Quantitative Evaluation Trial for Functions Embedded in Currently Available Electronic Clinical Pathways Products

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Abstract

No quantitative method is available to evaluate the functions of electronic clinical pathways (eCP) embedded in electronic medical records. Therefore, we developed new evaluation sheets in which the standard functions of eCP published in 2007 were modified to facilitate their quantification, and in which functions requested at Kawasaki Medical School Hospital were added when electronic medical records were introduced. eCP products by four vendors were evaluated quantitatively and each function was given a weight according to its importance. Moreover, we compared this quantitative evaluation to the subjective evaluation of four staff from the Committee of Clinical Pathways. The results indicated that the implementation of many functions differed among the four vendors, and the quantitative evaluations were comparable. The weights of each function may differ among hospitals due to differences in their medical background, and further studies regarding weighting are necessary. However, the method described in this study will be useful for quantitative evaluation of eCP functions.

Keywords:

Clinical pathways, Evaluation method, Electronic medical records, Standard functions, Quantification

Methods

The standard functions were classified into six categories: displaying, recording, ordering, editing, variance, and statistics according to S. Wakamiya, K. Yamauchi (International Journal of Medical Informatics, 2009;78(8):543-550). In this study, some functions included in these six categories were divided to facilitate quantitative evaluation of eCP. In addition, some functions requested by staff of the Committee of Clinical Pathways at Kawasaki Medical School Hospital were added to new function lists for investigation. Statistics functions are for secondary use but were added to new function lists for investigation as not all institutions in Japan have implemented data warehouses. Each function was given a weight of 1 to 10 points according to its significance. The weights were assigned by the staff of the Committee of Clinical Pathways. When each function was evaluated, fully embedded functions were given 1 point, partly embedded functions were given 0.5 points, and non-embedded functions were given 0 points. Four products were developed by four market leaders in electronic medical record systems in Japan in 2008 (A,B,C,D). Four staff members were chosen to evaluate the eCP, and they evaluated each eCP product subjectively based on their own business experience. Their results were expressed in five stages (5, better; 4, good; 3, neither good nor bad; 2, bad; 1, worse) and were compared with the quantitative evaluation.

Results

Table 1 – Points of quantitative evaluation

	A	B	C	D	Full points
Displaying	24	24	24	24	24
Recording	50.5	41	45	43	53
Ordering	70	51	60	60	82
Editing	33	13	33	31	33
Variance	30	22.5	20	25	30
Statistics	20	22.5	22.5	17	25
Total	233	174	205	200	247
Converting to 100 points	94	70	83	81	100

Table 2– Points of subjective evaluation

	A	B	C	D	Full points
Staff WS	5	2	4	4	5
Staff JU	5	2	4	4	5
Staff HM	5	2	4	4	5
Staff TH	5	1	4	4	5
Average	5	2	4	4	5
Converting to 100 points of Average	100	40	80	80	100

There were no significant differences between quantitative and subjective evaluation (Wilcoxson's sign rank sum test; $P = 0.625$)

Conclusion

The functions of eCP evaluated in this study will be those requested at many hospitals and their weight scores may be appropriate in a hospital environment. However, the method used in this study will be available and useful in other countries for quantitative and objective evaluation of eCP.

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