

RESEARCH ARTICLE



Integrating a pedagogic course in a CPD programme for paediatricians at out-patient clinics

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ABSTRACT

Equipping paediatricians for the challenges of the explosive development of knowledge and specialised health care calls for a well-planned continuing professional development (CPD) strategy which updates paediatric competencies and the pedagogic skills among paediatricians. The purpose of the study was to evaluate the effects of a pedagogic course, integrated into a CPD programme for paediatricians at out-patient clinics. The pedagogic course comprised three learning components, participation in a CPD programme, during two and a half years, a pedagogic learning module and a pedagogic assignment. The objectives of all the learning activities, including the pedagogic course, were developed according to adult learning theories. Evaluations were made using questionnaires. Seventeen paediatricians participated in the CPD programme; 13 of them completed the pedagogic learning module and six the full pedagogic course, including the pedagogic assignment – teaching at one's own clinic. Evaluation of the pedagogic assignment at the participants' own clinics by 64 co-workers revealed that the co-workers appreciated the training activities and would recommend them to a colleague. We conclude that it is possible to combine medical and pedagogic education in a CPD programme for paediatricians and that the participants were able to digest and apply the pedagogic principles used in the course.

ARTICLE HISTORY

Received 22 October 2020

Revised 7 December 2020

Accepted 8 December 2020

KEYWORDS

Continuing professional development; Pedagogic course; General paediatrics; Adult learning theories

Background

The continuing professional development (CPD) of specialist doctors in Sweden has attracted increasing interest after the pharmaceutical industry and the Swedish Medical Association agreed that, from 2006, the pharmaceutical industry would reduce its sponsorship of medical training [1]. This agreement has resulted in increasing demands being imposed on employers to provide and create the scope for various CPD activities. In Sweden, CPD for specialist doctors is not mandatory, but there is a clear awareness that CPD activities need to be strengthened and an emerging discussion about how or in which form they should be run.

Until recently, medical education has often taken the form of traditional lectures [2] and the same thing applies to most CPD courses worldwide [3]. Nevertheless, pedagogic research has revealed that CPD courses based on modern principles of adult learning have far greater potential to change the clinical practice of doctors than traditional lectures [3,4].

In 2010, in our capacity as the directors of studies associated with the CPD of paediatricians in the Västra Götaland Region, we introduced a cohesive CPD programme aimed at

paediatric consultants on call [5,6]. The region has 1.6 million inhabitants, including 320,000 children below the age of 18 years. The two-year programme consisted of 19 so-called learning modules and an examination taken at home and was held on a total of 16 one-day sessions. The learning process for each learning module in the programme was based on modern principles of adult learning which can be summarised in four stages: 1) preparation, reading assignments, 2) the application of knowledge, active participation in case discussions or scenario training, 3) the assessment of learning, a written, group-based examination taken at home and 4) return to clinical practice. During the implementation of this on-call training, we found that paediatric physicians with responsibility for specific areas of knowledge within paediatrics were capable of assuming the role of formal educators in their individual areas of expertise and that the participants' experience and skills helped to create a powerful interactive learning environment [5,6]. From the evaluation of the subsequent on-call programmes, we understood that teachers and participants had implicitly taken part in *pedagogic education* and that they had also used the pedagogic model applied in the course in training activities at their individual workplaces. This observation inspired us going forward to attempt to formalise and

integrate pedagogic training in our CPD programmes. The concept of formalising the pedagogic training was initially tested and evaluated among teachers in a study of a two-day learning module entitled “Refugee children – with the emphasis on health examinations” [7].

In a new, cohesive CPD programme in general paediatrics and educational skills for senior paediatricians at out-patient clinics (*General paediatrics at the clinic*) we were planning to attempt to integrate a structured pedagogic course for the participants. In this study, we evaluate the pedagogic course in the new CPD programme and examine the potential for influencing the learning environment at the participants’ workplaces through pedagogic education.

Purpose of the Study

The purpose of the present study was to evaluate the effects of a pedagogic course, integrated into a CPD programme for paediatricians at out-patient clinics, from the participants’ as well as their co-workers’ perspective

Methods

Pedagogic Course

The objectives of the *Pedagogic course* were as follows:

After completing the full *Pedagogic course* you should be able to:

- identify the learning needs of the target group
- develop a clear and relevant description of the objective of the learning activity
- identify preparation material according to the description of the objective
- construct cases according to the description of the objective, including “key words”
- run a case-based group discussion
- give and receive feedback after a case discussion
- evaluate the learning activity

The pedagogic course in the programme comprised three learning components: A) participation in the *General paediatrics at the clinic* CPD programme, during a period of two and a half years, B) the *Pedagogic learning module* at the beginning of the CPD programme and C) the non-compulsory *Pedagogic assignment* at the end of the programme. A schematic illustration of the time of implementation of the learning components in the CPD programme is illustrated in Table 1.

A. Participation in the CPD Programme “General Paediatrics at the Clinic”

The CPD programme, *General paediatrics at the clinic*, with 17 participants, was aimed at experienced paediatricians with at least five years of clinical practice as specialists. The programme comprised a total of 19 learning modules (16 full days in all), including a pedagogic learning module and it was conducted over a period of two and a half years.

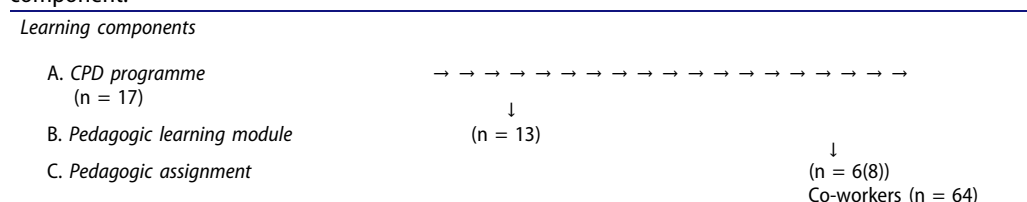
All the learning modules in the programme were conducted according to the same pedagogic principles previously defined for the course aimed at on-call paediatricians; this includes preparation, active participation, evaluation of the learning and return to clinical practice [5]. The participants in the CPD programme were thus exposed to the pedagogic approach and principles in the programme over a period of just over two years. Six participants also took part under the guidance of the directors of studies as teachers in their expert areas, together with the directors of studies and other relevant experts.

B. Pedagogic Learning Module

Objectives of the *Pedagogic learning module*:

After completing the *Pedagogic learning module*, you should have practised:

Table 1. Schematic illustration of the time of implementation of the learning components that was included in the pedagogical course. The horizontal arrows represent the different learning modules in the main CPD program and the numbers within brackets, the number of participants in each learning component.



- developing a clear and relevant description of the objectives of a learning activity
- constructing cases corresponding with the description of the objective
- running a group-based case discussion

The pedagogic learning module was held for just over half a day, as the fourth learning module in the CPD programme. Three weeks before the implementation of the learning module, the participants were given the following instructions and preparatory material:

Preparations Prior to the Pedagogic Learning Module

- Read the article entitled: *The difficult art of writing a good goal description* [8].
- All the participants are allocated to a group and a learning topic from the main course, *General paediatrics at the clinic*.
- Work together in a group and develop a proposal for a description of the objectives for the group's allocated learning topic.
- Watch the film: *Case Based Learning Overview* [9].

Each group prepared two short cases, with the group participants' clinical experience as the starting point. These cases were expected to highlight some aspect of the description of the objectives the group had formulated and should be suitable for use in group-based case discussions during the implementation of the pedagogic learning activity. All the participants were asked to be prepared to give brief presentations of the group's proposal for a description of the objectives.

Implementation of the Pedagogic Learning Module

A total of 13 participants took part in the implementation of the pedagogic learning module in the form of two group sessions:

Group session I – *Preparation of group-based case discussions*

At the start of the day, the participants presented their proposals for a description of the objectives for the allocated areas, developed their cases and prepared to run (lead) a group-based case discussion. The participants worked in four groups on the further development of their proposals for a description of the objectives for the allocated areas, one area per group: Obesity, Skin diseases, Nephrology and Infections.

The participants were encouraged to discuss the following questions: Does the case highlight the description of the objective? What aspects of the description of the objective are highlighted by the case? They were also told to consider when they need to solve a problem in the case. Examples of questions that can be used in the group-based case discussions were proposed, inspired by Skinner's: The "Diagnostic Odyssey" [10].

Group session II – *Implementation of group-based case discussions*

Towards the end of the day, the participants practised implementing and leading a group-based case discussion, with the cases and descriptions of objectives they had completed earlier in the day as their starting point. They were told to consider how to allocate the time to ensure that the participants in the group had enough time to discuss problems and options.

When running the group-based case discussions, the following approach was recommended:

- Presentation of cases and problems
- Participants working with the case and problems in small groups
- Expand the discussion to the large group by letting one of the groups explain how they solved the problem
- Stimulate a discussion between the groups
- Summarise the key points of the case and/or let the participants summarise what was most important in the case for them

The participants gave and received feedback from the course leaders (DH and PW) both during the training of construction of cases (group session I) and when they run their case-based group discussions (group session II).

C. Pedagogic Assignment – Teaching at Their Own Clinics

The pedagogic assignment was completed during the final six months of the main programme, *General paediatrics at the clinic*, which lasted just over two years. This meant that, at the time of implementation of the pedagogic assignment, all the participants had their own experiences of the pedagogic methods used in the main course, after participating actively in at least 15 medical learning modules. In addition, six participants had acted as formal teachers of the learning

modules in their individual areas of expertise during the main course.

Implementation of the Pedagogic Assignment – Teaching at One’s Own Clinic

Instructions prior to the implementation of the pedagogic assignment:

Take advantage of previous course material! Apply the basic pedagogic principles used during the main CPD programme. The use of the articles from the main CPD programme, as well as the principles for designing the objectives and the cases, is recommended.

- Select a subject and target group for your educational activity
- Formulate the description of the objectives
- Choose one to two preparatory articles
- Create a programme (subject, time and place)
- Distribute the programme, the objectives and preparatory articles to the target group and the directors of study
- Implement your group-based case discussion activity
- Evaluate your group-based case discussion activity using the questionnaire provided (Table 2)

Eight participants completed the pedagogic assignment at their own clinics and six of them presented a report in accordance with the instructions (correct evaluation form). Three of the participants who completed the pedagogic assignment had acted as formal teachers when one of the teaching modules on the main

programme was run but not on the same topics on which they ran training activities for their co-workers. Answers relating to the evaluation of the completed training were obtained from 64 co-workers, in all.

Results

Evaluation of the Pedagogic Learning Module

The evaluation was made immediately after the implementation of the learning module. All 13 participants responded to the following open questions *What were the three main strengths and weaknesses of the learning module?* The answers were categorised and thematised using qualitative content analysis with inductive approach [11].

The answers relating to the strengths of the learning module comprised a total of 13 items, which were transformed into themes in the following categories: *Formulating descriptions of objectives* (two), *Training in patient cases* (four), *Case discussions* (three) and *Working together in a group* (four). Answers relating to the weaknesses of the learning module comprised a total of six items, which were transformed into themes in the following categories: *Poor forward planning* (two), *Lack of time* (two) and *Somewhat unclear* (two).

The evaluation of the pedagogic learning module that was made by the participants through the questionnaire, corresponds to the lowest level (knows) of Millers “Framework for clinical assessment” [12] and the assessment of Group session II–*Implementation of group-based case discussions*, that was made by the

Table 2. Questionnaire used for the evaluation of the pedagogical assignment during the CPD programme for paediatricians at out-patient clinics.

Date: Topic:

PROFESSION

- ☐ Paediatrician ☐ Resident Paediatrician ☐ Intern Physician ☐ Other Physician:
- ☐ Specialist nurse ☐ Nurse ☐ Other profession:

GENERAL ASSESSMENT

1. How do you assess the training activity as a whole?	Very poor	1	2	3	4	5	6	Very good
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Would you recommend this training activity to a colleague in a situation similar to yours?	Not at all	1	2	3	4	5	6	Yes, definitely
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

DEVELOPMENT OF THE TRAINING ACTIVITY

3. What were the three main strengths and weaknesses of the training activity?

3a. Strengths:

3b. Weaknesses:

authors (DH and PW) through direct observation, corresponds to level two (knows how) and three (shows how).

Evaluation of the Pedagogic Assignment – Teaching at One's Own Clinic

Six participants completed and correctly evaluated their teaching activities at their own clinics. The teaching comprised the following subjects: Anaemia, Enuresis, Avoidant Restrictive Food Intake Disorder, Spirometry, Periodic fever and Ehlers-Danlos Syndrome. At the six clinics, a total of 64 co-workers participated: 26 doctors (13 paediatricians, one specialist in general medicine, six resident physicians focusing on paediatric medicine and three on general medicine, two registered physicians and one medical intern), 24 nurses (22 paediatric nurses and two registered nurses), two auxiliary nurses, three psychologists,

one dietitian and four medical secretaries. Four co-workers did not give their occupation.

To the questions: *How do you assess the training activity as a whole?* and *Would you recommend this training activity to a colleague in a situation similar to yours?* (scale 1–6, where one is very poor/not at all and 6 is very good/yes, definitely), the co-workers' answers produced a mean value of 5.8 [4–6] to both questions.

To the question: *What were the three main strengths of the training activity?* the co-workers named a total of 132 items and, to the question *What were the three main weaknesses of the training activity?*, the co-workers named 28 items. The answers were transformed into themes using qualitative content analysis with inductive approach [11] and categorised under the objectives set for knowledge after the implementation of the entire *Pedagogic course*, see Table 3.

The evaluation of the pedagogic assignment that was made by the co-workers through the questionnaire, corresponds, from the co-workers perspective, to the

Table 3. Co-workers' responses to the questions about the three main strengths and weaknesses of the training activities, transformed into under the objectives set for the entire pedagogic course.

Identify the learning needs of the target group	
Strengths	Weaknesses
Useful (7)	Short of time (9)
Relevant (9)	Not so deep (4)
Instructive (6)	
Interesting (7)	
Formulate the learning objectives	
Strengths	Weaknesses
Clear structure (6)	–
Develop a clear and relevant description of the objective of the learning activity	
Strengths	Weaknesses
Clear (9)	–
Understandable (5)	
Identify preparatory material according to the objective of the training activity	
Strengths	Weaknesses
Preparatory articles (10)	–
Video movie (2)	
Construct cases according to the objective of the training activity, including "key words"	
Strengths	Weaknesses
Patient cases (19)	More cases (1)
Case reports (2)	
Presentations (5)	
Run a case discussion activity	
Strengths	Weaknesses
Discussions (11)	A little unclear (2)
Group discussions (8)	Somewhat too fast (1)
Small group (3)	Sometimes hard to hear (1)
Give and receive feedback after a case discussion activity	
Strengths	Weaknesses
Summation (5)	Conclusion of case, missing (1)
Reflection (2)	Discussion of results (1)
Involvement (3)	Questions about participants' own tricky cases, missing (1)
Evaluate the training activity	
See (this table!)	
Categories that have not been sorted under any specific heading in the description of the objective of the training activity	
Strengths	Weaknesses
Pedagogy (9)	None (6)
Presentations (3)	Small text on the pictures (1)
Competent course leader (1)	

Figures within brackets represent the number of items included in each category.

lowest level (knows) of Millers “Framework for clinical assessment” [12] but may, from the perspective of the objectives of the entire pedagogic course, be seen as an evaluation of the participants teaching skills, thereby corresponding to level four (does).

A schematic illustration of the learning sessions and the evaluations included in the pedagogic course and the relationship to Millers “Framework for clinical assessment” is illustrated in Table 4.

Discussion

The field of medical knowledge has experienced explosive developments in recent decades and, among other things, this has resulted in investigations and treatment within health care becoming increasingly complex and specialised [13,14]. This means that specialist physicians, not least paediatricians, need to update their knowledge on a regular basis and be able to prioritise and find solutions to clinical problems both themselves and in collaboration with colleagues and co-workers in other occupational categories [15,16].

In Sweden, paediatricians at out-patient clinics work closely with nurses and other primary care professionals, such as psychologists and dietitians [17]. Of paediatricians working at out-patient clinics in Västra Götaland Region in 2015, about 65% stated that, besides the work at the out-patient clinic, this also included working at a Child Healthcare Centre and 37% said that it included working in the school health service (DH. Unpublished data).

Equipping paediatricians for these challenges calls for a well-planned CPD strategy which updates and strengthens not only their paediatric skills and expertise but also their pedagogic competence.

The CPD programme entitled “*General paediatrics at the clinic*” involved integrating a pedagogic course in

the programme to improve the pedagogic skills of paediatricians.

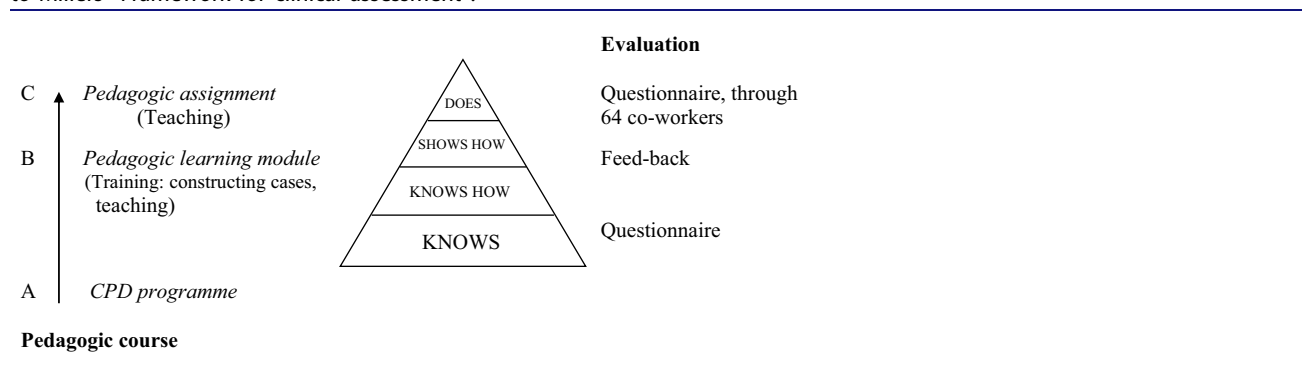
Participating in the CPD programme meant that the participants were exposed to the pedagogic methods and approaches applied in the programme which gave them the opportunity continuously to reflect on and discuss the pedagogics included in the programme. The participants conceptualised the actual pedagogic methods in the pedagogic course by formulating descriptions of objectives and developing cases, using these experiences as the starting point for practising leading group-based case discussions in a safe setting and, finally, running training at their own workplaces which was evaluated by their co-workers. In this way, the structure of the pedagogic teaching on the pedagogic course was linked to Kolb’s model for experience-based learning [18].

The results of the evaluation of the *Pedagogic learning module* reveal that the participants appreciated being able to practise formulating descriptions of objectives for their teaching activities, formulating cases and running group discussions. The participants teaching activities were observed and the participants were given feedback by the course leaders (DH and PW). Thus, the evaluation may correspond to level three (shows how) in Miller’s framework for assessing clinical competence [12].

No explicit evaluation of the participants’ competence as teacher was made before and after the completion of the pedagogical course, respectively. On the other hand, as the participants previously either lacked or had only limited experience of the form of teaching used on the course, the results indicate that they were prepared to change their way of teaching and to apply modern adult learning principles.

The identification of the learning needs of the co-workers was made on the basis of the participants’ own experiences and knowledge of their co-workers. The

Table 4. Schematic illustration of the learning components included in the pedagogic course, the evaluations and the relationship to Millers “Framework for clinical assessment”.



results of the evaluation of the participants' implementation of the *Pedagogic assignment* at their clinics reveal that the overwhelming majority of the co-workers appreciated the training activities and that they would recommend this training to a colleague. Virtually all the co-workers gave positive assessments of the training activities, even though there was a wide range of occupations in the profession. This may be explained by the fact that the learning needs of the co-workers were met and that, in our country, paediatricians at out-patient clinics are working in teams, in close collaboration with nurses and other primary care professionals and that they thereby are familiar with learning from one another [17].

The summary of the co-workers' answers to the question relating to the strengths of the training activities, illustrated in the categories of: *Preparatory articles*, *Group discussions*, *Reflection and Involvement*, see Table 3, indicated that the co-workers appreciated the opportunity to study in advance, that they valued the form of teaching with discussions and that they felt involved. The categories of *Usefulness*, *Relevant* and *Informative* also indicated that the co-workers learned something they could use in their work. The results of the evaluation shows that the objectives formulated for the pedagogic assignment were realised, but the results can also be seen as an evaluation of the entire pedagogic education during the pedagogic course. In this way, the results of the co-workers' evaluation of the participants' educational activities corresponds to the highest level (does) in Miller's framework for assessing clinical competence [12], see Table 4.

The results of the present study support our previous experiences which indicate that it is possible to combine medical and pedagogic education in a CPD programme for paediatricians [7]. The results of the evaluations of the pedagogic course indicate that the participants were able to digest and also apply the pedagogic principles used in the course. It is, however, too early to say whether the pedagogic education during the course has changed the participants' way of teaching in depth and over time [3,4,19].

Methodological Considerations

The planning of the main course contents was inspired by Kolb's circle for experience-based learning [18], while the evaluation of the learning modules was based on Miller's pyramid, which meant that the formulations of the objectives were associated with verbs rather than lists of what was going to be learned [4,12,19]. The concept of attempting to combine learning with the creation of collegial networks with a view

to influencing the learning environment in the region is linked to social learning theory [4].

The questions that were used in the evaluation of both the pedagogic learning module and the pedagogic assignment are not validated but have been used for more than 10 years to evaluate CPD courses for paediatric specialists in the region. They were originally used in a questionnaire designed to evaluate courses for doctors undergoing specialist training in Sweden.

The participants that completed and correctly evaluated their teaching activities at their own clinics were modest in number. On the other hand, the evaluation from an additional co-worker, using an incorrect evaluation form, revealed similar results. Furthermore, another three participants had acted as formal teachers when one of the teaching modules on the main course was run and the evaluations of their teaching activities were excellent and in line with the results of the evaluations of those teaching at their own clinics. The present CPD programme was demanding in relation to the time available for CPD activities for paediatricians working in out-patient clinics in our region. As a result, all the participants did not carry out the final, non-compulsory pedagogic assignment, at their clinics. We do not know the specific reason why some of the participants did not complete this learning session but we are considering making the pedagogic assignment compulsory in future CPD programmes. We have no reason to believe that the participants who did not complete the entire educational course differ in terms of pedagogic competence from those who did. For this reason, we do not believe that the results would have been significantly different if the number of participants completing the pedagogic assignment had been higher.

Conclusions

We conclude that the results of the present study indicate that it is possible to integrate pedagogic education in a CPD programme for paediatricians. Our approach including a pedagogic course in a CPD programme for specialist doctors is probably quite unique. We do not know of any other published study of a CPD programme that contains a formalised pedagogic education.

The results of the evaluation of the pedagogic course included in the programme indicate that the participants were able to digest and also apply the pedagogic principles used in the programme. Future research may reveal whether the pedagogic education has changed the participants' way of teaching in depth and over time and whether the pedagogic approach taught during the programme will be applied at clinics in the future and promote good learning environments and continuous learning.

Acknowledgments

We thank Emeritus Professor Ola Hjalmarsson for sharing his experience of teaching and learning methodology over many years prior to the start of the project and the participants for making the pedagogic course possible and for creating a fruitful learning environment during the two-and-a-half-year long CDP programme.

Disclosure Statement

The authors declare that they have no competing interests.

Funding

This work was supported by the Department of Research and Development, Västra Götaland Region, Sweden, through funding of research time for the Directors of Study, DH and PW.

Abbreviations

CPD: continuing professional development

Availability Of Data And Materials

The datasets used and/or analysed during the current study are available from the corresponding author in response to reasonable requests.

Authors' Contributions

D H made substantial contributions to the conception and design of the study, the acquisition of data and the analysis and interpretation of data. He drafted and revised the manuscript critically for important intellectual content. H V H was involved in administering all the course material for the learning modules on the web, during the entire CPD programme. She participated actively in the implementation of the pedagogic learning module. She made substantial contributions to the analysis and interpretation of data and was involved in the drafting of the manuscript and its critical revision for important intellectual content. P W made substantial contributions to the conception and design of the study, the acquisition of data and the analysis and interpretation of data. He contributed to drafting the manuscript and revising it critically for important intellectual content. All the authors are accountable for all aspects of the work and for ensuring that questions related to the accuracy or integrity of any part of the work have been appropriately investigated and resolved.

Ethical Approval

All the data collection was performed anonymously and informed consent was obtained from all the participants, as the response to the questionnaires was voluntary.

The study follows the ethical rules and principles applied by the healthcare services in the Västra Götaland Region and the Helsinki Declaration on research involving humans. The study has not been reviewed by the Regional Ethical Review

Board of Gothenburg, as the act relating to the Ethical Review of Research Involving Humans does not apply to the current study according to the assessment of an earlier similar study: Project ID: VGFOUREG-382851.

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