ORIGINAL ARTICLE

THE EVALUATION OF KNOWLEDGE AND PRACTICE ON CLINICAL PATHWAYS AMONG HEALTH CARE WORKERS AT UNIVERSITI KEBANGSAAN MALAYSIA MEDICAL CENTRE (UKMMC) MALAYSIA

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ABSTRACT

The rapid development in the health sector has spurred many healthcare organizations to improve their productivity and quality, particularly in terms of service. Clinical Pathways was introduced with the objective of improving the quality of care and services in health; while at the same time eyeing the possibility of reducing the medical expenses. It can be defined as a document based tool that links the best available evidence and clinical practice and provides recommendations, the process and time frame for the clinical management of healthcare. A cross sectional study was carried out at University Kebangsaan Malaysia Medical Centre (UKMMC) Malaysia with the aim to evaluate the level of knowledge about Clinical Pathways (CP) and to ascertain its level of practice in the implementation of CP among healthcare workers at UKMMC; and to establish correlated determinant factors. The study involved a total of 127 respondents; majority of whom were female (77.2%), aged between 32 and 45 years (51.2%), working as nurses (71.7%), and having working experience of six years or longer (52.0%) at UKMMC. The findings reveal that 52.8% of respondents agreed that there is a proper implementation of the Clinical Pathways (CP) programme at UKMMC; and that 52.0% of the respondents have a higher level of knowledge about CP and 70.1% of them practiced it well. The findings also unravel two factors (position and working experience) as the predictors of respondents' level of knowledge about CP, and position as a predictor representing the practice of it at UKMMC. It can be safely surmised that most of the respondents have a higher level of knowledge about Clinical Pathways and that they practice it well in their daily task as healthcare workers.

Keywords: Knowledge, Practice, Clinical Pathways

INTRODUCTION

The rapid development in the health sector has spurred many healthcare organizations to improve their productivity and quality, particularly in terms of service. In the midst of it all, Clinical Flow Chart was introduced with the objective of improving the quality of care and services in health; while at the same time eyeing the possibility of reducing the medical expenses. Changes in healthcare trends and case management have replaced the traditional Clinical Practice Guidelines (CPG) evolving into Clinical Pathways with the aim to provide an effective and efficient care for patients within certain health problems1.

Clinical Pathways can be defined as a document based tool that links the best available evidence and clinical practice. It provides recommendations, the process and time frame for the clinical management of health in certain medical intervention or conditions2. To cite Tomoyashi (2011)3, Clinical Pathways is an organized instrument that leads towards optimal patient care. The development of Clinical Pathways involved all the healthcare workers including doctors, nurses, physiotherapists, social workers and others. Used properly, CP helps to give consistent diagnosis and treatment, and provides visual assumption of the patient's care or treatment.

In agreement, Bryan et. al (2002)4 described Clinical Pathways as a map that involves general management of clinical situation – explaining specifically what to do, when to do it, by whom the action needs to be taken, and where it should be done. As a result, Clinical Pathways metamorphosed into two trajectories – a succession of care by staff time and delivery of care as experienced by patients. More often than not, Clinical Pathways is developed by a multidisciplinary team cutting across the care packages.

The goal of implementing Clinical Pathways is primarily to use a reliable clinical approach that clearly focuses on an expected outcome of patient care based on reducing the admission time that subsequently reduces the cost of patient care. On this score, healthcare workers have been challenged to consider the key elements in Clinical Pathways – explain the normality, identify the difference, establish the difference in terms of diagnosis, handling individual responses to care,

management in continuity, communication among team members, the dilemma of chronic diseases, and developing the clinical model at the same time1.

Clinical Pathways has been introduced in many hospitals worldwide and it has been accepted as a beneficial tool in helping healthcare organizations. It has been proven that CP is able to provide continuous high quality services and coordinate healthcare services at a lower cost. Since Clinical Pathways proved to be a useful tool in other countries, it has been introduced albeit recently in the health care system in Malaysia5. However, surprisingly, only a few healthcare organizations in Malaysia have implemented Clinical Pathways in their organizations.

Based on a study by Cheah (2000)6, there was only a handful of studies published on Clinical Pathways, with most of them focusing and discussing on the effectiveness of Clinical Pathways. There were very little available published data on the variances, and how the use of variance information can improve the quality of care. Being said that, the trend indicates there is an increasing interest in the used of Clinical Pathways.

Since the implementation of the Clinical Pathways in 2009 at University Kebangsaan Malaysia Medical Centre (UKMMC), there was no evidence that a prior study has been carried out in trying to evaluate the level of knowledge about CP and its practice among health care workers at the medical centre. For this purpose, the study aims to determine the level of knowledge and the practice of CP among healthcare workers at UKMMC; while at the same time the study is able to look into the relationship between socio-demographic, socio-economy and organization factors.

METHODOLOGY

A cross sectional study was carried out at University Kebangsaan Malaysia Medical Centre (UKMMC) from July to December 2012. Three selected departments and 12 wards that use Clinical Pathways in delivering healthcare to the patients were involved. Minimum sample size for this study is 120 respondents based on the criteria set by Lwanga and Lemeshow (1991)[7] formula. Previous study used as a benchmarking example where from Paudyal et al (2008) study entitled The Evaluation of Knowledge, Attitude and Practise of Cross Infections Amongst General Practitioners in Nepal.

Based on universal sampling method, the researchers managed to acquire a total of 127 respondents for this study. The inclusion criteria are – Malaysians, doctors and nurses, working in departments or wards that use Clinical Pathways at UKMMC. The exclusion criteria cover those who were on maternity leave and those whose were engaged in the pre-test.

A set of self developed and administered questionnaire was used in collecting data for this research. A pre-test has been conducted to test the reliability of the questionnaire with Cronbach Alpha value of 0.7 and above. In this study, two sets of variables are selected as the dependent variable; i.e. Knowledge and Practice. Meanwhile, three other variables are selected as independent variables; namely socio-demographic, socio-economy and organization factors.

There is a set of 21 questions on the level of knowledge about CP with a total score of 45 marks. The minimum mark in this section is zero while the highest score is 45. The researchers used the median score of total respondents' marks to differentiate between the high and low levels of knowledge on CP. Based on the data analyzed; the median value for the 21 questions is a score of 26. Thus, respondents who score 26 and above are classified as having a high level of knowledge about CP while a score of 25 and below indicates a low level of knowledge on CP.

Correspondingly, there is a set of 15 questions on the practice of CP using 4 points Likert Scale with a total score of 60 points. The median score of the respondents is 36 marks, implying that respondents who score 35 points and below are categorized as having practiced Clinical Pathways "poorly" while 36 points and above scorers are categorized as having practiced CP "well".

In addition, there are five more questions for organization factors using 4 points Likert Scale with a total score of 20 points. The median score by the respondents for implementation and policy is 14 marks. Thus respondents who score 13 points and below are categorised as "do not agree" while scorers of 14 points and above are categorised as "agree". On the question for "full participation by organization", the median score by the respondents was 13 points, implying that respondents who score 12 points and below are categorised as "do not agree" while scorers of 13 and above are categorised as "agree".

Data was analyzed using Statistical Package for Social Science (SPSS) version 17.0. The statistical analysis for bivariate analysis was Chi Square while Logistic Regression was used for multivariate analysis.

RESULTS

A total number of 273 survey questionnaires were distributed based on all staffs in the selected departments and wards with the intention of getting a maximum number of respondents in this study. In spite of that, only 127 respondents completed and returned the questionnaires; and their inputs were subsequently used as data in this study. Given the number of respondents, the response rate for this survey was 46.5%. Although response rate was slightly low but the number achieved the minimal sample size needed.

As illustrated in Table 1, more than half of the respondents (52.0%) have a high level of knowledge about Clinical Pathways as compared to 48.0% who seem to have a low level of knowledge about it. Majority of the respondents (70.1%) practiced Clinical Pathways "well" as opposed to 29.9% of the respondents who practiced it "poorly".

Table 1: Knowledge and Practice Frequency

Variable	Frequency	Percentage (%)
Knowledge		
Low	61	48.0
High	66	52.0
Practice		
Less or poor	38	29.9
Good	89	70.1

As shown in Table 2, respondents' age ranged from 21 to 45 years old, with 48.8% of whom were from young age group (21 to 31 years) while the older age group (32 to 45 years) was slightly bigger with a percentage of 51.2%. Female respondents were more (77.2%) as compared to male (22.8%). Majority of the respondents were nurses (71.7%), comprising chief nurses (8.7%), staff nurses (60.6%) and nurse assistants (2.4%). The rests of the respondents were doctors (28.3%), comprising specialists (10.2%) and medical officers (18.1%). Most of the respondents have worked for six years or longer (52.0%) at UKMMC while 48.0% of them have worked less than five years at the same medical centre. There is a small difference between healthcare workers who "agree" (52.8%) that there is a proper implementation of Clinical Pathways based on sound policy by UKMMC, while others "do not agree" (47.2%). Finally, 52.8% of the respondents seem to "agree" that there was a full participation on Clinical Pathways by the organization while the rest "do not agree" (47.2%).

Relationship between knowledge and factors studied.

Table 3 shows the Chi-square test for the level of knowledge and the factors studied. The result indicates that there is a significant relationship between the level of knowledge and age, gender, position and working experience. The level of knowledge about Clinical Pathways is higher among older respondents (67.7%) as compared to the younger respondents (35.5%). Interestingly, the level of knowledge is higher among male respondents (69.0%) as compared to female (46.9%) healthcare workers. It is also found that doctors (83.3%) have higher level of knowledge about Clinical Pathways than nurses (39.6%). As expected, 69.7% respondents who have worked for six years or longer have higher level of knowledge about CP than those who have worked less than five years (32.8%) at UKMMC.

Table 2: Frequency of Studied Factors

Variable	Frequency	Percentage (%)
Socio-demographic factor		
Age (years)		
Young (21 – 31 years old)	62	48.8
Older (32 – 45 years old)	65	51.2
Gender		
Male	29	22.8
Female	98	77.2
Socio-economy factor		
Positions		
Medical Officer	23	18.1
Specialist	13	10.2
Chief Nurse	11	8.7
Staff Nurse	77	60.6
Assistant Nurse	3	2.4
Working Experience		
New (0 – 5 years)	61	48.0
Old (6 years and above)	66	52.0
Organizational factors		
Implementation and Policy		
Not agree	60	47.2
Agree	67	52.8
Full Participation by Organization		
Not agree	60	47.2
Agree	67	52.8

Table 3: Chi-Square between Knowledge and Studied Factors

Variables	Level of Knowledge on Clinical Pathways		x^2	P value
	Low (%)	High (%)		
Socio-demographic factor				
Age (years)				
Young (21 – 31 years old)	40 (64.5)	22 (35.5)	13.188	<0.001*
Older (32 – 45 years old)	21 (32.3)	44 (67.7)		
Gender				
Male	9 (31.0)	20 (69.0)	4.350	0.037*
Female	52 (53.1)	46 (46.9)		
Socio-economic factor				
Positions				
Doctors	6 (16.7)	30 (83.3)	19.801	<0.001*
Nurses	55 (60.4)	36 (39.6)		
Working Experience				
New (0 – 5 years)	41 (67.2)	20 (32.8)	17.302	<0.001*
Old (6 years and above)	20 (30.3)	46 (69.7)		
Organizational factors				
Implementation and Policy				
Not agree	30 (50.0)	30 (50.0)	0.177	0.674
Agree	31 (46.3)	36 (53.7)		
Full Participation by Organization				
Not agree	26 (43.3)	34 (56.7)	1.006	0.316
Agree	35 (52.2)	32 (47.8)		

Relationship between practice and factors studied.
As illustrated in Table 4, there are three factors that found to have significant relationship with practice; namely age, gender and position. Younger respondents (79.0%) seem to have practiced Clinical Pathways widely as compared to the older (61.5%) healthcare workers. Meanwhile, female (76.5%) healthcare workers seem to have wider practice of CP as compared to the male (48.3%) counterparts. The practice of Clinical Pathways is more visible among nurses (80.2%) as opposed to doctors (44.4%).

Table 4: Chi-Square between Practice and Studied Factors

Variables	Level of Practice on Clinical Pathways		x^2	P value
	Less or poor (%)	Good (%)		
Socio-demographic factor				
Age (years)				
Young (21 – 31 years old)	13 (21.0)	49 (79.0)	4.631	0.031*
Older (32 – 45 years old)	25 (38.5)	40 (61.5)		
Gender				
Male	15 (51.7)	14 (48.3)	8.520	0.004*
Female	23 (23.5)	75 (76.5)		
Socio-economic factor				
Positions				
Doctors	20 (55.6)	16 (44.4)	15.745	<0.001*
Nurses	18 (19.8)	73 (80.2)		
Working Experience				
New (0 – 5 years)	14 (23.0)	47 (77.0)	2.720	0.099
Old (6 years and above)	24 (36.4)	42 (63.6)		
Organizational factors				
Implementation and Policy				
Not agree	22 (36.7)	38 (63.3)	2.468	0.116
Agree	16 (23.9)	51 (76.1)		
Full Participation by Organization				
Not agree	16 (26.7)	44 (73.3)	0.575	0.448
Agree	22 (32.8)	45 (67.2)		

Multivariate analysis
Based on the multivariate analysis, it is found that only two factors that are significant as the predictors of respondents' knowledge about Clinical Pathways; i.e. positions and working experience. The Exponent B for position is 10.47, implying that the level of knowledge about Clinical Pathways among doctors is 10 times higher than the nurses. Meanwhile, the Exponent B for working experience is 0.23, which means that the level of knowledge for healthcare workers who have worked for six years or longer at UKMMC is 0.2 times higher than those who have five years or less working experience at the same medical centre. The Nagelkerke R square value for both factors is 0.29 which means that 29.0% of knowledge about Clinical Pathways is contributed from the two factors considered as the rest of the factors are not included in this study.

Further, only one factor is found to be significant as the predictor of Clinical Pathways practice; i.e. positions. The Nagelkerke R square value for this factor is 0.18, implying that 18.0% of Clinical Pathways practice is attributed by the positions as the rest of the factors are not explored in this study. Exponent B for position is 0.18, which means that the practice of Clinical Pathways among nurses is 0.18 times higher than the doctors.

Table 5: Logistic Regression for Knowledge and Studied Factors

Factors					95% confidence interval for B	
	B	S.E	Sig. Value	Exp (B)	Lower	Upper
Age	0.698	0.717	0.330	2.010	0.493	8.194
Gender	-0.617	0.840	0.462	0.539	0.104	2.795
Position	2.365	0.901	0.009*	10.649	1.821	62.270
Working Experience	-1.466	0.650	0.024*	0.231	0.065	0.825
Implementation and policy	-.446	0.427	0.296	0.640	0.277	1.478
Full participation by organization	0.232	0.421	0.582	1.261	0.552	2.880

DISCUSSION

Clinical Pathways has been accepted and used widely in healthcare the world over, but in Malaysia, its application is still in infancy in the country healthcare system. Results of this research reveal that there is a significant relationship between the level of knowledge about CP and age of the healthcare workers. The level of knowledge among older healthcare workers is higher as compared to younger healthcare workers. This may be due to the fact that older medical healthcare workers have been more exposed to the clinical pathways programme and that they may have gained indirect knowledge through attending courses, reading published and online journals from internet search; the activities of which may have made them having better knowledge about Clinical Pathways. These findings are in agreement with studies carried out by Priyamvadaet. al (2008)[8] The results of their studies reveal that the level of knowledge about infection control pathway is lower among younger healthcare workers as compared to older healthcare workers.

Of interest, this finding is not in agreement with studies undertaken by Ndeteiet. al (2011)[9] which reveal that the percentage of young doctors and nurses reportedly having better knowledge about the mental disorders pathway treatment is higher than older doctors and nurses.

This study reveals that there is a significant relationship between the practice of Clinical Pathways and the age of the respondents. Younger healthcare workers seem to have practiced Clinical Pathways "well" as opposed to the older healthcare workers. It could be due to the fact that younger healthcare workers are more open and receptive to new programmes and ideas and that they are still not hindered by fixed ways of performing their tasks. This observation is supported by Parker et. al (2005)[10] who discover that the experience of using Clinical Pathways is more positive among younger healthcare workers than those who are older as they – the older healthcare workers – assume that CP tends to make them lose control over clinical decisions while treating patients.

Table 6: Logistic Regression for Practice and Studied Factors.

Factors					95% confidence interval for B	
	B	S.E	Sig. Value	Exp (B)	Lower	Upper
Age	-0.324	0.810	0.689	0.723	0.148	3.537
Gender	-0.161	0.609	0.792	0.851	0.258	2.810
Position	-1.724	0.741	0.020*	0.178	0.042	0.763
Working Experience	0.067	0.688	0.923	1.069	0.278	4.114
Implementation and policy	-.345	0.434	0.426	0.708	0.303	1.656
Full participation by organization	0.395	0.444	0.374	1.484	0.621	3.546

Surprisingly, the study unravels a significant relationship that the level of knowledge is higher among male as opposed to female healthcare workers. This is an unexpected discovery by the researchers since information about Clinical Pathways is readily available from published texts, journals and internet search; and certainly it is not gender biased. Logically, with the boundless information online and seamless technology to support it now, the knowledge gap between

genders should cease to exist. However, the researchers would like to opine that male healthcare workers have a more pronounced desire than women in researching and acquiring knowledge about Clinical Pathways. The researchers stand corrected though. Perhaps a deeper research is called for to settle the issue.

The study further discovers that the level of usage or practice of Clinical Flowchart is higher among

women than men healthcare workers. This may be due to the nature of women who respond positively on new programmes or ideas, thus reducing the negative resistance to the use of Clinical Pathways. According to Wuletaw (2008)11, there are a number of conflicting arguments about the gender differences factors in knowledge and practice research. Among them are the views by Western society that men tend to have more negative critics and opposing views on the environment than women. Since women are more positive in receiving something in environment, they are more likely to adopt and use Clinical Pathways in their tasks as healthcare workers as opposed to men.

The study also indicates that there is a meaningful relationship between the level of knowledge and position. The level of knowledge is higher among doctors than nurses. However, this is in contrast to a study carried out by Sarah (2005)[12] who, using the same respondents, found that the level of knowledge of the patient's pain score was lower among doctors than nurses. This may be due to the fact that doctors have a higher level of qualification than nurses and they get early exposure through formal education from their universities. This view is supported by Churchman and Doherty (2010)13 who say that doctors have exclusive level of theoretical knowledge that lead them to have different levels of knowledge as compared to nurses.

However, the results of this study show that the practice of Clinical Pathways is more prevalent among nurses than doctors, and that it has a significant relationship. This may be due to the fact that, originally, the implementation of Clinical Pathways in UKMMC was pioneered by the nurses. The finding concurs with Currie and Harvey (1998)14 who found that nurses are the best professional groups to coordinate and facilitate the development, implementation, and evaluation of Clinical Pathways. It can be inferred then that nurses are more likely to adopt and apply Clinical Pathways in their daily tasks. Interestingly, Hindle (2004)15 states that a number of healthcare workers, especially doctors, are more likely to change their perspective in using Clinical Pathways as they tend to buckle due to outside pressure. There are a number of unknown factors that contribute to their reluctance of using Clinical Pathways, presumably due to the perception that they will lose some autonomy and control over clinical decision making. This view is well supported by Gibb and Banfield (1996)15 who state that there are significant concerns from doctors and nurses about the implementation of Clinical Pathways. They feel that the application of the Clinical Pathways has deviated from expert practice and it all seems contradictory in terms of the standard healthcare protocol that leads them to oppose its usage.

Finally, this study reveals that the level of knowledge is higher among healthcare workers who have working experience of six years or longer, as compared to those who have lesser years of working experience. This observation seems to have a significant relationship. The higher level of knowledge may be due to indirect exposure to Clinical Pathways through conferences and courses they could have attended; over and above to reading of literatures, journal and internet search even though CP was still not implemented at that time.

STUDY LIMITATION

This study is a cross sectional study; thus the validity of the findings obtained are confined to a specific time only. Due to the behaviour of the respondents often change over time; it may not reflect the real situation in a long term. Furthermore, low response rate might also inadvertently give a hint of bias to this study. The researchers have attempted a variety of approaches like face to face interviews, emails and letters to ensure the maximum number of samples for this study.

CONCLUSION

This study reveals that most of the healthcare workers at UKMMC have a high level of knowledge about Clinical Pathways. And this high level of knowledge is closely associated with position and working experience. The study also reveals that majority of healthcare workers at UKMMC practice Clinical Pathways "well" in their job. Again, the good practice of CP is closely associated with the position of the healthcare workers.

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