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An Online Knowledge Resource as a Continuing Pharmacy Education Tool to Support Reflective Learning in Miri Hospital

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Abstract:

Introduction: Participation in continuing professional development (CPD) is a professional and regulatory expectation of pharmacists. Pharmacists required to keep a CPD portfolio as a record of the list of learning activities attended. Online knowledge resources have been increasingly available to pharmacists and could be listed as a learning activity in the CPD portfolio. As pharmacists, it is important the clinical knowledge continuously updated, refreshed and improved to ensure better healthcare for the patients. We aimed to assess the use of online knowledge resources to document continuing professional development among pharmacists and the perception of using online resources as a reflective learning documentation.

Methods: A cross sectional study undertaken using a questionnaire to survey pharmacists in Pharmacy Department at Miri General Hospital, Sarawak. Data subjected to descriptive analysis, a 5-point Likert style scale used alongside attitudinal statements. Chi square used and Fischer's exact tests calculated.

Results: Out of 54 pharmacists from Hospital Miri, 51 of them were participating in the study. Intergroup associations made between reasons for using online resources and types of online resources, reasons for using online resources and perception regarding online resources as well as types of difficulties and perception regarding online resources.

Conclusion: The study shows that pharmacists change their preferences type of resources for different purposes of use. They use online resources mostly because they think that online resources save time and money, up-to-date, fun to use and help with work life balance. These perceptions likely support the continue use online resources when the pharmacists encounter difficulties in using them.

Introduction:

Continuing professional development (CPD) defined as "a continuing process enables individual doctors to maintain and improve standards of medical practice through the development of knowledge, skills and behaviour" by the Academy of Medical Royal Colleges in 2009 (1). The participation in CPD practiced since many years ago as a part of the professional expectation of medical doctors. Similarly, pharmacists have also required to keep a CPD portfolio as a record of the list of learning activities attended (2). This portfolio thought to be able to foster the self-directed learning by pharmacists (2).

Online knowledge resources have been increasingly available to pharmacists, and no longer limited to just medical doctors or general practitioners, and could be listed as a learning activity in the CPD portfolio (2). As pharmacists, or anyone who is working as medical professionals, it is important the clinical knowledge continuously updated, refreshed and improved to ensure better healthcare for the patients (1). A previous research stated that online based CPD sessions may be equally effective as face-to-face CPD sessions such as formal conferences and live presentations (1,3).

There are several advantages of online knowledge resources, which includes online videos or online presentations, digital images, audio files and presentation slides which can be found via the internet, and ability for the user to fit their time around study, work and family, information which continuously refreshed and updated; instead of relying on the printed materials which may have outdated after a few years as it shown in a recent study that global scientific publications (including medical) increases at a rate of 3% per annum from 1980 to 2012 (2-4). However, there are also disadvantages of using these online knowledge resources, such as feeling loneliness when studying alone, may not be suitable for all areas of work, and

may delay the rate of completion due to the overloaded information found online compared with the traditional method of using printed materials (4-6).

Another study in the United States showed that in 2001, only 2.7% of physicians who would use Internet for their continuing medical education, with an increase to about 31% of physicians in more recent years (1). This showed an increase in trend of using online knowledge resources by physicians in the US. In Malaysia, such studies have yet been found to be conducted, especially in reviewing the relevance of using online knowledge resources as documentation of reflective learning among pharmacists. Therefore, the objective of the study is to assess the use of online knowledge resources as a continuing pharmacy education tool to support reflective learning and the perception of using online resources as a reflective learning method.

The aim of this study is to determine how pharmacists in Miri General Hospital utilise online resources for reflective learning by identifying the types of resources used, with preferences of when and why those resources are used, the difficulties they encountered when using the resources and their perception regarding using them to support reflective learning (1).

Methods:

Development of questionnaire

A questionnaire designed comprising questions adapted from a previous survey which measured utilisation and perception of internet resources for continuing professional development (CPD) among general practitioners in Scotland. The survey used a combination of true/false questions, tick all that apply and five-point Likert style responses. The final survey consisted of 5 sections: demographic details, reasons for using online resources, types of online resources, types of difficulties encountered when using online CPD resources and perception regarding online CPD resources. All participants reassured that their identity be remain anonymous throughout the study. A copy of the questionnaire survey used is accessible in Appendix 1.

Subjects and recruitment

This study conducted in the Pharmacy Department at Miri General Hospital, Sarawak, which consists of about 54 pharmacists. After excluding those on annual leave or maternity leave, 51 pharmacists invited to complete a questionnaire. The questionnaire personally distributed by researchers to each participant and it was open for completion for four days. Responses motivated by goodwill, with no incentive for completion offered.

Data analysis

The collected data analysed and basic descriptive statistics including frequency counts and percentages related to individual question or statement responses generated. A 5-point Likert style scale used alongside attitudinal statements (using a scale where 1 = strongly agree and 5 = strongly disagree). Chi square used to analyse comparative groups if percentage of cells

with expected count less than 5 is below 25% and the observed counts are more than the minimum expected count. If these two assumptions violated, Fisher's exact test would be used for analysis, with $P< 0.05$ deemed significant. This performed using IBM SPSS Statistics version 21.

Results:

Out of 54 pharmacists from Hospital Miri, 51 of them were participating in the study and the response rate was 92.2% (47 respondents). A full demographic detail of respondent summarised in Table 1.

Table 1: Demographic details of pharmacist respondents

Characteristic	n = 47	%
Gender		
Female	41	87.2
Male	6	12.8
Age group in years		
<25	6	12.8
25-34	39	83.0
35-44	2	4.3
45-54	0	0.0
55-64	0	0.0
Role		
Fully registered pharmacist (FRP)	33	70.2
Provisionally registered pharmacist (PRP)	14	29.8

Intergroup association:

A) Reasons for using online resources and types of online resources (Table 2)

Comparative analysis showed that respondents had significant tendencies to obtain information to give to a patient by reading a journal online (p=0.047) and participating in webinar (p=0,033). When it came to answering a clinical question, respondents preferred reading a journal online (p=0.042). Online discussion board was a significant method for answering a non-clinical question (p=0.002). The other reasons of use were more likely to be answered with simulated patient scenarios (p=0.006).

B) Reasons for using online resources and perception regarding online resources (Table 3)

Respondents found that using online resources for the purpose of obtaining information to give to a patient would save money (p=0.015). Respondents thought that online resources save money (p=0.005), enjoyable (p=0.022) and agreed that they helped with work or life balance (p=0.045) when they used in answering a non-clinical question. For other reasons stated, respondents more likely using online resources because they were relevant to their learning (p=0.010), saved time (p=0.011), up-to-date (p=0.020) and saved money (p=0.049).

C) Types of difficulties and perception regarding online resources (Table 4)

Respondents might still use online resources opportunistically despite encounter the need for additional software for browser (p=0.043). In addition, the respondents perceived the online resources might be relevant to their learning (p=0.029), using CPD resources increased the accessibility of CPD topics (p=0.030) and agreed that they might help with work or life balance (p=0.011) even though additional software

needed for online browser. When respondents have internet connection problems other than speed, it might not change their preferences that using online resources saved money (p=0.021).

Table 2: Tabulation of association between reasons for using online resources and types of online resources

		Obtaining information to give to a patient	p-value	Answering a clinical question	p-value	Continuing professional development	p-value	Answering a non-clinical question	p-value	Others	p-value	None of the above reasons	p-value
Reading information online	1	35.5	0.471	31.0	1.000	26.5	0.292	40.9	0.474	66.7	0.214	100.0	0.511
	2	41.9		50.0		55.9		45.5		33.3		0.0	
	3	22.6		19.0		17.6		13.6		0.0		0.0	
	4	0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
Completing online learning modules	1	19.0	0.447	23.8	0.124	23.5	0.927	22.7	0.713	33.3	0.420	0.0	1.000
	2	61.3		59.5		58.8		54.5		33.3		100.0	
	3	19.4		16.7		14.7		22.7		33.3		0.0	
	4	0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		2.9		0.0		0.0		0.0	
Simulated patient scenarios	1	6.5	0.316	4.8	0.444	8.8	0.786	9.1	0.859	16.7	0.006	0.0	1.000
	2	45.2		40.5		35.3		40.9		33.3		0.0	
	3	41.9		50.0		50.0		45.5		16.7		100.0	
	4	6.5		4.8		5.9		4.5		33.3		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
Watching online videos	1	9.7	0.317	7.1	0.371	8.8	0.949	9.1	0.061	0.0	0.439	0.0	1.000
	2	54.8		50.0		50.0		68.2		83.3		100.0	
	3	32.3		35.7		32.4		18.2		16.7		0.0	
	4	3.2		7.1		8.8		4.5		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
Reading a journal online	1	48.4	0.047	50.0	0.042	58.8	0.302	59.1	0.544	66.7	0.756	100.0	1.000
	2	51.6		47.6		38.2		40.9		33.3		0.0	
	3	0.0		2.4		2.9		0.0		0.0		0.0	
	4	0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
Participation in webinar	1	3.2	0.033	4.8	0.102	2.9	0.326	0.0	0.054	0.0	1.000	0.0	1.000
	2	35.5		23.8		29.4		40.9		33.3		0.0	
	3	61.3		69.0		64.7		59.1		66.7		100.0	
	4	0.0		0.0		2.9		0.0		0.0		0.0	
	5	0.0		2.4		0.0		0.0		0.0		0.0	
Online discussion board	1	3.2	0.175	2.4	0.317	5.9	0.775	9.1	0.002	16.7	0.455	0.0	1.000
	2	22.6		16.7		17.6		31.8		16.7		0.0	
	3	54.8		57.1		52.9		36.4		50.0		100.0	
	4	12.9		11.9		14.7		13.6		16.7		0.0	
	5	6.5		11.9		8.8		9.1		0.0		0.0	
Twitter	1	0.0	0.565	0.0	0.414	0.0	0.501	0.0	0.699	0.0	0.687	0.0	0.574
	2	3.2		2.4		2.9		4.5		0.0		0.0	
	3	29.0		26.2		17.6		22.7		33.3		0.0	
	4	29.0		28.6		32.4		36.4		16.7		100.0	
	5	38.7		42.9		47.1		36.4		50.0		0.0	
Facebook	1	3.2	0.911	2.4	0.533	2.9	0.755	4.5	0.677	0.0	1.000	0.0	0.574
	2	3.2		2.4		5.9		4.5		0.0		0.0	
	3	25.8		23.8		20.6		27.3		16.7		0.0	
	4	25.8		26.2		26.5		27.3		33.3		100.0	
	5	41.9		45.2		47.1		36.4		50.0		0.0	

Table 3: Tabulation of association between reasons for using online resources and perception regarding online resources

		Obtaining information to give to a patient	p-value	Answering a clinical question	p-value	Continuing professional development	p-value	Answering a non-clinical question	p-value	Others	p-value	None of the above reasons	p-value
I am comfortable using online resources	1	45.2	0.840	47.6	0.109	52.9	0.648	50.0	1.000	83.3	0.291	0.0	1.000
	2	51.6		52.4		44.1		50.0		16.7		100.0	
	3	3.2		0.0		2.9		0.0		0.0		0.0	
	4	0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
I like choosing online resources topics relevant to my learning	1	45.2	0.632	45.2	0.417	47.1	0.883	50.0	0.904	100.0	0.010	0.0	1.000
	2	45.2		50.0		47.1		45.5		0.0		100.0	
	3	9.7		4.8		5.9		4.6		0.0		0.0	
	4	0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
Sometimes I use online CPD resources opportunistically	1	9.7	0.142	9.5	0.091	14.7	0.703	9.1	0.122	33.3	0.427	0.0	0.085
	2	54.8		57.1		55.9		54.5		50.0		0.0	
	3	32.3		26.2		20.6		36.4		16.7		0.0	
	4	3.2		7.1		8.8		0.0		0.0		100.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
Linking completed use of online resources into my CPD evidence would be useful to me	1	29.0	0.218	23.8	0.495	29.4	0.497	31.8	0.365	33.3	0.866	0.0	1.000
	2	51.6		50.0		41.2		50.0		50.0		100.0	
	3	19.4		26.2		29.4		18.2		16.7		0.0	
	4	0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
I find using online CPD resources increase the accessibility of CPD topics	1	19.4	0.484	19.0	0.059	26.5	0.470	37.3	0.752	50.0	0.261	0.0	1.000
	2	61.3		57.1		52.9		54.5		50.0		100.0	
	3	16.1		23.8		17.6		18.2		0.0		0.0	
	4	3.2		0.0		2.9		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
I find using online resources saves me time	1	41.9	0.274	38.1	0.073	38.2	0.385	50.0	0.160	50.0	0.011	0.0	1.000
	2	41.9		45.2		47.1		36.4		0.0		100.0	
	3	12.9		14.3		8.8		13.6		33.3		0.0	
	4	0.0		2.4		2.9		0.0		16.7		0.0	
	5	3.2		0.0		2.9		0.0		0.0		0.0	
I usually find online resources are up to date	1	16.1	0.712	16.7	0.311	17.6	0.547	13.6	0.765	33.3	0.020	0.0	1.000
	2	51.6		52.4		50.0		63.6		16.7		100.0	
	3	25.8		23.8		20.6		18.2		16.7		0.0	
	4	6.5		7.1		11.8		4.5		33.3		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
I usually find online resources easy to use	1	22.6	0.808	23.8	0.120	23.5	0.944	27.3	0.574	33.3	0.143	0.0	1.000
	2	58.1		57.1		55.9		63.6		33.3		100.0	
	3	16.1		16.7		14.7		18.2		16.7		0.0	
	4	0.0		2.4		2.9		4.5		16.7		0.0	
	5	3.2		0.0		2.9		0.0		0.0		0.0	
Using online resources saves me money	1	35.5	0.015	26.2	0.346	23.5	0.977	45.5	0.005	5.0	0.049	0.0	1.000
	2	32.3		42.9		44.1		27.3		0.0		100.0	
	3	22.6		23.8		23.5		18.2		33.3		0.0	
	4	6.5		2.4		2.9		4.5		0.0		0.0	
	5	3.2		4.8		5.9		4.5		16.7		0.0	
I usually find online resources enjoyable	1	12.9	0.289	9.5	1.000	8.8	0.843	18.2	0.022	16.7	0.083	0.0	0.532
	2	45.2		45.2		50.0		54.5		50.0		0.0	
	3	41.9		42.9		38.2		27.3		16.7		100.0	
	4	0.0		2.4		2.9		0.0		16.7		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
Using online resources helps with my work / life balance	1	32.3	0.670	28.6	0.257	35.3	0.164	45.5	0.045	50.0	0.082	0.0	1.000
	2	41.9		45.2		38.2		36.4		16.7		100.0	
	3	22.6		23.8		20.6		18.2		16.7		0.0	
	4	3.2		2.4		5.9		0.0		16.7		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	
Online resources allow me to plan my CPD work more efficiently	1	19.4	0.920	19.0	1.000	20.6	0.446	27.3	0.440	33.3	0.329	0.0	0.574
	2	45.2		42.9		47.1		40.9		16.7		0.0	
	3	35.5		38.2		32.2		31.8		50.0		100.0	
	4	0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0	

Table 4: Tabulation of association between types of difficulties and perception regarding online resources

		Slow internet connection	p-value	Needing additional software for browser	p-value	Access to website restricted by health board	p-value	Problems logging into online CPD resources	p-value	Internet connection problems other than speed	p-value	Incompatible browser	p-value	Problems with additional software downloaded	p-value	Problems logging into computer	p-value	Other (eg. Incompatible with tablet computer, resource timing out, cannot access health board intranet from home, no audio output)	p-value
I am comfortable using online resources	1	44.1	0.648	45.5	0.361	50.0	0.414	65.0	0.109	42.9	0.373	58.3	0.805	40.0	0.781	50.0	1.000	50.0	0.608
	2	52.9		45.5		50.0		35.0		50.0		41.7		60.0		50.0		44.4	
	3	2.9		9.1		0.0		0.0		7.1		0.0		0.0		0.0		5.6	
	4	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
I like choosing online resources topics relevant to my learning	1	41.2	0.682	63.6	0.029	47.1	0.883	55.0	0.236	42.9	0.362	33.3	0.577	50.0	0.115	50.0	1.000	44.4	1.000
	2	52.9		18.2		47.1		35.0		42.9		58.3		30.0		50.0		50.0	
	3	5.9		18.2		5.9		10.0		14.3		8.3		20.0		0.0		5.6	
	4	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Sometimes I use online CPD resources opportunistically	1	14.7	0.549	27.3	0.043	8.8	0.611	20.0	0.708	7.1	0.265	8.3	0.165	0.0	0.164	0.0	0.724	16.7	0.817
	2	50.0		27.3		55.9		50.0		50.0		41.7		50.0		50.0		50.0	
	3	29.4		45.5		26.5		25.0		42.9		50.0		50.0		50.0		22.2	
	4	5.9		0.0		8.8		5.0		0.0		0.0		0.0		0.0		11.1	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Linking completed use of online resources into my CPD evidence would be useful to me	1	29.4	0.699	36.4	0.339	23.5	0.373	20.0	0.287	28.6	0.603	25.0	1.000	10.0	0.277	0.0	0.361	38.9	0.091
	2	44.1		27.3		52.9		40.0		35.7		50.0		70.0		50.0		50.0	
	3	26.5		36.4		23.5		40.0		35.7		25.0		20.0		50.0		11.1	
	4	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
I find using online CPD resources increase the accessibility of CPD topics	1	20.6	1.000	45.5	0.030	20.6	0.223	30.0	0.240	21.4	0.563	25.0	1.000	20.0	0.773	50.0	0.278	16.7	0.602
	2	55.9		36.4		61.8		60.0		57.1		58.3		70.0		25.0		61.1	
	3	20.6		9.1		17.6		10.0		14.3		16.7		10.0		25.0		16.7	
	4	2.9		9.1		0.0		0.0		7.1		0.0		0.0		0.0		5.6	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
I find using online resources saves me time	1	35.3	0.665	36.4	0.104	38.2	0.385	45.0	0.253	50.0	0.272	41.7	0.945	40.0	0.456	75.0	0.458	27.8	0.547
	2	47.1		27.3		47.1		50.0		35.7		41.7		40.0		25.0		44.4	
	3	14.7		18.2		11.8		5.0		7.1		16.7		10.0		0.0		22.2	
	4	0.0		9.1		2.9		0.0		0.0		0.0		10.0		0.0		0.0	
	5	2.9		9.1		0.0		0.0		7.1		0.0		0.0		0.0		5.6	
I usually find online resources are up to date	1	14.7	1.000	18.2	0.073	17.6	0.759	20.0	0.304	14.3	0.737	8.3	0.740	10.0	0.310	50.0	0.152	11.1	0.743
	2	55.9		36.4		55.9		65.0		57.1		50.0		40.0		25.0		50.0	
	3	20.6		18.2		17.6		10.0		14.3		33.3		30.0		25.0		27.8	
	4	8.8		27.3		8.8		5.0		14.3		8.3		20.0		0.0		11.1	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
I usually find online resources easy to use	1	20.6	0.688	27.3	0.074	26.5	0.089	30.0	0.229	14.3	0.469	25.0	1.000	20.0	0.477	50.0	0.425	16.7	0.673
	2	61.8		36.4		61.8		65.0		57.1		58.3		50.0		50.0		66.7	
	3	14.7		18.2		8.8		5.0		21.4		16.7		20.0		0.0		11.1	
	4	0.0		9.1		2.9		0.0		0.0		0.0		10.0		0.0		0.0	
	5	2.9		9.1		0.0		0.0		7.1		0.0		0.0		0.0		5.6	
Using online resources saves me money	1	26.5	0.258	18.2	0.267	29.4	0.231	20.0	0.879	35.7	0.021	41.7	0.248	30.0	0.250	25.0	0.858	33.3	0.600
	2	38.2		27.3		47.1		50.0		14.3		25.0		20.0		75.0		44.4	
	3	29.4		36.4		17.6		25.0		42.9		33.3		20.0		0.0		16.7	
	4	2.9		9.1		2.9		5.0		7.1		0.0		10.0		0.0		5.6	
	5	2.9		9.1		2.9		0.0		0.0		0.0		0.0		0.0		0.0	
I usually find online resources enjoyable	1	8.8	0.256	18.2	0.119	8.8	1.000	10.0	0.949	14.3	0.586	8.3	0.400	10.0	0.212	25.0	0.337	0.0	0.350
	2	52.9		45.5		47.1		50.0		35.7		66.7		30.0		25.0		57.6	
	3	38.2		27.3		41.2		40.0		50.0		25.0		50.0		50.0		44.4	
	4	0.0		9.1		2.9		0.0		0.0		0.0		10.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Using online resources helps with my work / life balance	1	35.3	0.201	45.5	0.011	35.3	0.135	35.0	0.256	35.7	0.365	41.7	0.402	20.0	0.463	25.0	1.000	27.8	1.000
	2	44.1		36.4		38.2		35.0		50.0		50.0		60.0		50.0		44.8	
	3	17.6		0.0		23.5		30.0		7.1		8.3		10.0		25.0		22.2	
	4	2.9		18.2		2.9		0.0		7.1		0.0		10.0		0.0		5.6	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Online resources allow me to plan my CPD work more efficiently	1	20.6	0.446	27.3	0.488	23.5	0.331	25.0	0.261*	21.4	0.282*	25.0	0.565	10.0	0.727	50.0	0.304	22.2	0.602*
	2	47.1		27.3		44.1		50.0		57.1		50.0		40.0		25.0		33.3	
	3	32.4		45.5		32.4		25.0		21.4		25.0		50.0		25.0		44.4	
	4	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	5	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	

Discussion:

Reading online journal has shown to be a preferred way for pharmacists to provide information to patients and to answer clinical questions. An online journal can only assessed when there is internet. A survey concerning Internet use and learning conducted among 2,200 U.S. office-based physicians of all specialties (4). Nearly all physicians have access to the Internet, know how to use it, and access it for medical information, with the main reason for use in professional development and information seeking to provide better care for patients (4). Another study in Glasgow that examines primary care staff's use of the Internet shows most of them now have access to the Internet and use it to look up healthcare information (5). A survey among US practicing physicians in several specialties showed that peer-reviewed journal articles are one of the most useful sources of medical information by physicians (6). Pharmacists similarly can access online journals in assisting them obtaining information to answer a patient or clinical questions.

Webinar also used to provide information to patients. Webinars are presentations, lectures, workshops, or seminars transmitted over the Internet and are usually live and interactive (7). In a survey among pharmacists, majority of the respondents stated their reason for attending webinars is to study a topic in more depth (7). This allows them to provide accurate and up-to-date information to patients. Another study has also shown the participants who are pharmacists, benefited from access to accredited webinars especially for those in rural and remote locations (8). They could benefit from learning about the latest pharmaceutical news and educated on innovative patient consultation techniques.

Non-clinical questions encompass all sorts of questions either from health care professionals or from the public. Online discussion board will have different people from all walks of life

contributing to a question. Therefore, the discussion will have diverse answers which will be helpful in answering the non-clinical questions. Results from a survey among nursing students showed that all the students agreed or strongly agreed the online discussion forum contributed to their learning (9). Pharmacists can also benefit from using an online discussion board and help in answering non-clinical questions.

Other questions encountered by pharmacists are more likely to be answered with simulated patient scenarios. The benefit of simulation is that it does not risk patients' lives; at the same time provide standardisation of cases (10). It also enables health care professionals to master clinical skills as it promotes critical-thinking, clinical-decision making, and psychomotor skills (10). Furthermore, important aspects of patient safety can be emphasized, such as prevention of medication errors, promotion of effective communication, and the importance of teamwork (10). Pharmacists can gain knowledge from simulated patient scenarios to answer different types of problems they encounter.

Providing drug information is one of the responsibilities of all pharmacists (11). Free accessible databases like Pubmed and Google scholar allowed for acquisition of credential resources. Thus, this is a money-saving way to acquire information in order to answer clinical or non-clinical questions and for other health care related purposes.

Some of the online resources incorporate videos, quizzes and role-play scenarios (12) which make answering a non-clinical question more fun and enjoyable. Finding answers for non-clinical questions is faster with online resources as the internet and advancing mobile technology enabled convenient and quick access to medical information (11). In addition, flexible communications with mobile devices allowed convey of information to consumers in

a more convenient way (13). As a result, job can be done rapidly and a pharmacist can have more time for personal life leading to a better work life balance.

There is a wealth of information available over the internet. It is depending on the ability of a user to clinically evaluate the resources and extract those relevant to their learning (14). If a combination use of multiple resources is used, it can enhance and validate the information obtained from each source (14). The development of medical software applications (apps) like Medscape, Medline and Micromedex has made the practice of evidence-based medicine at the point of care more convenient and time saving (13). This is due to the portability of mobile devices, rapid access to multiple drug information resources, flexible communications, and a plenty of choice of powerful apps to accomplish many different purposes (13). Online resources updated for example updates with email, news and twitter to constantly feeding the users with newest information (15).

Although some of the pharmacists find it a barrier to use CPD online resources when additional software needed for the browser, they still use the online resources opportunistically especially the CPD topic is relevant to their learning or if the resources increase the accessibility of CPD topics. Often when coming to self-learning, people prefer to choose the area of interest and relevant to their needs instead of provided with a non-relevant one. For CPD to be effective it must meet the needs of individual health professionals, of the populations they serve, and the organisations within which they work (16). Our result showed that CPD linked to personal “learning needs” in their own preferred learning style and this can effectively used in their practice. This matches the view of the report from the College of Emergency Medicine in 2010 (16).

According to the report by Schostak J et al, majority of the doctors agreed that using CPD would build their confident and professionalism when approaching their patients and other healthcare professionals (16). Similar to pharmacists, CPD may increase their confident and professionalism when they are communicating with the patients or other healthcare professionals. Therefore, they may prefer CPD topics which are relevant to their specialised area.

Studies showed that lack of time and job constraint were the main barriers to CPD participation (17). However, our results showed that pharmacists feel that using online resources helps with their work or life balance. CPD learning intended to be more experiential and informal whereby it encourages pharmacists to find their own learning needs and to find activities to fulfil those needs (17). Pharmacists may find their own free time for CPD at home. On the other hand, continuing education (CE) intended to meet the needs of a group of pharmacists which does not fully meet individual needs (17). Hence, the time and venue for CE fixed. Pharmacists may find it hard to cope with their heavy workload if attending CE, or they may miss out the topic they interested if they cannot attend the CE.

Besides time and work constraint, lack of financial support is another barrier to the CE (18). To attend courses, pharmacists may need to pay themselves for the courses they interested. On the other hand, there are some free CPD provided if the pharmacist registered under the specific pharmacy council of the same country of provider. In this study, even though respondents have internet connection problems other than speed, it did not change their preferences that using online resources saved money. This showed that lack of financial could be a barrier to participation if they need to pay for accessing CPD (18). Employer may pay

for the cost of CPD activities for job recruitment or retention as this could improve employees' self-development in their specialised area.

Limitation

The population target (hospital pharmacists) and size in this study is limited. Hence, our study represents how the hospital pharmacists utilise online resources as a reflecting learning and their perception on using it rather than those working as community, primary care, or pharmaceutical pharmacists. Besides, the results may affected by age and gender. The age group in our study is mostly between 25 and 34 years old. While many devices have been advanced across different generations, young adults are the main group to own a laptop as everyone know how to use it online (19). Therefore, they prefer online resources than printed materials as it saves time and money. As for different gender, the differences in work pattern will affect how they perceive the usefulness of using CPD online (20). In our study, there were higher numbers of female participants than male which may affect the outcome. The results will affected if pharmacists could not correctly identify the definition of CPD. A study by Aziz et al. in 2013 showed that in Malaysia, there were only 31.3% of pharmacists in the study able to distinguish CPD from CE (17).

Conclusion:

The study shows that pharmacists change their preferences type of resources for different purposes of use. They use online resources mostly because they think that online resources save time and money, up-to-date, fun to use and help with work life balance. These perceptions likely support the continue use online resources when the pharmacists encounter difficulties in using them.

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Appendix 1: Questionnaire

As part of our research project, we are conducting a survey that investigates ***An Online Knowledge Resource as a Continuing Pharmacy Education Tool to Support Reflective Learning***. We would appreciate if you could complete the following questionnaire. Any information obtained in connection with this study that can be identified with you will remain confidential.

A. Demographic Details:

1. **Gender**: MALE / FEMALE
2. **Age group in years**:

	< 25
	25-34
	35-44
	45-54
	55-64

3. **Role**: FRP / PRP

B. When do you usually use the online resources?

	Obtaining information to give to a patient
	Answering a clinical question
	Continuing professional development
	Answering a non-clinical question
	Others
	None of the above reasons

C. These types of online resources are of high value and accuracy, and are frequently used as resource for CPD:

	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
Reading information online					
Completing online learning modules					
Simulated patient scenarios					
Watching online videos					
Reading a journal online					
Participation in webinar					
Online discussion board					
Twitter					
Facebook					

D. Which are the types of difficulties encountered when using online CPD resources?

	Slow internet connection
	Needing additional software for browser
	Access to website restricted by health board
	Problems logging into online CPD resources
	Internet connection problems other than speed
	Incompatible browser
	Problems with additional software downloaded
	Problems logging into computer
	Other (eg. Incompatible with tablet computer, resource timing out, cannot access health board intranet from home, no audio output)

E. The following measures your perception regarding online CPD resources, please choose the appropriate one:

Strongly Agree (1)	**Agree (2)**	**Neutral (3)**	**Disagree (4)**	**Strongly Disagree (5)**

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
I am comfortable using online resources					
I like choosing online resources topics relevant to my learning					
Sometimes I use online CPD resources opportunistically					
Linking completed use of online resources into my CPD evidence would be useful to me					
I find using online CPD resources increase the accessibility of CPD topics					
I find using online resources saves me time					
I usually find online resources are up to date					
I usually find online resources easy to use					
Using online resources saves me money					
I usually find online resources enjoyable					
Using online resources helps with my work / life balance					
Online resources allow me to plan my CPD work more efficiently					