EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

EFFECTIVENESS OF KNOWLEDGE DATABASE ON PREVENTION AND HEALTH CARE

Yueh-Chin Chung, Ph. D[1]*

[1]Department of Nursing, Central Taiwan University of Science and Technology, Taichung, Taiwan.

*Corresponding Author: Dr. Yueh-Chin Chung

Department of Nursing, Central Taiwan University of Science and Technology, Taichung, Taiwan.

ABSTRACT

Background: Knowledge and know-how are the bases of modern national competitive advantage, such that becoming a better field professional requires the establishment of one's competitiveness, knowledge and expertise. At present, the research trend in Taiwan also considers longitudinal study as the feasible method for future research. Working closely with the international tide, expanding the integration of digital professional field and accumulating basic health knowledge can further promote the study on prevention and health care. Therefore, Internet companies are integrated into the digital learning platform to make study and discussion interactive in order to enhance research on prevention and health care, to strengthen the development of preventive health knowledge, and to cultivate the competitiveness of applied research. **Research Objectives:** This paper aims to discuss the concept of a 3-stage 5-level public health prevention and health care plan proposed by Leavell and Clark (1965) as a mode to establish a knowledge base for the information needs of the medical staff and to form the professional knowledge on prevention and health care know-how. **Research Method:** With the 3-stage 5-level public health prevention plan, this paper establishes the knowledge base in 7 steps: 1. research design; 2. data collection; 3. establishment of web architecture; 4. sorting out data; 5. analyzing data; 6. report writing; and 7. application and popularization. **Results:** The years 2008–2014 has the most number of people receiving prevention and health care services (well-baby care services, prenatal examination of pregnant women, Papanicolaou smear, and dental fluorosis in children, adult preventive care, quantitative immunochemical fecal occult blood examination, oral mucosa examination) in primary hospitals in Taipei. Over time, the number of people receiving prevention and health care services has increased. In 2014, the most number of people received mammography in regional and area hospitals. In 2009, the most number of children under one, one and a half, more than one and a half, 2–3 and 3–7 years old received well-baby care services in medical centers and primary hospitals. In 2014, the number of pregnant women aged 30–34 received their first prenatal examination in primary hospitals. In 2011, the most number of pregnant women aged 35–39 years received their first prenatal examination in primary hospitals. Of 45 students using web platforms with the established knowledge base of prevention and health care, the mean satisfaction is 4.33 (0.26). This system can be used as a reference for the application of the new knowledge base of prevention and health care in the future.

KEYWORDS: Prevention and health care,3-step 5-level public health prevention mode, Knowledge base.

INTRODUCTION

The progress and rapid development of information technology have been particularly important in the competitive environment. Using existing information for analysis and forecasting is one of the key factors in business. Therefore, the issue of using databases for knowledge discovery has attracted increased attention. Database application has become more popular in recent years. To maintain the business advantage, effective enhancement and management application are key to maintaining competitive advantages. Establishing a knowledge base can also maintain competitive advantage to conveniently and effectively collect market information.

The 1978 Alma-Ata 30th World Health Assembly resolution aimed to achieve the "Health for All" goal through primary health care services, that is, to ensure that people equally receive health care services.[1] In 1974, the minister of Welfare and Health of Canada, Lalonde, H. M., put forward four factors that affect health, namely, medical system, inheritance, environment and lifestyle.[2] A 1979 US Public Health Report showed that 50% of national mortality in 1976 was a result of unhealthy behavior or lifestyle.[3] Early examination and early treatment are the most common and effective measures to prevent disease and promote national health.[4-9]

According to the health statistics of the Ministry of Health and Welfare, since 1982, cancer is the top out of ten causes of death in Taiwan, linearly increasing every year.[5] In 2014, cancers of the trachea, bronchus and lung are the most common types of malignant tumors among Taiwanese women; cancers in the colon, rectum and anal orifice are third; followed by breast and cervical cancer, which ranked seventh. Cancers in trachea, bronchus and lung are the most common types of malignant tumors among Taiwanese men; cancers of the colon, rectum, and anal orifice was third; followed by mouth and prostate cancers, ranked seventh (Ministry of Health and Welfare, 2015).[2] On Feb 4, 2011, a forecast report of the International Agency for Research on Cancer (IARC) of the WHO pointed out that, smoking, drinking, unhealthy diet, lack of exercise and obesity, and other major risk factors accounted for 30% of cancer-related deaths, which can be prevented by establishing a healthy lifestyle and avoiding known risk factors.[3]

By mid 1990s, the emergence of the Internet has brought another wave of information revolution to humans. This technology, focusing on real time and two-way communication, is just in line with the enterprise's pursuit of the rapid flow of information and cost savings. Therefore, it has become the most powerful communication tool of the enterprise. The issue related to knowledge management attracted renewed attention in 1990s. All academic and industrial circles wanted to accumulate intelligence from employees by knowledge management based on the study results and experiences to accumulate business wealth. Network training is a product of Internet development. If the characteristics of network training can be used as basis for knowledge management, it might have a positive effect on the enterprise.

MATERIALS AND METHODS
Construction procedures of 3-step 5-level prevention and health care database
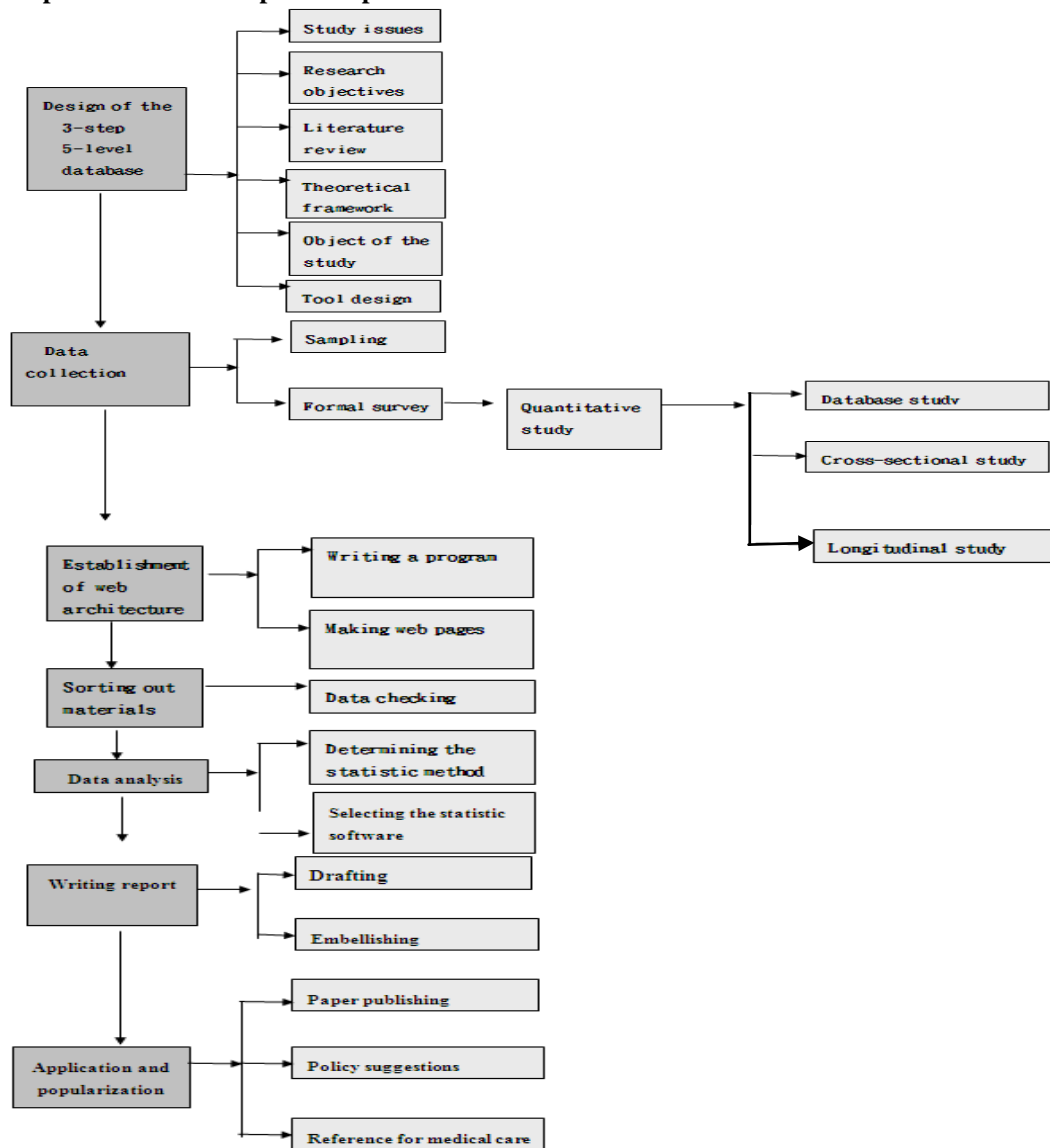

Fig. 1 Construction procedures of the 3-step 5-level prevention and health care database

Establishment of web architecture

Advantages
1. Knowledge sharing:
Can be learned anytime anywhere.
2. Research query:
With the large quantity of information and rich learning resources; more resources, except for the existing teaching materials, can be quickly searched on the Internet, providing much help in the accumulation of business intelligence.
3. Suggestion feedback:
An open and borderless Internet environment is the best place for knowledge sharing.

Fig. 2 Educational platform

Fig. 3 Taiwan NHI Papers

Fig. 4 Union knowledge database

Fig. 5 Survey and Research Database of an Academy

Website architecture

Fig. 6 Website architecture

RESULTS
Constructing the prevention and health care database website
The theoretical method of Statistical Science is used to make an evaluation, and the results are presented in a quantitative manner to provide a basis for decision making.

Table 1 shows the degree of satisfaction with the prevention and health care knowledge base. A total of 45 samples are in the study, of which 36 are female (80.0%). The average score is 4.33 (0.26). The mean score of the sub-questions has a high degree of agreement (M = 4.09–4.82). The variable "I think the interactive platform makes learning the course more interesting" (M = 4.82) scored highest; followed by I am willing to often use the platform as much as possible" (M = 4.42); "Online learning is not limited by time and space" (M = 4.36) takes the third place; "I think the interactive platform can have much time to promote the depth of courses" indicated the lowest average score (M = 4.09).

Table 1. Degree of satisfaction with the prevention and health care knowledge base (N = 45)

Variables	N (%)					
	Very dissatisfied	Dissatisfied	No opinion	Satisfied	Very satisfied	Mean (standard deviation)
1. I think the interactive platform makes learning the course more interesting.	0 (0.0)	0 (0.0)	0 (0.0)	8 (17.8)	37 (82.2)	4.82 (0.39)
2. I think the interactive platform is conducive to real-time knowledge sharing and problem solving.	0 (0.0)	0 (0.0)	0 (0.0)	38 (84.4)	7 (15.6)	4.16 (0.37)
3. I think the interactive platform promotes the courses in depth.	0 (0.0)	0 (0.0)	3 (6.7)	35 (77.8)	7 (15.6)	4.09 (0.47)
4. I think the platform is user-friendly.	0 (0.0)	0 (0.0)	5 (11.1)	23 (51.1)	17 (37.8)	4.27 (0.65)
5. The platform helps me learn the knowledge and skills I want to learn more.	0 (0.0)	0 (0.0)	2 (4.4)	29 (64.4)	14 (31.1)	4.27 (0.54)
6. Online learning is not limited by time and space.	0 (0.0)	0 (0.0)	3 (6.7)	23 (51.1)	14 (31.1)	4.36 (0.61)
7. I am willing to access the platform as much as possible.	0 (0.0)	0 (0.0)	0 (0.0)	26 (57.8)	19 (42.2)	4.42 (0.50)
8. My learning gains in the course of the platform.	0 (0.0)	0 (0.0)	0 (0.0)	34 (75.6)	11 (24.4)	4.24 (0.44)
Mean value (standard deviation)	4.33 (0.26)					

Analysis and comparison of person–time receiving eight prevention and health care services in all levels of special medical service institutions and the distribution of person–time across different ages in 2008–2014
Well-baby care services
In 2008−2014, in all levels of special medical service institutions, primary hospitals, followed by regional hospitals, have the most number of people receiving well-baby care services, peaking in 2009. Taipei has the most number of people receiving well-baby care services, followed by Taoyuan county. The most number of babies below one year old received well-baby care services in 2009; 2014 has the most number of babies aged less and more than one and half years old receiving well-baby care services. In 2011, the most number of babies aged 2-3 years old received well-baby care services. In 2010, the most number of babies aged 3-7 years old received well-baby care services. Medical centers, followed by primary hospitals have the most number of babies receiving well-baby care services. In 2014, the most number of babies received teeth fluoride service in 2014 in primary hospitals, followed by medical centers, and Taipei, followed by the New Taipei city, has the most number.

Prenatal care services
For prenatal care services, the most number of pregnant women received this service in 2012 and across all levels of special medical service institutions, primary hospitals, followed by regional hospitals have the most number of women receiving this service. Taipei is the city with the most number of pregnant women receiving this service, followed by Tainan. In 2014, the most number of women underwent pap smear examination, and in all levels of special medical service institutions, primary hospitals, followed by regional hospitals have the most number of women receiving the service. The total number of pregnant women received this examination the most in Taipei, followed by Taichung. In 2014, the most number of pregnant women received mammography, in both regional and area hospitals in the cities of Taipei followed by New Taipei.

In 2014, the most number of pregnant women aged 30–34, followed by those aged 25–29 received their first prenatal check-up. In 2012, the most number of women received their first check-up, in primary and area hospitals. In 2011, the most number of pregnant women aged 34 above received their first check-up in primary and area hospitals.

Other prevention and health care services
In 2014, the most number of people received adult preventive care, in primary and area hospitals in Taipei and Kaohsiung cities. In 2014, the most number of people received quantitative immunochemical fecal occult blood examination in primary and regional

hospitals in Taipei followed by New Taipei City. In 2012, the most number of people received oral mucosa examination in primary and regional hospitals in New Taipei followed by Taichung.

CONCLUSIONS
Contribution to academic research
The longitudinal study is applied to the study of health databases. Disease prevention screening, epidemiological trends and other related factors are realized and applied to clinical practice in order to provide reference for personal medical care and government policy. This paper actively promotes the construction of database supporting systems and improves the professional functions of prevention and health care. Combined with the related website platforms, it initiates and creates the related issues, enhances the culture of medical research and improves the quality of research.

Contributions to the industrial circle
The study helps complete the construction of knowledge platform and perfect related study results.

Link to other knowledge base management systems of medical care resources
The average degree of satisfaction of students using the prevention and health care knowledge database platform is 4.33 (0.26). This system can be used as a reference for future queries regarding prevention and health care knowledge databases.

REFERENCES
1. Chen JM. Community Health Care (6th Edition), 2014, Taipei: Huaxing.
2. Health Promotion Administration, Ministry of Health and Welfare (2015, June 17). 103 years of human death statistics. from Http://www.mohw.gov.tw/news/531349778.
3. Health Promotion Administration, Ministry of Health and Welfare (2014, April 15). The announced the number of new cases of cancer in 2011And ranked attention to emerging emerging carcinogenic factors! To prevent cancer from being taken quietly. http://health99.hpa.gov.tw/Hot_News/h_NewsDetailN.aspx?TopIcNo=6963.
4. Blue ZF. Statistical information, situational analysis, strategic thinking and administrative decision making - to better understand past and present and predict the future by statistical methods and contextual analysis. Monthly, 2002; 557: 94-97.
5. Chen JR. Epidemiology: Principles and Methods, 2014; Taipei: Lianjing.
6. Hattis R, Law M. The five stages of prevention: a practical new classification for health planning and clinical practice. [cited 2015 Jun 17]. Available from: http://www.capreventivemed.org/wp-content/themes/eventbrite-child/documents/Stages of Prevention 1-12.pdf.
7. Leavell H, Clark E. Preventive medicine for the doctor in his community an epidemiologic approach. New York: McGraw-Hill; 1958.
8. Last JM, Wallace RB. Public health and preventive medicine, 13th ed. London: Prentice-Hall International, 1992; 4-10.
9. Ronald PH, Melody SL.THE FIVE STAGES OF PREVENTION:A PRACTICAL NEW CLASSIFICATION FOR HEALTH PLANNING AND CLINICAL PRACTICE. 2008-2009 Concept, Draft Manuscript January. 2012; 1-20.