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Exploration on the Work Stress of Coding Specialists from the Promotion of New Medical Policies

Yu Hua Yan*

Department of Medical Research, Tainan Municipal Hospital, Taiwan

Abstract

Objectives: The purpose of the present study is to explore the influence from the promotion on the new health policy on the work stress of the coding specialists.

Methods: The present study mail or hand out questionnaire survey to be completed by the coding specialists throughout the nation; the surveys were collected for statistics, analyses and discussion. 802 surveys were distributed within the two months, and a total of 333 surveys were valid after invalid surveys were removed, the response rate was 41.5%.

Results: Most of the coding specialists in Taiwan are females between the age of 34 to 50 years old; most are college educated with over 10 years of service. Most spent 6 to 8 hours coding each day, and finish coding for each medical record in 20 minutes. No significant main effect was observed in gender and age on competency characteristics and work stress. The length of service and level of education can influence how much the knowledge, skills and learning aspiration one holds, as well as significant influence on role stress, interpersonal relationship, professional knowledge and workload.

Conclusions: Coding specialists are facing challenges in professional knowledge and stress from role transition. Recommendations are made to the government to provide different levels of training and to allocate additional training facilities aimed at the needs of those at different competence, and to value the professional value of the coding specialists to increase their enthusiasm and enhance their professional quality.

Keywords: ICD-10-CM/PCS; Knowledge; Work stress

Introduction

The use of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) for National Health Insurance Claims in Taiwan has been implemented for many years, and has assumed an important place. The ICD-9-CM was adopted in the 1970's so it's structure become outdated with the updated medical technologies and new etiology [1]. In terms of policies, it is unable to bridge with the international community; medical studies and assessment were hindered, making it difficult to assess new processes and the results of new healthcare. In terms of medical costs, the medical services are unable to be paid appropriately due to limitations in coding [2,3]. To connect with the international community, training, development and the establishment of the International Statistical Classification of Disease and Related Health Problems, Tenth Revision, Clinical Modification/Procedure Coding System (ICD-10-CM/PCS), was gradually introduced in 2011 in Taiwan, and the ICD-10-CM is scheduled to be fully implemented by 2014 [4,5].

The ICD-9-CM was being widely used officially since January 1, 1979. To reflect progress in relevant knowledge and changes in concept, international classification of disease is revised approximately every 10 years. However, the time between the 9th Edition (1975) to the 10th (1992) was about 17 years [6,7]. Taiwan started state-run health insurance in 1995. To establish medical cost auditing and payment standards, the ICD-9-CM was gradually introduced to claim for medical insurance claims using the codes for disease classification. Therefore, the ICD-9-CM plays a very important role in the National Health Insurance claims.

Over time, however, the ICD-9-CM code sets have become archaic in identifying clinical care patterns, and they lack the granularity needed to practice evidence-based medicine [8-10]. With advances in medical technology and the expansion of medical procedures, the level of specificity desired in diagnostic and procedural codes is growing [8,11]. The change to ICD-10-CM/PCS presents an opportunity for US providers, healthcare organizations, and payers not only to expand the ways in which medical procedures are documented for billing purposes but also to enhance the specificity at which patient-level data may be utilized to improve patient health outcomes, reduce medical errors, enhance quality data reporting, and increase the accuracy of claims payments [8,10,12,13].

ICD-10-CM differs from ICD-9-CM in its organization and structure, code composition, and level of detail. The major differences between the ICD-10-CM and ICD-9-CM coding systems are: (1) the tabular list in ICD-10 has 21 categories of disease compared with 19 categories in ICD-9-CM and the category of diseases of the nervous system and sense organs in ICD-9-CM is divided into three categories in ICD-10-CM, including diseases of the nervous system, diseases of the eye and adnexa, and diseases of the ear and mastoid process; and (2) the codes in ICD-10-CM are alphanumeric while codes in ICD-9-CM are numeric. Each code in ICD-10-CM starts with a letter (i.e., A-Z), followed by two numeric digits, a decimal, and a digit (e.g., acute bronchiolitis due to respiratory syncytial virus is J21.0). In contrast, codes in ICD-9-CM begin with three digit numbers (i.e., 001-999), that are followed by a decimal and up to two digits (e.g., acute bronchiolitis due to respiratory syncytial virus is 466.11) [10,14,15].

***Corresponding author:** Yan YH, Associate Professor, Department of Medical Research, Tainan Municipal Hospital, Yu-Hua Yan, No.670, Chongde Rd., East Dist., Tainan City 701, Taiwan (R.O.C.), Tel. +886 6 260 9926; E-mail: anne@mail.tmh.org.tw

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Many experiences from the United States were borrowed for the development of entire medical system in Taiwan, including the promotion of the Diagnosis-related group (DRG), ICD-10-CM, and like. Since its introduction in the 1979, the United States has been using the ICD-9-CM for 30 years. Beginning Oct. 1, 2013, clinicians will be required to use the new ICD-10-CM system, which will replace the current ICD-9-CM [16,17]. ICD-10-CM is already being used in a number of countries, including the United Kingdom, France, Germany, Australia and Canada. Developers of ICD-10-CM/PCS believe that this coding system allows providers to report clinical information with greater specificity, which will assist in public health surveillance and an increased ability to measure health care services [18].

Clinical education culture in Taiwan is different from other countries. Attending physicians in Taiwan do not write medical charts themselves, as it is done by the interns or resident physicians. The attending physicians only conduct final checking on the quality of the writing in the medical chart [19]. As a result, specialists play a very important role and their skills have to be proficient in the management of medical records [20]. The accuracy and the integrity of the classification of disease will influence the correctness of medical research, health insurance claims, and data for health statistics, which further affect drafting of health policies and plans. Therefore, over time, the professional resources and trainings of the coding specialists have to be relieved upon in order to achieve the accuracy and the integrity of disease classification [3,21-33]. This study compared the investigate impact of the competencies and the work stress of the coding specialists on the effectiveness of transition to the new ICD-10-CM/PCS.

Coding specialists in Taiwan began cooperating with the promotion of the health policy in 2011, and relearned the coding skills for the ICD-10-CM/PCS while using the ICD-9-CM disease classification at the same time for current health insurance system were used during the learning process. Throughout the ICD-10-CM/PCS transformation and learning process, the competency characteristics such as knowledge, competency, skills, learning aspiration of the coding specialists on their work stress such as individual roles, interpersonal relationships, professional pressure, and workload [34-37], may affect the effectiveness of the introduction of the ICD-10-CM/PCS. Therefore, exploring the promotion for new health policy to the work stress of the coding specialists is important and necessary, and is an important research topic for current medical management. The contribution from the present study is to establish the model for competency characteristic and work stress, in order to fill the current gap in the theory from lack of relevant literature.

Methods

Study designs

The present study uses a self-administered questionnaire for data collection. Relevant domestic literatures were referred for the research tools, and the characteristic of the subjects were considered when constructing the draft for the structured questionnaire. The draft for the survey was then tested for specialist validity, pre-test, reliability and validity analysis, and was approved by the IRB before the formal survey was completed. A total of 47 questions were included in the survey that included two sections for basic information and questionnaire.

1. Basic information on the coding specialists: Including gender, age, education level, years of service, time spent each day for coding, and the time needed to code each medical record.

2. 2. Questionnaire: In order to clarify the theoretical constructs and variables adopted in this study, we list three main constructs is shown in Figure 1. "Conceptual framework," summarizes the relationships proposed here among personal attributes, competency characteristics and work stress within coding specialists. Competency characteristics of the coding specialists (including, knowledge, competency, skills, learning aspiration) and work stress (including role stress, interpersonal relationship, professional stress and workload). The Likert 5-point scale was used for data measurement standard. Answers include "strongly agree," "agree," "neither agree nor disagree," "disagree," and "strongly disagree," which the respondent answer each question based on their degree of agreement (Figure 1).

Methodological quality

The survey establishment for the present study was constructed using expert validity. Experienced coding specialists and medical management experts (including 3 coding specialists, 2 medical management director, and 1 professional scholar) were invited for expert validity when the draft of the survey was completed. Relevance and clarity of the contents in the survey was reviewed; a CVI (the index of content validity) above 85% was the standard for the assessment, with the revision by the recommendations and the comments of the experts, the CVI value was 93%.

The pre-test survey was confirmed after the study was ascertained by expert validity. 30 coding specialists were enrolled during the first stage of this study for pilot testing from June 1, 2011, to June 20, 2011; in terms of reliability, test-retest reliability was completed two months afterwards. The test-retest reliability were: competency characteristic scale intraclass classification coefficient (ICC)=0.84, work stress scale ICC=0.92; data from 333 respondents showed that the ICC for each scale were: competency characteristics scale ICC=0.93, work stress scale ICC=0.95, respectively. Approval from each institution was obtained through official letter before the survey was conducted; the purpose was to revise measuring tools of the questionnaire. The study was sent to Buddhist Tzu Chi General Hospital for the review and approval by the Research Ethics Committee (Protocol Number: IRB100-69), before the second stage of the study was started.

Analytic approach

The purpose of the present study is to explore the influence from the promotion on the new health policy on the work stress of the coding specialists in Taiwan using questionnaires that were either mailed or handed out to the coding specialists nationwide; the

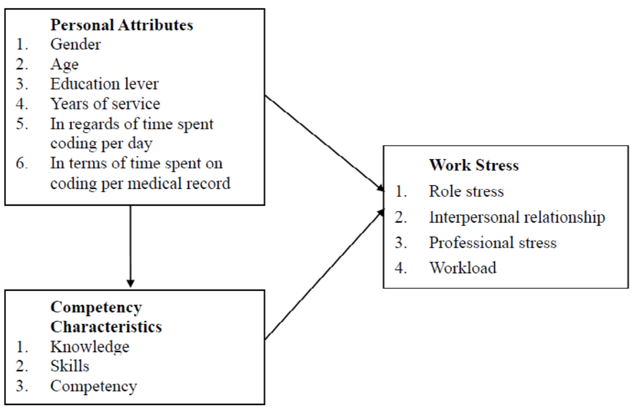

Figure 1: Conceptual framework.

survey were collected after it was completed for statistics, analysis and discussion. The study was conducted between August 1, 2011, and September 30, 2011. 802 surveys were distributed within the two months, and a total of 802 questionnaires were sent out, and 12 invalid questionnaires were removed, 333 questionnaires eventually sere used in the empirical analysis, which gives an effective response rate of 41.5%. After data collection was completed, SPSS for Windows 18.0 statistics software was used to perform statistical analysis. Considering the levels of measurement of the study variables and the applicability of the statistical analytic tools, we began with descriptive statistics to understand the data distribution. Further, multiple regression analysis was used to explore the prediction performance of the independent variable upon the dependent variable and relevant data, using <0.05 as the standard to determine statistical significance.

Results

Study characteristics

Demographic information of respondents for the 333 coders in this study are shown in Table 1. There are 324 females (97.3%), which is more than the 9 males (2.7%) in the samples of the present study. In terms of age, 155 subjects (46.5%) were 31-40 years old, which was the largest group, followed by 107 subjects (32.1) with 41-50 years old, 29 subjects (8.7%) were >50 years old, and 42 subjects (12.6%) were <30 years old. In regards to education level, 225 subjects (67.6%) had a bachelor's degree, which was the largest group, followed by 81 subjects (24.3%) with an associate's degree, 18 subjects (5.4%) had a graduate degree, and 9 subjects (2.7%) had a high school diploma, which was the smallest group. In terms of years of service within the institution, 152 subjects (45.6%) had >10 years of service, which was the largest group, followed by 105 subjects (31.5%) with 4-10 years, 40 subjects (12%) with 1-3 years, and 36 subjects (10.8%) had < 1 year. In regards of time spent coding per day, 189 subjects (56.8%) spent 6-8 hours a day coding, which is the largest group, followed by 77 subjects (23.1%) with <6 hours, and 67 subjects (20.1%) with >8 hours. In terms of time spent on coding per medical record, 196 subjects (58.9%) spent 11-20 minutes, which is the largest group, followed by 110 subjects (33%) with <10 minutes, and only 27 subjects require >20 minutes for coding (Table 1).

No significant difference in terms of gender and time spent coding per medical record was observed among hospital with different levels. However, in terms of education level, coding specialists in the medical centers have at least a associate degree with most number of specialists holding a graduate degree. In terms of years of service, the majority in the medical centers had >10 years of service, while most in the regional and local hospitals have more than 4 years of service. As for time spent coding per day, most in the medical centers and regional hospitals spent 6-8 hours, while those in the local hospitals spent <6 hours; a significance was observed (p<0.01).

Pearson product-moment correlation coefficient analysis was performed on each of the four perspectives in "competence characteristic" and "work stress" in the present study. The result showed significant correlation between the two scales (Table 2). From the perspective of competence characteristic, "knowledge," "skills," "competency," and "learning aspiration," a significance in the correlation (p<0.05) was observed between work stress; must were negatively correlated, indicating less work stress with higher competence characteristics. No significance (p>0.05) was observed in

Characteristic	Full Sample		Medical center		Regional hospital		Community hospital		*P*
	n=333	%	n=95		n=206	%	n=32	%	
Gender									
Female	324	97.3	89	93.7	203	98.5	32	100	0.033*
Male	9	2.7	6	6.3	3	1.5	0	0	
Age (years)									
<30	42	12.6	9	9.5	31	15.0	2	6.3	0.088
31-40	155	46.5	35	36.8	104	50.5	16	50.0	
41-50	107	32.1	38	40.0	58	28.2	11	34.4	
>51	29	8.7	13	13.7	13	6.3	3	9.4	
Education lever									
High school diploma	9	2.7	0	0.0	6	2.9	3	9.4	0.000***
Associate's degree	81	24.3	17	17.9	52	25.2	12	37.5	
Bachelor's degree	225	67.6	65	68.4	143	69.4	17	53.1	
Graduate degree	18	5.4	13	13.7	5	2.4	0	0.0	
Years of Service									
<1	36	10.8	9	9.5	26	12.6	1	3.1	0.000***
1-3	40	12.0	10	10.5	26	12.6	4	12.5	
4-10	105	31.5	16	16.8	80	38.8	9	28.1	
>10	152	45.6	60	63.2	74	35.9	18	56.3	
In regards of time spent coding per day									
<5	77	23.1	15	15.8	41	19.9	21	65.6	0.000***
6-8	189	56.8	51	53.7	128	62.1	10	31.3	
>8	67	20.1	29	30.5	37	18.0	1	3.1	
In terms of time spent on coding per medical record									
<10	110	33.0	36	37.9	62	30.1	12	37.5	0.541
11-20	196	58.9	53	55.8	124	60.2	19	59.4	
>21	27	8.1	6	6.3	20	8.7	1	3.1	
Note:**p*<0.05;***p*<0.01;****p*<0.001									

Table 1: Demographic information of respondents (N=333).

Measure	A1	A2	A3	A4	B1	B2	B3	B4
A1.Knowledge	1							
A2.Skills	0.358**	1						
A3.Competency	0.475**	0.494**	1					
A4.Learning	0.242**	0.496**	0.338**	1				
B1.Role stress	-0.401**	-0.340**	-0.457**	-0.366**	1			
B2.Interpersonal relationship	-0.226**	-0.302**	-0.350**	-0.373**	0.609**	1		
B3.Professional stress	-0.180**	0.038	-0.117*	0.055	0.459**	0.291**	1	
B4.Workload	-0.254**	-0.284**	-0.343**	-0.289**	0.564**	0.514**	0.290**	1
Note:*p<0.05;**p<0.01;***p<0.001								

Table 2: Variable correlation coefficient matrix.

Variable	A1		A2		A3		A4	
	F value	*P* value	F value	*P* value	F value	*P* value	F value	*P* value
Controlled Variable								
Gender	0.073		2.871	*	0.281		0.004	
Age	2.211	*	1.260		1.970		5.782	**
Education lever	1.652		0.651		0.467		2.785	*
Years of Service	3.189	**	2.177	*	2.778	**	1.783	
In regards of time spent coding per day	0.266		2.131		1.417		0.848	
In terms of time spent on coding per medical record	1.121		0.294		2.524	*	0.700	
Note:*p<0.05;**p<0.01;***p<0.001								

Table 3: ANOVA on Personal Attributes and Competency Characteristics.

Variable	B1		B2		B3		B4	
	F value	*P* value	F value	*P* value	F value	*P* value	F value	*P* value
Controlled Variable								
Gender	0.004		0.332		0.141		0.007	
Age	0.257		1.491		0.693		1.707	
Education lever	0.997		0.649		1.254		0.861	
Years of Service	1.052		1.306		2.128	*	1.627	
In regards of time spent coding per day	4.423	**	8.480	***	1.282		11.57	***
In terms of time spent on coding per medical record	0.988		1.352		0.405		3.404	**
Note:*p<0.05;**p<0.01;***p<0.001								

Table 4: ANOVA on Personal Attributes and Work Stress.

skills, learning aspiration and professional stress.

Analysis on personal attributes, competency characteristics and work stress

One-Way ANOVA was used to determine the difference in each perspective of age and years of service in terms of different conditions such as gender, age, years of service, time spent on coding per day, and time spent coding. The results of the analysis on each perspective of competency characteristics showed that the differences in "knowledge" were age and years of service, in that of "skills" were gender and years of service, in that of "competency" were years of service and time spent coding, and in terms of "learning aspiration" was age and level of education (Table 3). The results of the analysis on each perspective of work stress showed that the differences in "role stress" and "interpersonal relationship" were daily working hours for coding, in that of "professional stress" was years of service, and in that of "workload" were daily working hours for coding and time spent for coding (Table 4). Therefore, personal attributes have different extensive influences on the coding specialists' competency characteristics and work stress.

The residual analysis diagram of this study unraveled that each regression model did not violate the linear and homogeneity hypotheses. With respect to the colinearity issue, although the variable correlation coefficient matrix in Table 2 showed that independent variable dimensions were highly correlated with statistical significance (p<0.05), the Variable Inflation Factor (VIF) was used in this study to test if any serious multicolinearity was present among variables in order to prevent high colinearity existing among variables resulting in the failure to reach the most effective regression model [38]. If VIF is greater than 10, the colinearity of this model is classified as significant. The colinearity testing showed that the VIF value of each variable was 1-2 and there was no significant colinearity in this regression model, reaching an efficient configuration. As a result, this study was able to perform regression analysis.

Multiple regression analysis was conducted to test the statistics in order to search and to confirm the variables that are more influential than competency characteristic and work stress on the coding specialists, and its actual explanation and predictive capability. Basic information variables, competency characteristics and work stress of the coding specialists from each perspective were plotted in the regression model for analysis; those that are categorical variables were entered into the analysis after transferred as dummy variables. The results showed that the VIF of each independent variable was between 1.179 and 3.981, less than 10, indicating that there are no collinearity among the independent variables in the regression analysis model in the present study. The DW test value was 1.845, close to 2, indicating that the residual value of this model does not violate the self-related basic hypothesis. The present study transfers the categorical variables such as the personal information of the subjects into dummy variables; and variables such as "female," "age=30-40," "education=university," and "years of service >10" as reference groups.

In terms of coding specialists' personal attribute, the results of the regression analysis as shown in Table 5 showed that negative regression coefficient for years of service <1 and 4-10 with regards to role stress, with a negative correlation (β=-0.099, -0.101), while knowledge (β=-0.230), competency (β=-0.278), and learning aspiration (β=-0.203), showed a significant negative correlation; the change in explanatory power was statistically significant (F value=10.322; p<0.01). With regards to interpersonal relationships, standardized regression coefficients for those with associate degree were negative, showing a significant negative correlation (β=-0.107); competency (β=-0.223) and learning aspiration (β=-0.255), and the change in explanatory power were statistically significant (F value=6.379; p<0.01). In terms of professional stress, the standardized regression coefficients for 1-3 years of service was positive, showing significant positive correlation (β=0.125); knowledge (β=-0.189), competency (β=0.189), learning aspiration (β=-0.121), and the change in explanatory power were statistically significant (F value=2.271; p<0.05). As for workload, a significant positive correlation was found between high school diploma (β=0.095); significant negative correlation was found in 4-10 years of service, knowledge (β=-0.123), competency (β=-0.212), and learning aspiration (β=-0.140); the change in explanatory power was statistically significant (F value=5.382; p<0.01). Therefore, no significant main effect was found between gender and age (β value did not achieve statistical significance). Knowledge, skills and learning aspiration were lower for those with years of service less than 1 year and 4-10 years when compared to those with >10 years, which lead to greater positive influence in role stress. The competency and learning aspiration for those with associate degree were lower, and a less likelihood of conflict in interpersonal relationships. The knowledge, skills and competency were lower for those with 1-3 years of service when compared to those with >10 years of service, which has more positive influence on professional stress. Since the knowledge gathered, competency and learning aspiration were lower, workload has more influence for those with a high school diploma.

Discussion

Although the subject on work stress has been commonly explored in various industries, studies on the influence caused by the promotion of new medical policies to the executing staffs using coding specialists as subjects are lacking. In addition, studies listing competency characteristic and work stress as focus of analysis were relatively fewer; therefore, the results from the present study posses important meanings in actual management. The results from the present study found that most coding specialists in Taiwan are females, between 34 and 50 of age, majority has a bachelor's degree, most has >10 years of service, overall spent 6-8 hours per day on coding, with the most of the specialists finishing coding each medical record within 20 minutes. The disease complexity and severity of the patients in the medical centers are higher than that from the regional and local hospitals. The result also showed the number of coding specialists spending >8 hours for coding per day in medical centers is higher than those in other levels of hospitals.

Coding specialists are generally lacking in hospitals in Taiwan. Relevant systems in Taiwan require testing in anatomy, physiology, epidemiology, pathology, health statistics, general theory in health information management, rules of disease classification, medical terms, and disease classification coding system, to obtain certificate

Variable	B1		B2		B3		B4	
	B value	*P* value	B value	*P* value	B value	*P* value	B value	*P* value
Controlled Variable								
Gender(Males vs. Females)	0.000		-0.011		0.004		0.018	
Age (Reference group:31-40)								
<30	-0.015		-0.067		-0.050		-0.034	
41-50	-0.084		-0.009		0.060		0.034	
>51	-0.029		0.037		0.015		0.022	
Education lever(Reference group: Bachelor's degree)								
High school diploma	-0.012		-0.057		-0.054		0.095	*
Associate's degree	-0.017		-0.107	**	-0.068		0.005	
Graduate degree	-0.051		-0.007		-0.078		-0.003	
Years of Service(Reference group: >10)								
<1	-0.099	*	-0.046		-0.055		-0.036	
1-3	-0.024		0.036		0.125	*	0.045	
4-10	-0.101	*	-0.016		0.025		-.0108	*
Competence characteristic								
Knowledge	-0.230	***	-0.054		-0.189	**	-0.123	**
Skills	-0.017		-0.044		0.118	*	-0.074	
Competency	-0.278	***	-0.223	***	-0.121	*	-0.212	***
Learning	-0.203	***	-0.255	***	0.100		-0.140	**
Test of Model Explanatory Power								
R^2	0.312		0.219		0.091		0.192	
Adj. R^2	0.282		0.185		0.51		0.156	
F Test	10.322***		6.379***		2.271**		5.382***	
Note:*p<0.05;**p<0.01;***p<0.001								

Table 5: Regression analysis on Personal Attributes, Competency Characteristics and Work Stress.

of approval in disease classification. Only 800 or so persons have obtained the certificate so far. The training of a coding specialist cannot be achieved overnight. Therefore, the promotion of the ICD-10-CM/PCS will create a certain level of impact on work stress to these coding specialists. Since hospitals are non-profit organizations and a labour-intensive industry, a large number of medical, technical and administrative staffs are required for normal operation. Therefore, competency characteristics of the staffs have become a very important link in the success of promoting health policy [39]. The link between knowledge, skills, competency, learning aspiration and work stress on job, are the key behavioural elements to predict if the promotion of the new health policy is successful or not.

No influence in terms of personal attribute and competency characteristics was observed in work stress, gender and age; this is different from the study by Misra et al [40-41]. In the aspect of "role stress" and "professional knowledge" on the difference between work stress and competency characteristics of the coding specialists, the present study found that coding specialists with lower years of service would have fewer competency characteristic, and its role stress are higher. Coding specialists are key persons in the promotion of new health policy that requires a wide range of professional knowledge and skills [42]. Coding specialists play multiple roles; role stress such as role conflict and inadequacy are inevitable. Therefore, coding specialists with fewer years of experience will feel the challenges of professional knowledge and role transformation more directly.

In addition, the present study also found that work stress from "interpersonal relationships" can cause influence on the coding specialists. However, the study by Chen et al., [41] pointed out that scoring for "interpersonal relationship" as the source of stress in stress perception of hospital health care executives received the lowest score. An exploration on the cause found that the subjects in the present study were coding specialists, while those in Chen were departmental executives in the hospitals. The practical experiences, work contents, and promotion requirements between the two were different, may be the cause for the difference between the two results; which may influence the perception of the work stress from interpersonal relationship in coding specialist. The present study also found that coding specialists of more age and years of service have more experiences and better coping skills with others, and a less perception of work stress.

In the four aspects on the source of work stress, the majority of the work stress for the coding specialists originates from "workload." Most coding specialists are unable to complete tasks within a specific timeframe due to an increase in the amount of work, causing a high workload. Using healthcare managers as subjects, the study by Shirey et al., [43-44] found that healthcare managers have to work 12-14 hours each day; there is not enough time to complete the tasks that should be done for the job in a day, which is consistent with this study. On the other hand, the results from the exploration of work stress and coping methods in directors of the elementary schools by Chuan and Lu [45], and the study by Chen et al. [41], have shown that the major source of work stress are from workload, which is identical to the result of this study. Although the study subjects are different, the result showed that the major source of work stress for coding specialists is workload.

Conclusions

The present study has discovered the source of work stress in coding specialists; the following recommendations are made. (1) In the respect to education: Study results found that coding specialists with lower education level than an associate degree have the highest work stress. Therefore, when conducting the ICD-10-CM/PCS training, the government should assist in providing additional studying opportunities to enhance problem solving capability in order to reduce work stress. Furthermore, the results from the present study showed that coding specialists with lower years of experience and competency characteristics shows a positive correlation with "work stress." This indicates that the coding specialists may facing the challenges in professional knowledge and pressure in role transformation. Although the government is continuing to hold training courses for the coding specialists, most were integrated or general courses. Therefore, recommendation is made to the government to respect the professional value of the coding specialists by providing good educational training and wider distributed training site based on the needs of specialists with different qualifications. Give appropriate rewards for auditing, adjusting codes, obtaining certificates actively to the disease classification staffs, in order to encourage enthusiasm and elevate professional quality. (2) In terms of practical aspect, the scoring for the source of work stress for coding specialists with lower years of service is higher. Therefore, hospitals should retain experienced coding specialists; promotion for those with enough experience will help facilitate organizational development. (3) In terms of policy, human resources for coding specialists in hospitals with different levels should be considered in various aspects, including cooperation with the execution of relevant governmental policies, requirements for hospital accreditations, and etc., as the allocation of human resources can reduce workload for the coding specialists.

Limitations

The present study is a cross-sectional study. The results can only represent the exploration on the work stress to the coding specialists from the hospitals on the promotion of new health policy in a certain period of time. Recommendation is made to expand the sample size to the promotion of healthcare policies in future studies, so that the data in the cross-section is more complete, and that the results obtained would be more representative. Overall, there is still room for discussion in regards to the issues on the promotion of new medical policies for future study. We hope that this study brings different thinking to the problem and to provide wider direction for research.

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