze if medical staff with different demographic variables perceive their job satisfaction statistically different since job satisfaction is an important factor to affect the patients' care of quality, employees' turnover, and

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organization performance.

II. The Employee Satisfaction Scale

Before the case hospital begins to use the employee satisfaction scale in December 2014, there was a questionnaire used to assess the employee satisfaction. However, there was no literature support for each question, and, more importantly, the questionnaire has not been validated. Therefore, this hospital began its development of the employee satisfaction scale to assess medical staff's job satisfaction with a strong theoretical background.

The procedure of developing the employee satisfaction scale is summarized below briefly [10]. A literature review was performed to screen potential dimensions of employee satisfaction from recognizable journals including Academy of Management Journal, MIS Quarterly, Total Quality Management & Business Excellence, Journal of Management, Journal of Applied Psychology, Small Business Economics, Organizational Research Methods, Personnel Review, Journal of Management Studies, Croatian Medical Journal, Journal of Organizational Behavior, Research Policy, Academy of Management Learning & Education, Tourism Management, The Leadership Quarterly, and Asia Pacific Journal of Management. In the beginning, eleven dimensions were found from 31 studies, but the selection criterion for each dimension based on the frequency of the appearance of the dimension was four. That is, policy and management practices and achievement and motivation were removed. In addition, by considering the environment of the hospital in Taiwan, working environment and professional guarantee were deleted. Therefore, only seven dimensions were kept including salary and benefits, education training and development, promotion and evaluation system, colleague, supervisor, employee autonomy and empowerment, and the work itself.

Pretest was conducted with 250 samples and 150 valid survey results were used to perform exploratory factor analysis. Later, confirmatory factor analysis was conducted based on 906 samples with 524 valid survey results. Moreover, model fit for measurement model, fit of internal structure of model, and measurement model respecification were examined. Finally, the employee satisfaction scale has seven dimensions and 34 items, i.e., 7 items of salary and welfare, 4 items of employee educational training and development, 4 items of promotion and appraisal system, 5 items of colleague relationship, 4 items of interactions with supervisors, 5 items of employee autonomy and empowerment, and 5 items of work itself [10].

The meanings of these seven dimensions are summarized below briefly [10]. Salary and benefits is defined as employees spend effort and labor in an organization to obtain the salary that they deserve. In addition to a reasonable salary, complete welfare and an allowance system is included. Education training and development set up by an organization enables employees to have opportunities to lean relentlessly. In practice, employees usually have some expectations towards their own job development. Therefore, the provision of abundant learning resources and planning employees' personal development would influence employee satisfaction. Promotion and appraisal system provides employees a direction and a basis for their efforts.

Colleague relationship describes if employees can work as a team since good performance or strong interest in the work of colleagues will usually affect the satisfaction of other employees. Besides, knowledge, skills, interactions, communications, and cooperation among colleagues also influence employee satisfaction. Interactions with supervisors are defined as if supervisors are willing to listen to and understand employees' ideas and needs, communicate with employees, and support them in a timely manner such that subordinates feel respected and identify themselves with supervisors. Employee autonomy and empowerment is to describe employees' desire to win recognition from an organization and possess full autonomy at work to freely arrange work affairs and progress. Work itself can be viewed as employee's emotional experiences developed from the work or work experiences according to their personal evaluation.

The detailed information can be found in Hsieh et al. [10]. To meet the special needs of this case hospital, three questions of the overall satisfaction were included to evaluate medical staff's loyalty. These three questions are as follows: 1. I am satisfied with working in this hospital; 2. I think I belong to this hospital; and 3. I think I will continue to work in this hospital in the future.

III. Research Method

This study collects the internal survey data electronically based on the entire medical staff in December 13-28, 2018 from a regional teaching hospital located in Taichung City, Taiwan. The selected regional teaching hospital has more than 30 divisions with more than 700 hospital staff along with 500 hospital beds, and the nurse-patient ratio is around 10.3 in 2016. This hospital is one of the best general and teaching hospitals in Taiwan [11,12,13]. This hospital conducts its annual employee satisfaction assessment using its employee satisfaction scale in December each year through its internal website. During the survey, 639 employees finished the online questionnaire, but 73 respondents did not specify their job positions clearly. Therefore, the effective number of medical staff used in this study is 566 in 2018.

From Table I, the majority of medical staff are female (79.3%) whose ages fall in five categories including 25 years and below (17.7%), 26-30 years (16.3%), 31-35 years (14.3%), 36-40 years (18.0%), and 41-45 years (15.0%). More than 62% of the medical staff have university degrees. The experience in this organization for the majority of medical staff falls in either 1 to 3 years (25.8%) or 10 years or more (36.4%). Nearly 84% of the respondents are not supervisors/managers. Finally, nurses are the major composition in this survey with 54.6% followed by administrative staff with 21.6% and technician staff with 16.1%.

TABLE I
DEMOGRAPHIC VARIABLES OF ENTIRE MEDICAL STAFF IN THIS CASE HOSPITAL IN 2018

Demographic Variable	Frequency	Percentage
Gender		
Male	117	20.7
Female	449	79.3
Age		
25 years old and below	100	17.7
26-30 years old	92	16.3
31-35 years old	81	14.3
36-40 years old	102	18.0
41-45 years old	85	15.0
46-50 years old	51	9.0
51 years old and above	55	9.7
Marital Status		
Single	264	46.6
Married	290	51.2
Divorced	12	1.8
Widowed	2	0.4
Education		
Junior High School Degree and below	3	0.5
Senior High School Degree	16	2.8
College Degree	142	25.1
University Degree	352	62.2
Master's Degree	50	8.8
Doctoral Degree	3	0.5
Experience in Organization		
Less than 1 year	87	15.4
1 to 3 years	146	25.8
4 to 6 years	70	12.4
7 to 9 years	57	10.1
10 years or more	206	36.4
Supervisor/Manager		
Yes	91	16.1
No	475	83.9
Job Position		
Physician	44	7.8
Nurse	309	54.6
Technician Staff	91	16.1
Administrative Staff	122	21.6

Each question in the employee satisfaction scale uses a 5-point Likert's scale to all responses ranging from 1 = strongly disagree to 5 = strongly agree. Besides, each question in the overall satisfaction uses the same scale for the respondents. The score of each dimension is to first aggregate the scores of the individual questions from that particular dimension and then divide the number of questions. The demographic variables include gender, age, marital status, education, experience in organization, supervisor/manager, and job position. In practice, the score aggregated by each dimension might not be distributed normally such that the Mann-Whitney U test for two independent samples test is more appropriate to use [14,15]. This study employs Mann-Whitney U test for two independent samples test and one-way analysis of variance (ANOVA) to measure if demographic variables play an essential role to influence dimensions [16].

Specifically, Mann-Whitney U test will be performed to determine if medical staff with different gender and supervisor/manager might perceive employee satisfaction statistically different. In contrast, one-way ANOVA will be used to determine if medical staff with different age, marital status, education, experience in organization, and job position might perceive employee satisfaction different significantly. Therefore, this study employs both methods with $\alpha = 0.05$ to evaluate these seven dimensions of the employee satisfaction scale as well as three questions of the overall satisfaction. If the p value is less than 0.05, the Bonferroni method is chosen for post hoc analysis except for gender and supervisor/manager with only two levels. The major advantage of using Bonferroni method is that it reduces the probability of a Type I error and can test complex pairs of multiple comparisons [17].

IV. RESULTS

Mann-Whitney U test is performed to evaluate if gender and supervisor/manager result in different employee satisfactions. Table II shows that male medical staff have significantly higher satisfactions in colleagues, supervisors, and work itself than female medical staff. On the other hand, both male and female medical staff do not have different satisfactions in salary and benefits, employee education training and development, promotion and appraisal system, and employee autonomy and empowerment statistically.

TABLE II
MEAN DIFFERENCES ON SEVEN DIMENSIONS FOR GENDER AND SUPERVISOR/MANAGER

Dimension	Variable	Mann-Whitney U Test	Exact Sig. (2-tailed)	Post Hoc
Salary and benefits	Gender	24398.0	0.223	
	Supervisor/ Manager	19133.5	0.075	
Employee education training and development	Gender	25258.5	0.512	
	Supervisor/ Manager	19133.5	0.076	
Promotion and appraisal system	Gender	24806.5	0.332	
	Supervisor/ Manager	17331.5	0.002	Yes > No
Colleagues	Gender	22330.5	0.010	M > F
	Supervisor/ Manager	19044.0	0.064	
Supervisors	Gender	22415.5	0.012	M > F
	Supervisor/ Manager	17074.0	0.001	Yes > No
Employee autonomy and empowerment	Gender	23641.0	0.089	
	Supervisor/ Manager	18219.0	0.016	Yes > No
Work itself	Gender	22169.0	0.008	M > F
	Supervisor/ Manager	17376.5	0.003	Yes > No

Note: M and F in post hoc column represent male and female, respectively.

Medical staff who are in charge of supervisors/managers are more satisfied statistically in promotion and appraisal system, supervisors, employee autonomy and empowerment, and work itself than medical staff who are not supervisors/managers. In contrast, supervisor/manager is not a significant factor to influence employee satisfactions in salary and benefits, employee education training and development, and colleagues. In summary, supervisor/manager is more important than gender because supervisor/manager affects four out of seven dimensions of the employee satisfaction scale. On the other hand, gender influences three of seven dimensions of the employee satisfaction scale.

Table III shows that age is a significant variable to influence salary and benefits, promotion and appraisal system, and work itself. No significant differences within

age groups in salary and benefits and work itself are found in the post hoc analysis. However, medical staff whose ages are 25 years and below are more satisfied than those whose ages are 31-35 years in promotion and appraisal system statistically. Marital status is not a critical variable to influence these seven dimensions. Education affects employee satisfactions in salary and benefits, colleagues, employee autonomy and empowerment, and work itself. For the post hoc analyses, staff with master's degrees are more satisfied than those with junior college degree in colleagues and work itself. No significant difference exists within salary and benefits and employee autonomy and empowerment. Experience in organization affects five out of seven dimensions except for employee education training and development and employee autonomy and empowerment. The post hoc analysis shows that medical staff who have 7-9 years of experience in this hospital have the lowest satisfaction in salary and benefits.

Job position plays a vital role in salary and benefits, promotion and appraisal system, colleagues, and work itself. The post hoc analysis illustrates both physicians and administrative staff are more satisfied in salary and benefits than technician staff statistically. Nurses feel satisfied statistically than technician staff in promotion and appraisal system, while technician staff are satisfied statistically than administrative staff in promotion and appraisal system. Both technician staff and administrative staff are more satisfied significantly than nurses in colleagues. Moreover, physicians have higher satisfactions than nurses and administrative staff in work itself. Based on Table III, marital status is the least important variable among demographic variables, whereas experience in organization and job position have more influences on the dimensions of the employee satisfaction scale.

Three additional questions regarding the overall satisfaction about the case hospital have been analyzed by Mann-Whitney U test with $\alpha = 0.05$. Both gender and supervisor/manager have significant impacts on these three questions statistically. Specifically, male medical staff are more satisfied statistically than female counterparts in these three questions as shown in Table IV. That is, male staff are more satisfied to work in this hospital, think they belong to this hospital, and are willing to continue to work in this hospital in the future. In contrast to gender, medical staff who are supervisors/managers are more satisfied significantly than those who are not supervisors/managers in these three questions. That is, staff who are in charge of supervisors/managers are more satisfied to work in this hospital, think they belong to this hospital, and will continue to work in this hospital in the future.

TABLE III
ANOVA RESULTS ON SEVEN DIMENSIONS

Dimension	Variable	F	Sig.	Post Hoc
Salary and benefits	Age	2.120	0.049	None
	Marital status	0.911	0.435	
	Education	2.680	0.021	None
	Experience in organization	6.047	<0.001	less than 1 year > 7-9 years; 1-3 years > 7-9 years; 4-6 years > 7-9 years; 10 years or more > 7-9 years
	Job position	4.920	0.002	physician > technician staff; administrative staff > technician staff
Employee education training and development	Age	1.410	0.208	
	Marital status	0.060	0.981	
	Education	1.617	0.154	
	Experience in organization	2.345	0.054	
	Job position	0.222	0.881	
Promotion and appraisal system	Age	2.190	0.042	25 years old and below > 31-35 years old
	Marital status	1.041	0.374	
	Education	1.271	0.275	
	Experience in organization	3.356	0.010	less than 1 year > 7-9 years; less than 1 year > 10 years or more
	Job position	4.699	0.003	nurse > technician staff; technician staff > administrative staff
Colleagues	Age	1.014	0.415	
	Marital status	0.110	0.954	
	Education	3.475	0.004	master's degree > junior college degree
	Experience in organization	3.113	0.015	less than 1 year > 7-9 years
	Job position	5.281	0.001	technician staff > nurse; administrative staff > nurse
Supervisors	Age	0.924	0.477	
	Marital status	0.290	0.833	
	Education	1.724	0.127	
	Experience in organization	4.345	0.002	less than 1 year > 1-3 years; less than 1 year > 7-9 years
	Job position	2.204	0.087	
Employee autonomy and empowerment	Age	1.841	0.089	
	Marital status	0.221	0.882	
	Education	2.879	0.014	None
	Experience in organization	1.870	0.114	
	Job position	0.831	0.477	
Work itself	Age	3.109	0.005	None
	Marital status	2.246	0.082	
	Education	3.645	0.003	master's degree > junior college degree
	Experience in organization	3.263	0.012	less than 1 year > 7-9 years
	Job position	3.945	0.008	physician > nurse; physician > administrative staff

TABLE IV
GENDER AND SUPERVISOR/MANAGER ON THE OVERALL SATISFACTION

Question	Variable	Mann-Whitney U Test	Exact Sig. (2-tailed)	Post Hoc
I am satisfied with working in this hospital	Gender	22729.5	0.013	M > F
	Supervisor /Manager	16951.0	< 0.001	Yes > No
I think I belong to this hospital	Gender	22686.5	0.013	M > F
	Supervisor /Manager	16358.0	< 0.001	Yes > No
I think I will continue to work in this hospital in the future	Gender	22450.5	0.008	M > F
	Supervisor /Manager	17181.0	0.001	Yes > No

Note: M and F in post hoc column represent male and female, respectively.

One-way analysis of variance with $\alpha = 0.05$ is used to evaluate if age, marital status, education, experience in organization, and job position have significant impacts on these three questions of the overall satisfaction in this case hospital statistically. Age plays an essential role to influence the overall satisfaction statistically. In general, employees who are 46-50 and 51 years or more tend to have higher satisfactions in these three questions. On the other hand, younger employees whose ages are 25 years and below and 26-30 years tend to have lower satisfactions in these three questions in general as shown in Table V.

Marital status influences "I think I belong to this hospital" and "I think I will continue to work in this hospital in the future", and medical staff who are married are more satisfied than those who are single statistically in Table V. Education affects the overall satisfaction significantly. Specifically, staff with master's degrees are more satisfied than those with university degrees in "I am satisfied with working in this hospital" and "I think I will continue to work in this hospital in the future." In addition, medical staff with master's degrees have a significantly higher satisfaction in "I think I will continue to work in this hospital in the future" than their counterparts with junior college degrees. In contrast, no differences have been found within the education for "I think I belong to this hospital."

Experience in organization is also an important variable to influence the overall satisfaction in Table V. Employees with less than 1-year experience in this hospital are more satisfied to work in this hospital than those with 1-3 years and 7-9 years statistically. Staff whose experiences are less than 1 year or 10 years or more have a higher satisfaction statistically than those whose experiences are 7-9 years in "I think I belong to this hospital." On the other hand, staff with 10 years or more have a significantly higher willingness to continue to work in this hospital in the future than those with 1-3 years. Finally, job position only affects "I am satisfied with working in this hospital." Physicians have higher satisfactions statistically than nurses and administrative staff.

Based on the findings in Table V, age is the most essential variable to affect the overall satisfaction in this case hospital followed by experience in organization. In contrast, job position might be the least important variable to influence the overall satisfaction.

V. DISCUSSION

Table VI summarizes the relationship between each demographic variable and each dimension of the employee satisfaction scale. By observing the demographic variables, experience in organization is the most critical variable to influence five out of seven dimensions followed by supervisor/manager and job position which impact four of seven dimensions. In contrast, marital status is the least important variable which only influences work itself. In general, employees who have less than 1-year experience are more satisfied in salary and benefits, promotion and appraisal system, colleagues, supervisors, and work itself as well as the overall satisfaction in "I am satisfied with working in this hospital" and "I think I belong to this hospital" indicating they have less complaints about the system and the overall environment the hospital provides compared with others.

TABLE V
ANOVA RESULTS ON THE OVERALL SATISFACTION

Dimension	Variable	F	Sig.	Post Hoc
I am satisfied with working in this hospital	Age	4.923	< 0.001	46-50 years > 26-30 years; 46-50 years > 31-35 years; 46-50 years > 36-40 years; 51 years or more > 26-30 years; 51 years or more > 31-35 years; 51 years or more > 36-40 years
	Marital status	0.919	0.431	
	Education	3.371	0.005	master's degree > university degree
	Experience in organization	4.158	0.003	less than 1 year > 1-3 years; less than 1 year > 7-9 years
	Job position	3.127	0.025	physician > nurse; physician > administrative staff
I think I belong to this hospital	Age	7.949	< 0.001	46-50 years > 25 years and below; 46-50 years > 26-30 years; 46-50 years > 31-35 years; 46-50 years > 36-40 years; 51 years or more > 25 years and below; 51 years or more > 26-30 years; 51 years or more > 31-35 years; 51 years or more > 36-40 years
	Marital status	3.561	0.014	married > single
	Education	2.379	0.038	None
	Experience in organization	3.954	0.004	less than 1 year > 7-9 years; 10 years or more > 7-9 years
	Job position	1.690	0.168	
I think I will continue to work in this hospital in the future	Age	12.27	< 0.001	36-40 years > 25 years and below; 41-45 years > 25 years and below; 41-45 years > 26-30 years; 46-50 years > 25 years and below; 46-50 years > 26-30 years; 46-50 years > 31-35 years; 51 years or more > 25 years and below; 51 years or more > 26-30 years; 51 years or more > 31-35 years; 51 years or more > 36-40 years
	Marital status	9.677	< 0.001	married > single
	Education	4.842	< 0.001	master's degree > junior college degree; master's degree > university degree
	Experience in organization	3.708	0.005	10 years or more > 1-3 years
	Job position	2.060	0.104	

TABLE VI
A SUMMARY OF DEMOGRAPHIC VARIABLES AND DIMENSIONS OF THE EMPLOYEE SATISFACTION SCALE

Variable	Salary and benefits	Employee education training and development	Promotion and appraisal system	Colleagues	Supervisors	Employee autonomy and empowerment	Work itself
Gender				*	*		*
Age	*		*				*
Marital status							*
Education	*			*		*	
Experience in organization	*		*	*	*		*
Supervisor/manager			*		*	*	*
Job position	*		*	*			*

On the other hand, work itself is affected by six out of seven demographic variables except for marital status. Obviously, work itself is the most essential dimension to be influenced by demographic variables. Work itself can be viewed as employees' emotional experiences developed from the work or work experiences according to their personal evaluation. However, the post hoc analyses do not show (many) differences within the demographic variables in age, education, experience in organization, and job position. More observations on how work itself is related to demographic variables are recommended for hospital management. In addition to work itself, salary and benefits, promotion and appraisal system, and colleagues are influenced by four of seven demographic variables. It is interesting to note that employee education training and development is the only dimension that has not been affected by any demographic variable.

VI. CONCLUSION

This study analyzes medical staffs' job satisfaction through Mann-Whitney U test and one-way analysis of variance from a regional teaching hospital in Taiwan. The case hospital developed its employee satisfaction scale through a rigorous research and uses this scale to evaluate employees' job satisfaction since 2014. There is a need to know if medical staff with different demographic variables perceive their job satisfaction differently. This study identifies experience in organization is the most essential variable to influence job satisfaction followed by supervisor/manager and job position. In contrast, marital status is the least important variables among all of the demographic variables. It is worth to note that employees whose experiences are 7-9 years have the lowest satisfaction in salary and benefits statistically. Therefore, hospital management needs to know why and how employees with 7-9 years are not satisfied with salary and benefits.

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