

Transnational Evaluation of a Continuing Professional Development Activity for Biomedical Scientists Based on the Clinical Laboratory Pre-analytical Phase

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Abstract: The 'Enhancing Hospital Laboratory Standards for Continuing Professional Development: A Quality Improvement Toolkit' project, which was funded by the European Union's Lifelong Learning Leonardo Program, has successfully developed several novel continuing professional development (CPD) activities for use by Biomedical Scientists within European hospital laboratories. This paper reports on transnational evaluation of the third European CPD activity which is based on the pre-analytical phase, by hospital laboratories in Croatia, Czech Republic, Malta and the United Kingdom.

Keywords: Continuing Professional Development, Training, Medical Laboratory Science, Biomedical Scientist, Pre-analytical

1. Introduction

While a wide variety of different types of activities including work based learning, professional activity, formal/educational and self-directed learning [1], are appropriate for inclusion in a Biomedical Scientists continuing professional development (CPD) portfolio, for many Biomedical Scientists, CPD has mostly focussed on individual activities. Although in recent years there has been an increased emphasis for inclusion of reflection on CPD activities, again this has tended to be carried out on an individual basis. One of the main aims of this project was to bring Biomedical Scientists from different European countries together to learn from each other and to develop new CPD activities which could be carried out in groups where they could provide a platform for collaborative learning.

Collaborative CPD has been shown to be beneficial in a number of fields including education where it has been associated with enhancing teaching and learning and providing an opportunity for a variety of positive impacts on both teachers and students [2]. The benefit of collegial interaction as a method of CPD has also previously been highlighted in the healthcare arena where a group of general surgeons clinical expertise was enhanced by discussions with colleagues via videoconferencing [3].

This project sought to have CPD activities carried out by multi-disciplinary groups of Biomedical Scientists in their own countries and to follow this up with interaction with the newly developed European Biomedical Scientist CPD Providers Community of Practice. European partner organisations from the University of Wolverhampton in the United Kingdom, Mater Dei hospital in Malta, Regional Hospital T Bati in Czech Republic, Croatian Metrology Society in Croatia and Horvath and Dubecz in Hungary received European Union funding to carry out the project entitled 'Enhancing Hospital Laboratory Standards for CPD: A Quality Improvement Toolkit'. Throughout the project, the partners shared and developed good practice in continuing professional development for biomedical scientists by

collaboratively developing an EU-Toolkit [4] for delivery of high quality continuing professional development (CPD) activities for use by Biomedical Scientists within European hospital laboratories. A hospital laboratory CPD Providers Community of Practice network was also developed which included four exemplar hospital laboratory CPD activities based on active learning methods (Table 1). Partners carried out pilot trials [5, 6] of the new CPD activities in their own organisations with every pilot trial including evaluation by both trainees and trainers in partner countries.

Table 1. New CPD Activities Developed During the Project.

CPD Activity	Topic of CPD Activity
1	Health and Safety [5]
2	ISO 15189 [6]
3	Pre-analytical phase
4	Errors in Laboratory Medicine

Both the EU-Toolkit and the European Biomedical Scientist CPD Providers Community of Practice network are available at the Project's website and are accessible in all four partner languages: English, Czech, Croatian and Hungarian [7].

2. Methods

The 'Enhance It: Enhancing Hospital Laboratory Standards for CPD: A Quality Improvement Toolkit' EU funded project was a Leonardo Partnership between different organisations in five EU member countries as shown Table 2. The project which began during July 2013, ran for two years and was completed in July 2015. During the course of the project, which initially received funding of over 100,000 euros from the European Union's Lifelong Learning [8] Leonardo Partnership [9] Program, partner organisations worked together to develop an EU-Toolkit, a Community of Practice and several novel CPD activities. Throughout the project, transnational meetings were held in the UK [10] Croatia [11], Czech Republic [12], Hungary [13] and Malta [14].

Table 2. The Partner Organisations.

EU Country	Organisation	Category of Partner
Croatia	Croatian Metrology Society www.hmd.hr	Vocational Education and Training Provider
Czech Republic	Regional Hospital T Bata Inc http://www.kntb.cz/	World of Work
Hungary	Horvath and Dubecz Consulting Ltd www.horvathesdubecz.hu	Vocational Education and Training Provider
Malta	Mater Dei Hospital https://health.gov.mt/en/MDH/Pages/Home.aspx	World of Work
United Kingdom	University of Wolverhampton www.wlv.ac.uk	Vocational Education and Training Provider

This paper is one of a series of studies which report on transnational evaluation of each of the novel CPD activities which were developed as part of the tangible outputs of the project. Both the first CPD activity which was developed by the UK [5] and the second CPD activity which was developed by Croatia [6] have already received very positive transnational evaluation. This current study is the third paper in the series and reports on evaluation of the third CPD

activity which was developed by the Czech Republic.

In this study, a third CPD activity was developed for Biomedical Scientists on the topic of 'The Pre-analytical Phase'. Over 180 Biomedical Scientists from the partner countries of Croatia, Czech Republic, Malta and United Kingdom took part in the third CPD activity. At the beginning of the CPD session, Biomedical Scientists were required to answer the Pre-analytical questions in Table 3. In

accordance with the format of the previous two CPD activities, on completion of the exercise participants were then organised into small groups where they were given the opportunity to discuss their findings with their colleagues. Biomedical Scientists then completed a reflective learning sheet which required them to reflect on what they had learned, how useful they felt that their learning from the CPD activity would be in their future day-to-day practice and to provide any suggestions for future development possibilities. At the end of the CPD session participants were required to complete an evaluation questionnaire (the questions are shown in Table 4).

Table 3. Pre-Analytical Questions.

Question Number	Question
	Part 1 – Patient Preparation
1	Is exercise allowed before taking samples for laboratory tests?
2	Can stress affect laboratory test results?
3	Is sex allowed before taking samples for laboratory testing ?
4	Is alcohol consumption advised before blood sampling?
5	Is eating allowed before taking samples for any laboratory tests?
6	Is it allowed to take antihypertensive drugs before blood count testing?
7	Is it advisable to drink water in the morning before blood sampling?
8	Is smoking allowed before taking samples for any laboratory tests?
9	Can posture affect samples taken for laboratory sampling?
10	Is there an optimal time for the collection of laboratory samples?
	Part 2 – Quality of Sample (Text Questions)
11	Is a long tourniquet time (over 1 minute) optimal for blood sampling?
12	Is an open sampling system (syringe and needle) optimal for blood sampling?
13	Does the additive/preservative used or sample volume affect laboratory test results?
14	When a cervical screening sample is taken, should an endocervical sampling brush always be used to sample the cervix in conjunction with a cervix brush for all samples.
15	Does the use of lubricant affect the quality of cervical screening samples?
16	A Cerebral Spinal Fluid (CSF) is received from a patient with the clinical history querying bacterial meningitis and it is stated that antibiotic treatment has begun. Is this sample suitable for bacterial culture?
	Part 3 – Quality of Sample (Photo Questions)
17	 Is this sample safe for laboratory staff?
18	 Is this a suitable sample for blood gas analysis?

Question Number	Question
19	 Are the patient details clearly identifiable?
20	 Can the laboratory accept this sample?
21	 Is this bottle optimal for this tissue sample?
22	 Is this the optimal volume of fluid for fixation of this size tissue sample?
23	 This blood sample arrived with a request form stating that the sample was a blood culture. What should you do next?
24	 Does the photograph below show the correct sample for a patient with a clinical history of sepsis?

3. Results

This paper reports on the third stage of the Leonardo Partnership Project entitled ‘Enhance It’ which involved transnational evaluation of a third CPD activity by hospital laboratories in Croatia, Czech Republic, Malta and the United Kingdom.

Over one hundred and eighty Biomedical Scientists from four different European countries Croatia (n=11), Czech Republic (n=9), Malta (n=137) and UK (n=26) took part in this new CPD activity. Biomedical Scientists evaluated the activity and indicated (Table 4) that the exercise had been useful and appropriate to their scope of practice (82.4%) and relevant for their own CPD (83.1%). Discussion with colleagues following completion of the activity provided useful enhancement to both scope of practice (75.2%) and CPD (89.5%). Subsequent completion of a reflective learning sheet was shown to be beneficial for 89% of participants and over 97% of Biomedical Scientists rated the exercise overall as good or excellent. Responses indicated that the CPD activity could have been enhanced by clearer photos, more

difficult questions and the inclusion of a questions covering a wider range of laboratory disciplines.

Table 4. Responses to Evaluation Questions.

Question	Response	Croatia % n = 11	CZE % n = 9	Malta % n = 137	UK % n = 26
Do you feel that the exercise is useful and/or appropriate to your scope of practice?	Strongly Agree	100	44	44	0
	Agree	0	56	47	23
	Neither Agree nor Disagree	0	0	7	8
	Disagree	0	0	2	50
	Strongly Disagree	0	0	0	19
	Answer Not Given	0	0	0	0
Is the format of this exercise new to you?	Strongly Agree	0	22	10	4
	Agree	0	33	32	19
	Neither Agree nor Disagree	0	22	11	8
	Disagree	100	22	35	38
	Strongly Disagree	0	0	8	31
	Answer Not Given	0	0	4	0
How long did it take to complete this exercise?	Time Taken in minutes (mean)	30	20	118	25
Do you feel that this is relevant CPD? Please explain why/why not/	Yes	100	100	92	23
	No	0	0	8	73
	Answer Not Given	0	0	0	4
Were instructions easy to follow/understand? If not, what would have helped?	Yes	100	100	94	65
	No	0	0	6	35
	Yes	0	0	91	50
Was the discussion element useful to your scope of practice?	No	100	100	9	35
	Answer Not Given	0	0	0	15
	Yes	100	100	96	47
Was the discussion element useful to your CPD?	No	0	0	4	38
	Answer Not Given	0	0	0	15
	Yes	100	100	92	65
Was the reflection/reflective sheet useful to your CPD?	No	0	0	8	23
	Answer Not Given	0	0	0	12
	Excellent/Very useful	100	0	92	0
Overall how would you rate the complete CPD exercise?	Good/Useful	0	100	8	74
	Poor/Not Useful	0	0	0	0
	Question Not Answered	0	0	0	26

4. Discussion

With regard to the topic of the third CPD activity, most Biomedical Scientists agreed that the topic of 'Pre-analytical Phase' was directly related to their work, was very relevant and that it had been helpful to refresh their knowledge and gain a better understanding of the subject. One Biomedical Scientist also commented that the

'Pre-analytical phase is very important but not always considered as such ... this is important information that laboratory staff should know.'

The format of the CPD activity was well received by Biomedical Scientists in all European Union partner countries. They appreciated the interesting interactive approach which proved to be beneficial as it included a discussion element which was felt to be very important. Although a few of the CPD questions were perceived by some participants as being oversimplified, others liked the format of.

'simple questions which make you research the answer and [facilitate] learning on the way'.

Suggested improvements which were put forward included having more in depth case studies, more challenging questions and the use of.

'online learning [with a] conference call meeting with all

countries involved'.

There were three main important themes emphasized by participants during evaluation of the pre-analytical CPD activity namely; collaborative learning, the value of a multidisciplinary learning approach and the impact on day to day practice of the learning undertaken and knowledge gained.

Collaborative learning has previously been shown to assist science teachers with their professional development in the area of technological, pedagogical and content knowledge by providing a platform for swapping and refining ideas [15]. In the current study, similar beneficial aspects of the collaborative approach to CPD employed in this activity were highlighted by several participants who commented on the advantages of an interactive session. One of the beneficial themes of the collaborative learning environment which was highlighted by several participants was that of enhanced learning when compared to the usual passive listening CPD sessions which they usually attended. One of the participants commented that the session had been.

'highly appropriate as one learns more through discussion'

while other Biomedical Scientists supported that view and stated that

'it teaches things that are not so easily learned through study'

which in turn

'promotes thought and research'

The positive aspects of learning within a multidisciplinary arena were highlighted by several Biomedical Scientists. One of the participants stated that

'the exercise was very helpful especially in my case as I don't practice in clinical chemistry or haematology and it permitted me to understand better some concepts related to blood sampling'

and another Biomedical Scientist commented that

'I learned some issues which I didn't know beforehand, especially concerning tests in other labs'

whereas the comparison between the different laboratory disciplines was the focus of a further feedback comment

'it was interesting to realise that things that other laboratories encounter every day and are important for them but are insignificant for us'

While one of the main aims of CPD is for it to lead to a positive influence on day-to-day practice, the impact of CPD can be difficult to measure [16]. Many factors have been shown to influence its impact including; the regulatory context within the dental profession [17] and social processes within aspiring school principals [18]. Novel ways of measuring the impact of CPD have been developed including production of a score sheet for use by pharmacists to enable quantification of the impact and relevance of their CPD [19]. In the current study Biomedical Scientists were asked to make an individual assessment of the impact of this CPD activity on their own daily practices. The results were very positive with Biomedical Scientists commenting that they would apply learning from the CPD session when comparing the results from two different laboratory disciplines and feedback stating that they would.

'practise daily what I've learnt today!'

Prior to implementation of this project, EU hospital laboratories didn't collaborate on development of their locally delivered CPD activities despite the fact that they are significant providers of CPD activities for Biomedical Scientists. This project has initiated European co-operation for partner organisations, staff and employees and has brought together Biomedical Scientists and CPD providers from partner countries to work, learn and cooperate jointly. As such it has forged an intensive network of European collaboration of Biomedical Scientists and trainers who are all striving to harmonise their practice throughout the EU.

5. Conclusions

We conclude that implementation of this novel CPD activity on the topic of the clinical laboratory pre-analytical phase has been one of the key elements of this project which has served to intensify European biomedical science CPD, associations and partnerships. The project overall has had immense success in bringing together a European Community of Practice intent on fostering teamwork and building new working relationships within a network of European hospital laboratories.

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