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Data Mining in Nursing: A Bibliometric Analysis (1990-2017)

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Abstract

To explore the current trends and future directions of data mining in nursing, we systematically searched English and Chinese databases (from 1990 to 2017) with data mining and nursing related keywords. We found 407 papers, which increased rapidly in the recent five years. Data mining was the most widely used in clinical nursing (50.6%). Chinese papers focused on exploring new nursing knowledge and rules, while English papers focused on promoting nursing practice by data mining.

Keywords:

Bibliometric analysis, Data mining, Nursing informatics

Introduction

Data mining is the process of unearthing information from large datasets using methods at the intersection of machine learning and statistics [1]. Data mining has become useful in assisting the discovery of nursing knowledge from big nursing data and transforming it into an understandable structure for further use [2]. This study aims to explore the current trends and future directions of data mining in nursing.

Methods

We systematically searched English databases (including Pubmed, Embase, and CINAHL), and Chinese databases (including China Biology Medicine, China National Knowledge Infrastructure and Wan Fang Database) with data mining and nursing related keywords. The database search covered the papers published between 1990 and 2017.

We analyzed the changing trend of literature, the main application areas of data mining in nursing, and the comparison between Chinese and international literature using bibliometrics analysis.

Results

We selected 407 papers, of which 112 (27.5%) were Chinese papers and 295 (72.5%) were English papers. The development of the literature presented an increasing trend annually, especially in the past five years (Figure 1). The number of papers from 2013 to 2017 accounted for 50.6% of the total papers. Data mining was the most widely used in clinical nursing (218, 53.6%), followed by community nursing and health management (61, 15.0%), nursing management (50, 12.2%), nursing education (37, 9.1%), and other aspects (41, 10.1%). The comparisons of the top 10 most cited articles showed that Chinese literature focused on exploring the new nursing knowledge and rules, while the English literature focused on promoting nursing practice by data mining. Table 1 lists the high-frequency keywords of data mining in nursing.

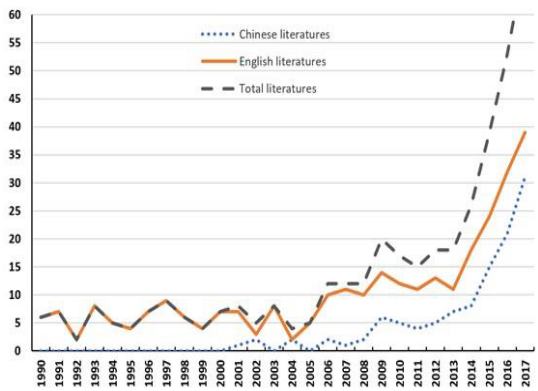

Figure 1– The trends of data mining papers published in English and Chinese databases

Table 1– The top ten high-frequency keywords of data mining in nursing

No.	Chinese literatures		International literatures	
	Keywords	Frequency n (%)	Keywords	Frequency n (%)
1	Data mining	112(100.0)	Data mining	295(100.0)
2	Nursing	98(87.5)	Nursing	233(79.0)
3	Medical informatics	52(46.4)	Nursing records	102(34.6)
4	Decision-making	43(38.4)	Decision-making	77(26.1)
5	Predictive model	36(32.1)	Nursing care	72(24.4)
6	Artificial intelligence	33(29.5)	Nursing informatics	70(23.7)
7	Nursing records	27(24.1)	Risk assessment	53(18.0)
8	Health policy	22(19.6)	Predictive model	51(17.3)
9	Knowledge discovery	17(15.2)	Elderly care	32(10.8)
10	Elderly care	13(11.6)	Nursing practice	11(3.7)

Discussion

The results are discussed in the context of data mining in clinical nursing. The authors offer their perspectives and insights on the results in this section. Potential impacts, plans, and recommendations for future work may also be presented here. It is important for authors to include a discussion of the limitations of their work and potential pitfalls in the interpretation of their results.

Conclusions

The data mining has penetrated different clinical nursing branches and has received attention progressively. The data mining concept is spread and accepted, and more efforts should be initiated to further strengthen the application of data mining in nursing.

References

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