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Sources Searched: Medline, Embase, CINAHL, BNI

Cardiotocography Competency Assessment

See full search strategy

1. Comparison of High-Fidelity Simulation and Lecture to Improve the Management of Fetal Heart Rate Monitoring.

Author(s): Lee, Hsiu-Lan; Liu, Pei-Chi; Hsieh, Meng-Chen; Chao, An-Shine; Chiu, Ya-Wen; Weng, Yi-Hao

Source: Journal of Continuing Education in Nursing; Dec 2019; vol. 50 (no. 12); p. 557-562

Publication Date: Dec 2019

Publication Type(s): Academic Journal

Abstract: Background: We developed a training course of fetal monitoring using high-fidelity simulation for obstetric nurses. Method: All participants were assessed by two standardized written tests for knowledge and interpretation of fetal heart rate tracing before and after the training. In addition, a self-estimated questionnaire survey was performed twice—after the training and 6 months later. Results: The knowledge and interpretation of fetal heart rate tracing significantly improved in the simulation group. Compared with the lecture group, the perceived improvements of knowledge and interpretation of fetal heart rate tracing in the simulation group were significantly better following the training and 6 months later. Conclusion: High-fidelity simulation courses are useful in improving the knowledge and interpretation of fetal heart rate tracings for obstetric nurses. They are more effective to improve both short- and long-term management in fetal heart rate monitoring. High-fidelity simulation courses are useful in improving the knowledge and interpretation of fetal heart rate tracings for obstetric nurses. They are more effective to improve both short- and long-term management in fetal heart rate monitoring. [[J Contin Educ Nurs. 2019;50(12):557–562.]

Database: CINAHL

2. The impact of maternity training on knowledge, confidence, and empowerment: A mixed method pilot evaluation.

Author(s): Jomeen, Julie; Jones, Catriona; Martin, Colin R; Ledger, Sara; Hindle, Grace; Lambert, Carol

Source: Journal of evaluation in clinical practice; Jul 2019

Publication Date: Jul 2019

Publication Type(s): Journal Article

PubMedID: 31273915

Available at Journal of evaluation in clinical practice - from Wiley Online Library

Abstract:RATIONALE, AIMS, AND OBJECTIVESMaternity training is a critical global issue. In the United Kingdom (UK), the need for safer care and patient safety is emphasized through NHS policy. Health Education England (HEE) recommends that training should support a culture of continuous learning and improvement, particularly in the area of reducing the rates of stillbirths, neonatal and maternity deaths, and other adverse outcomes, such as intrapartum brain injuries. Training has been shown to play a crucial role in improving quality of care and reducing maternal and perinatal mortality and morbidity. This evaluation was undertaken to determine both the immediate and sustained impact of multiprofessional training in cardiotocograph (CTG) interpretation and community-based simulation training in obstetric emergencies: childbirth emergencies in the community (CEC). The impact was measured in terms of practitioner knowledge, confidence, and empowerment immediately pretraining and posttraining and at 12 weeks following training.METHODSA longitudinal mixed methods design was used. Attendees to maternity training sessions on cardiotocograph interpretation and management of childbirth emergencies in the community provided the sample. Quantitative data were collected using questionnaires to assess knowledge, confidence, and empowerment. Qualitative data were collected using open-ended questions embedded in the questionnaires. Quantitative data were analysed using within-subject t test to compare differences in the dependent variable measures. Qualitative data analysis was guided by Braun and Clarke (2013) method thematic analysis.RESULTSThe combined qualitative and quantitative results lucidly highlight that training positively impacts upon knowledge, confidence, and empowerment, an impact which is observed across three time points.CONCLUSIONSTraining in CTG and CEC is effective in improving knowledge, confidence, and empowerment across all groups. Furthermore, the provision of training packages in these subject areas facilitates improvements in the longer term.

Database: Medline

3. IMproving the practice of intrapartum electronic fetal heart rate MOnitoring with cardiotocography for safer childbirth (the IMMO programme): Protocol for a qualitative study

Author(s): Lame G.; Liberati E.; Burt J.; Dixon-Woods M.; Draycott T.; Winter C.; Ward J.

Source: BMJ Open; Jun 2019; vol. 9 (no. 6)

Publication Date: Jun 2019

Publication Type(s): Article

PubMedID: 31256041

Abstract: Introduction Suboptimal electronic fetal heart rate monitoring (EFM) in labour using cardiotocography (CTG) has been identified as one of the most common causes of avoidable harm in maternity care. Training staff is a frequently proposed solution to reduce harm. However, current approaches to training are heterogeneous in content and format, making it difficult to assess effectiveness. Technological solutions, such as digital decision support, have not yet demonstrated improved outcomes. Effective improvement strategies require in-depth understanding of the technical and social mechanisms underpinning the EFM process. The aim of this study is to advance current knowledge of the types of errors, hazards and failure modes in the process of classifying, interpreting and responding to CTG traces. This study is part of a broader research programme aimed at developing and testing an intervention to improve intrapartum EFM. Methods and analysis The study is organised into two workstreams. First, we will conduct observations and interviews in three UK maternity units to gain an in-depth understanding of how intrapartum EFM is performed in routine clinical practice. Data analysis will combine the insights of an ethnographic approach (focused on the social norms and interactions, values and meanings that appear to be linked with the process of EFM) with a systems thinking approach (focused on modelling processes, actors and their interactions). Second, we will use risk analysis techniques to develop a framework of the errors, hazards and failure modes that affect intrapartum EFM. Ethics and dissemination This study has been approved by the West Midlands - South Birmingham Research Ethics Committee, reference number: 18/WM/0292. Dissemination will take the form of academic articles in peer-reviewed journals and conferences, along with tailored communication with various stakeholders in maternity care.

Database: EMBASE

4. Improving intrapartum fetal monitoring interpretation and reducing harm at Sherwood Forest Hospitals NHS Foundation Trust

Author(s): Al-Samarrai S.; Bosworth K.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Mar 2019; vol. 126 ; p. 95

Publication Date: Mar 2019

Publication Type(s): Conference Abstract

Abstract: Objectives Launched in 2015, Each Baby Counts focuses on highlighting potentially avoidable intrapartum events. Intrapartum fetal monitoring plays a vital role, and training to recognise when babies are not coping with labour is required, instead of simplistic 'pattern recognition'. A cluster of CTG-related incidents in 2016 led to scrutiny of CTG training and development of a quality improvement initiative at Sherwood Forest Hospitals (SFH) to enhance the CTG training and situational awareness. Design/method In early 2017, SFH used money from the Maternity Safety Training Fund, to enable all midwifery and core medical staff to access physiologically based CTG training. Clinical leaders were also given the opportunity to attend advanced training sessions to cement that understanding. This training supported enhanced assessment and decision-making. Additionally, since 2016, annual local CTG training undertaken by all staff has focused on human factors, allowing better understanding of why incidents occur and ways their effects can be ameliorated. Results Since July 2017, there have been no reportable cases to Each Baby Counts at SFH and the overall HIE 1-3 rate in 2018 has dropped by 85% compared to 2016. (Table Presented) Conclusion This QIP runs alongside the development of an East Midlands intrapartum fetal monitoring guideline following concerns regarding the NICE intrapartum care guideline. SFH have been involved in developing this guideline alongside a competencybased assessment tool using fetal physiology as their basis, aiming to reduce variations in training and care delivered between Trusts.

Database: EMBASE

5. Changing from FIGO to physiological CTG interpretation: Implementation of staff training

Author(s): Knight C.; McMicking J.; Phipps L.; Napolitano L.; Lloyd J.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Mar 2019; vol. 126 ; p. 90-91

Publication Date: Mar 2019

Publication Type(s): Conference Abstract

Available at BJOG: An International Journal of Obstetrics and Gynaecology - from Wiley Online Library

Available at BJOG: An International Journal of Obstetrics and Gynaecology - from Unpaywall

Abstract: Objective To implement physiological CTG training for obstetricians and midwives, and collect data to assess impact of training. Design Difficulties with CTG interpretation are highlighted in national reports (RCOG Each Baby Counts; NHS Litigation Authority) and local Trust RCAs. Units using Physiological CTG Interpretation Guidelines have lower emergency CS and hypoxicischaemic encephalopathy rates compared with units using alternative guidelines. Method In April 2018, we arranged an introductory half-day multidisciplinary teaching session on CTG physiology. We then implemented weekly 60-minute CTG sessions led by a consultant/ ST6 + . We surveyed staff attending during a 6-week period to assess understanding and obtain qualitative feedback. Results 60% of staff responded including consultants, ST1-7, FY1-2, midwifery practice leaders, and midwives. Presession confidence was greater about FIGO (9% extremely, 49% confident, 34.5% somewhat, 7.5% not) compared with physiological interpretation (5.7%, 34.2%, 40.3%, 19.6%). Postsession confidence increased in physiological (36% strongly, 62% agree, 2% disagree) with almost all finding the session useful (39.5% extremely useful, 54.7% very useful, 5.7% somewhat useful, 0% not useful). Qualitative feedback enabled session modification: moving location to increase attendance, increasing senior presence, standardised introduction to physiological interpretation, discussing 1 case only, clear distinction between FIGO and physiological interpretation, case reflection including human factors. Conclusion A structured CTG training approach, using both familiar FIGO and new physiological guidelines, has improved staff confidence in physiological interpretation. Qualitative feedback enabled adjustments pertinent to our attendees' learning needs. We are continuing the weekly sessions and developing additional half-day annual sessions for all staff including formal knowledge testing.

Database: EMBASE

6. The effect of electronic fetal monitoring (EFM) education program on EFM interpretation skills

Author(s): Daglar G.; Demirel G.; Guler H.; Yurtsal B.

Source: Journal of Maternal-Fetal and Neonatal Medicine; 2018

Publication Date: 2018

Publication Type(s): Article In Press

Abstract: Purpose: The aim of this study is to train midwifery students on electronic fetal monitoring (EFM) within the scope of the course and then to evaluate their pre- and post-course EFM knowledge and EFM interpreting skills. Method(s): This interventional study was carried out at the Department of Midwifery, Faculty of Health Sciences. The study population comprised of the senior (last-year, 4th-year) students who attended the Midwifery Department of the Faculty of Health Sciences during the academic years 2015-2016 and 2016-2017. Of the 4th year students in the midwifery department, 42 who attended the school during the academic year 2015-16 and 61 who attended the school during the academic year 2016-2017 and accepted to participate in the study comprised the study sample. Result(s): The difference between the pre- and post-EFM course scores was statistically significant (p<.05). While the mean score obtained by the students before the EFM course was 55.29 +/- 11.17, it was 76.15 +/- 6.72 after the EFM course. Analysis of the success rates of the midwifery students in the EFM/NST course demonstrated that 80.6% of the students were successful. Conclusion(s): The findings of the study demonstrated that the participants' postcourse EFM knowledge and trace interpretation skills were better than their precourse EFM knowledge and trace interpretation skills.

Database: EMBASE

7. CTG training

Author(s): Hedditch, Anita

Source: Midwives; 2018; vol. 21 ; p. 74

Publication Date: 2018

Publication Type(s): General Information

Abstract:[...]we aim to add up to 12 real-life CTG case studies each year, all of which have been assessed by a group of experts who have provided a professional opinion of optimum management. The remaining CTG case studies are labelled 'learning cases', and provide a real-life source for the individual to practise their CTG analysis in a non-test environment. Users can be reassured that the knowledge sessions have been, and are being, written by expert clinicians in the field. eFM is not run as a business venture within the UK - its purpose is free education of a high quality. © Anita Hedditch is clinical project lead for eFM, and a senior midwife at Oxford University Hospital NHS Trust The aim is to provide a robust clinical grounding based on the most up-to-date sources available WHAT ARE THE PLANS FOR eFM IN 2018?

Database: BNI

8. Teaching childbirth with high-fidelity simulation. Is it better observing the scenario during the briefing session?

Author(s): Cuerva, Marcos J.; Piñel, Carlos S.; Espinosa, Jose A.; Martin, Lourdes; Corral, Octavio J.; Mendoza, Nicolás

Source: Journal of Obstetrics & Gynaecology; Jul 2018; vol. 38 (no. 5); p. 607-610

Publication Date: Jul 2018

Publication Type(s): Academic Journal

PubMedID: 29433368

Abstract: The design of optimal courses for obstetric undergraduate teaching is a relevant question. This study evaluates two different designs of simulator-based learning activity on childbirth with regard to respect to the patient, obstetric manoeuvres, interpretation of cardiotocography tracings (CTG) and infection prevention. This randomised experimental study which differs in the content of their briefing sessions consisted of two groups of undergraduate students, who performed two simulator-based learning activities on childbirth. The first briefing session included the observations of a properly performed scenario according to Spanish clinical practice guidelines on care in normal childbirth by the teachers whereas the second group did not include the observations of a properly performed scenario, and the students observed it only after the simulation process. The group that observed a properly performed scenario after the simulation obtained worse grades during the simulation, but better grades during the debriefing and evaluation. Simulator use in childbirth may be more fruitful when the medical students observe correct performance at the completion of the scenario compared to that at the start of the scenario. Impact statement What is already known on this subject? There is a scarcity of literature about the design of optimal high-fidelity simulation training in childbirth. It is known that preparing simulator-based learning activities is a complex process. Simulator-based learning includes the following steps: briefing, simulation, debriefing and evaluation. The most important part of high-fidelity simulations is the debriefing. A good briefing and simulation are of high relevance in order to have a fruitful debriefing session. What do the results of this study add? Our study describes a full simulator-based learning activity on childbirth that can be reproduced in similar facilities. The findings of this study add that high-fidelity simulation training in childbirth is favoured by a short briefing session and an abrupt start to the scenario, rather than a long briefing session that includes direct instruction in the scenario. What are the implications of these findings for clinical practice and/or further research? The findings of this study reveal what to include in the briefing of simulator-based learning activities on childbirth. These findings have implications in medical teaching and in medical practice.

Database: CINAHL

9. Development of a written assessment for a national interprofessional cardiotocography education program.

Author(s): Thellesen, Line; Bergholt, Thomas; Hedegaard, Morten; Colov, Nina Palmgren; Christensen, Karl Bang; Andersen, Kristine Sylvan; Sorensen, Jette Led

Source: BMC medical education; May 2017; vol. 17 (no. 1); p. 88

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28521768

Abstract:BACKGROUNDTo reduce the incidence of hypoxic brain injuries among newborns a national cardiotocography (CTG) education program was implemented in Denmark. A multiple-choice question test was integrated as part of the program. The aim of this article was to describe and discuss the test development process and to introduce a feasible method for written test development in general.METHODSThe test development was based on the unitary approach to validity. The process involved national consensus on learning objectives, standardized item writing, pilot testing, sensitivity analyses, standard setting and evaluation of psychometric properties using Item Response Theory models. Test responses and feedback from midwives, specialists and residents in obstetrics and gynecology, and medical and midwifery students were used in the process (proofreaders n = 6, pilot test participants n = 118, CTG course participants n = 1679).RESULTSThe final test included 30 items and the passing score was established at 25 correct answers. All items fitted a loglinear Rasch model and the test was able to discriminate levels of competence. Seven items revealed differential item functioning in relation to profession and geographical regions, which means the test is not suitable for measuring differences between midwives and physicians or differences across regions. In the setting of pilot testing Cronbach's alpha equaled 0.79, whereas Cronbach's alpha equaled 0.63 in the setting of the CTG education program. This indicates a need for more items and items with a higher degree of difficulty in the test, and illuminates the importance of context when discussing validity.CONCLUSIONSTest development is a complex and time-consuming process. The unitary approach to validity was a useful and applicable tool for development of a CTG written assessment. The process and findings supported our proposed interpretation of the assessment as measuring CTG knowledge and interpretive skills. However, for the test to function as a high-stake assessment a higher reliability is required.

Database: Medline

10. Reliability in cardiotocography interpretation - impact of extended on-site education in addition to web-based learning: an observational study.

Author(s): Gyllencreutz, Erika; Hulthén Varli, Ingela; Lindqvist, Pelle G; Holzmann, Malin

Source: Acta obstetricia et gynecologica Scandinavica; Apr 2017; vol. 96 (no. 4); p. 496-502

Publication Date: Apr 2017

Publication Type(s): Multicenter Study Journal Article Observational Study

PubMedID: 28052320

Abstract:INTRODUCTIONPrevious studies have shown poor reproducibility in cardiotocography (CTG) interpretation. Studies evaluating the Swedish web-based CTG-education program have not proven to increase accurate CTG assessments. The aim of this study was to evaluate whether an extended education can improve inter- and intra-observer reliability in CTG interpretation.MATERIAL AND METHODSSix obstetricians from two different departments interpreted 106 CTG tracings on two occasions. Both departments used a Swedish national web-based CTG education and test for training. One department had, in addition, an extended education program consisting of on-site lectures and oral examinations. Inter- and intra-observer agreements were calculated by simple or weighted kappa (κ) values for the five parameters assessed on CTG.RESULTSIn both departments inter-observer and intra-observer κ showed moderate to excellent agreement (ranges for κ 0.41-0.76 and 0.65-0.93, respectively). Obstetricians at the department with extended CTG education had better inter-observer reliability for variability and accelerations. This was also the case for intra-observer reliability with the addition of baseline frequency. Both inter- and intra-observer agreement increased from moderate to substantial in both departments when decelerations were dichotomized into harmless (including early and simple variable decelerations) or hypoxic (including late, severe variable, prolonged and combined decelerations) (κ 0.63-0.78) compared with the current sub-classification of decelerations (κ 0.42-0.65).CONCLUSIONSAgreement in CTG interpretation was better than expected in both departments, especially when divided into harmless/hypoxic changes. Combination of different learning methods (web-based, on-site lectures and case discussion) might result in a better CTG interpretation agreement compared with web-based learning solely.

Database: Medline

11. Effect of electronic fetal monitoring (EFM) education program on EFM interpretation skills of students

Author(s): Daglar G.; Demirel G.; Guler H.; Yurtsal Z.B.

Source: Journal of Maternal-Fetal and Neonatal Medicine; 2016; vol. 29 ; p. 170-171

Publication Date: 2016

Publication Type(s): Conference Abstract

Abstract: Introduction: Application to correct body part and correct trace interpretation are highly important in the emergence of benefits of electronic fetal monitoring (EFM) such as the reduction of intrapartum deaths. Implementation and interpretation of EFM are performed by health professionals especially by nurses/midwives. However, midwifery and nursing degree programs does not have the aim of gaining a qualification in EFM. Inadequacy of midwifery students' in this issue who will work in obstetrics services increases insufficient monitorings, wrong assessments and intervention possibilities. Monitoring and interpretation errors endanger the fetal health. For this reason, this study aims to evaluate EFM knowledge and interpretation skills of midwifery students' by educating them about EFM. Material(s) and Method(s): The sample of the research planned as an intervention study is consisted of voluntary 4th grade students studying between 2014-2016 years. Data were collected by pre-test (14 questions containing theoretical information, 10 trace paper), post-test (the same as the pre-test), Trace Interpretation Skills Criteria. Students also interpreted 10 more trace papers except that they interpreted in pre and post tests. At the end of the evaluation done by "Trace Interpretation Qualification Criteria", students who correctly interpreted 8 (80%) and more trace papers were considered as successful. Analysis of the data was tabulated by using average, standard deviation, percentage, paired t-test in SPSS (22.0) package program. Statistical significance was accepted as $p<0.05$. Clinical cases and summary results: All the 4th grade students participated in the study are female students (100%) and their average age is 22.56 +/- 2.11. The difference between student's scores they got before EFM education and after EFM education was found to be statistically significant ($p<0.05$). While students' point distribution was 55.29 +/- 11.17 before EFM education, after education it was found to be 76.15 +/- 6.72. When trace interpretation qualification criteria are examined, 96.1% of students' in determining basal/basic heart rate, 94.2% of them in assessing the long and short term variability, 87.4% of them in detecting accelerations and 80.6% of them were found to be sufficient in assessing decelerations and contractions. 80.6% of midwifery students' have been successful in EFM education. Conclusion(s): In accordance with these results, it can be said that, EFM education significantly increased the theoretical knowledge of students' and improved their trace interpretation skills.

Database: EMBASE

12. Developing a CTG simulator app: theory and practice.

Author(s): Ford, Jessica; Langley, Catherine; Molyneux, Adrian; Shelton, Clifford

Source: The clinical teacher; Dec 2016; vol. 13 (no. 6); p. 432-436

Publication Date: Dec 2016

Publication Type(s): Journal Article

PubMedID: 26525601

Available at The clinical teacher - from Wiley Online Library

Abstract:BACKGROUNDCardiotocograph (CTG) interpretation is a core skill for health care professionals working on the labour ward; however, training appears to be deficient in respect of the development of decision-making skills relating to CTG findings. Simulation offers a potential solution to address such 'human factors'. Current access to simulators is limited by cost and operational complexity. We therefore decided to develop an accessible CTG simulator application ('app') that could be operated on a smartphone, a technology already possessed by the majority of health care professionals in the UK and elsewhere. CTG interpretation is a core skill for health care professionals working on the labour ward CONTEXT: A multidisciplinary team with backgrounds in obstetrics, anaesthesia and information technology was assembled to undertake the software development process. An evaluation of the pilot software was undertaken by trainee obstetric doctors.INNOVATIONA software development project was undertaken in order to produce a mobile app that simulates CTG accurately and dynamically. This process was based on Davis' Technology Acceptance Model, in which usefulness and ease of use are the central principles.IMPLICATIONSMobile technology can be used to run simulation software that is both useful and easy to use; however, our evaluation indicated that in order to use the app effectively the operator requires some expertise in the behaviour of the CTG in response to interventions, in common with all current patient simulators. We envisage using this app in hybrid simulation scenarios, in which a live actor and a simulated monitor are used together.

Database: Medline

13. Training residents to be factually accurate and articulate: A case study using foetal heart rate monitoring nomenclature.

Author(s): Stohl, Hindi E; Miller, David A

Source: Journal of obstetrics and gynaecology : the journal of the Institute of Obstetrics and Gynaecology; Oct 2016; vol. 36 (no. 7); p. 954-956

Publication Date: Oct 2016

Publication Type(s): Journal Article

PubMedID: 27184212

Abstract: Careful communication between members of the obstetric team about intrapartum foetal heart rate is critical for clinical management and patient safety. This study evaluated the benefits of two testing modalities in assessing resident physician knowledge of the 2008 NICHD nomenclature. Multiple-choice (MC) and short-answer (SA) examinations were administered to Obstetrics and Gynecology resident physicians before an educational intervention and then immediately after the training, at 6 months and at 12 months. Test scores on both the MC and the SA examinations improved after the training session. The improvement was sustained over the course of the study. Residents performed higher on the MC examination than on the SA test. This study suggests that formalised teaching in foetal heart rate monitoring improves resident physician knowledge of the NICHD nomenclature and that SA examinations may better discriminate between residents who are and are not able to accurately articulate foetal heart rate monitoring terminology.

Database: Medline

14. Role of intensive physiology-based CTG training and mandatory competency testing to reduce the impact of the 'Human WORM' on poor perinatal outcomes

Author(s): Wijemanne A.; Chandraharan E.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Jun 2016; vol. 123 ; p. 199

Publication Date: Jun 2016

Publication Type(s): Conference Abstract

Available at BJOG: An International Journal of Obstetrics & Gynaecology - from Wiley Online Library

Abstract: Introduction The Human WORM is a useful tool to analyse the contribution of human factors to adverse incidents and includes errors of Workmanship (lack of knowledge and skills), Omissions (failure to incorporate clinical picture or to follow guidelines), Relationships (failures in communication and team working) and Mentorship (availability of and/or seeking senior input). Objectives To compare the frequency of human errors involved in cases of HIE before and after 2011 in a teaching hospital in London, when an intense physiology-based CTG training and mandatory competency based CTG testing was introduced to all staff. Methods Using a departmental database, cases of Hypoxic Ischaemic Encephalopathy (HIE) were identified. Formal Root Cause Analysis (RCA) investigations and case notes were reviewed for each case, and contribution of the Human WORM to each poor outcome was determined by both the reviewer and the supervising author independently, in order to eliminate bias. The period before the intervention (2009-2010) was compared to the period after the intervention (2011-2013). Results 26 cases of documented HIE were identified using the departmental database, between 2009 and 2013. Complete data were available for 23 cases. Human factors contributed to 21 out of the 23 cases (91.3%). The most common error of workmanship was CTG/STAN misinterpretation. This error occurred in 6 (26.1%) cases; 4 (66.7%) of these were between 2009 and 2010. The main errors of omission were delays in actions or reviews relating to fetal heart rate interpretation in 9 (39.1%) cases; 6 (66.7%) of these occurred between 2009 and 2010. Conclusion Human factors (WORM), especially shortcomings in workmanship and omissions, contribute significantly towards cases of poor neonatal outcomes. This study demonstrates a reduced frequency of errors relating to intrapartum fetal heart rate interpretation following an intensive physiology-based CTG interpretation and the introduction of a mandatory competency testing for all staff.

Database: EMBASE

15. Time to optimise and enforce training in interpretation of intrapartum cardiotocograph.

Author(s): Ugwumadu, A; Steer, P; Parer, B; Carbone, B; Vayssiere, C; Maso, G; Arulkumaran, S

Source: BJOG: An International Journal of Obstetrics & Gynaecology; May 2016; vol. 123 (no. 6); p. 866-869

Publication Date: May 2016

Publication Type(s): Academic Journal

PubMedID: 26773808

Available at BJOG : an international journal of obstetrics and gynaecology - from Wiley Online Library

Available at BJOG : an international journal of obstetrics and gynaecology - from Unpaywall

Abstract: The authors discuss the optimisation and enforcement of training in the interpretation of monitoring the intrapartum of the fetal heart rate (FHR) with cardiotocograph (CTG). Topics include the need for obstetrics and gynaecology profession to understand CTG interpretation and focus on recognition of normal and abnormal CTG, the development of the electronic learning (e-learning) by medical device company Neoventa Medical AB, and the domains of the CTG validity tests.

Database: CINAHL

16. A credentialing test for EFM.

Author(s): NAGEOTTE, MICHAEL P.; TOMLINSON, MARK W.; O'KEEFE, MARIN

Source: Contemporary OB/GYN; May 2016; vol. 61 (no. 5); p. 19-22

Publication Date: May 2016

Publication Type(s): Academic Journal

Available at Contemporary OB/GYN - from ProQuest (Health Research Premium) - NHS Version

Abstract: The article presents an overview of the credentialing test of the Perinatal Quality Foundation (PQF), a new method to assess the knowledge and competence of a provider with electronic fetal heart rate monitoring (EFM) to improve outcomes. Topics discussed include traditional knowledge type of questions to test knowledge of EFM nomenclature and definitions, questions based on script concordance theory (SCT), and exam focus areas like identification of fetal heart rate (FHR) components.

Database: CINAHL

17. Assessment of an e-learning training program for cardiotocography analysis: a multicentre randomized study.

Author(s): Carbonne, Bruno; Sabri-Kaci, Imène

Source: European journal of obstetrics, gynecology, and reproductive biology; Feb 2016; vol. 197 ; p. 111-115

Publication Date: Feb 2016

Publication Type(s): Randomized Controlled Trial Multicenter Study Journal Article

PubMedID: 26720599

Abstract:OBJECTIVETo assess the improvement of knowledge in cardiotocography (CTG) analysis, with the use of a dedicated e-learning program.STUDY DESIGNMulticentre randomized controlled trial conducted in 5 maternity departments of Eastern-Paris Perinatal network. Midwives and obstetricians were recruited on a voluntary basis. At first log-in, they were tested on CTG interpretation and on labor management. They were then randomly allocated to a "training" group (n=57) with the e-learning program, or to a "no-training" group (n=56). After three months, a second test was performed. Mean scores at first and second tests, rate of participants in the bottom quartile, and mean scores between doctors and midwives were compared between "training" and "no-training" groups.RESULTSSeventy-five midwives and 38 obstetricians participated in the study. The mean scores at first test were similar in both groups (32.4 ± 5.2 out of 50 and 32.5 ± 4.6, p=0.989). After e-learning, the results were significantly higher in the "training" group than in the "no-training" group (mean 37.1 ± 5.5 vs. 32.6 ± 5.7, respectively; p=0.0026). The number of participants in the bottom quartile reached 36.0% in the "no-training" group, while it decreased to 12.6% in the "training" group (p=0.032). Doctors had higher results than midwives in the first test (34.9 ± 5.9 vs. 32.4 ± 4.3; p=0.0048), but not in the second test in the group with training (37.7 ± 6.7 vs. 36.8 ± 4.8; p=0.64).CONCLUSIONTraining in CTG interpretation using an e-learning program improves the performance of obstetric staff. The possibility of logging-in from any place at any time may favor the use of an e-learning program in maternity staff.

Database: Medline

18. Use of a Mobile Device Simulation as a Preclass Active Learning Exercise

Author(s): Keegan, Robert D; Oliver, M Cecile; Stanfill, Teresa J; Stevens, Kevin V; Brown, Gary R; Ebinger, Michael; Gay, John M

Source: Journal of Nursing Education; Jan 2016; vol. 55 (no. 1); p. 56-59

Publication Date: Jan 2016

Publication Type(s): Article

Available at Journal of Nursing Education - from ProQuest (Health Research Premium) - NHS Version

Abstract: Research shows that preclass activities introducing new material can increase student performance. In an effort to engage students in an active learning, preclass activity, the authors developed a mobile application. Eighty-four nursing students were assigned a preclass reading exercise, whereas 32 students completed the preclass simulation scenario on their mobile device. All students completed the same electronic fetal monitoring (EFM) quiz 1 week following the lecture. The effects of reading or simulation on student quiz performance was evaluated with a student's paired t test, using an alpha of .05. Students completing the preclass simulation scored higher on the EFM quiz, compared with students assigned the preclass reading (85% versus 70% correct answers, p = .01). Student survey data indicated that the mobile device simulation was perceived as an engaging and desirable instructional tool. Nursing students completing the mobile device EFM preclass simulation outperformed the students who were given the traditional reading assignment.

Database: BNI

19. Impact of a aphysiology-based "predictive" CTG trainining on the knowledge of types of intrapartum fetal hypoxia amongst midwives and obstetricians

Author(s): Gracia-Perez-Bonfils A.; Chandraharan E.

Source: Journal of Perinatal Medicine; Oct 2015; vol. 43

Publication Date: Oct 2015

Publication Type(s): Conference Abstract

Available at Journal of Perinatal Medicine - from Unpaywall

Abstract: Brief Introduction Intrapartum hypoxia is one of the main contributors to perinatal morbidity and mortality and to persistent neurological impairment. In the absence of any pre-existing damage to the central nervous system, a fetus would exhibit a series of predictable changes on the CTG Trace in response to an evolving intrapartum hypoxic stress that have been classified into acute, subacute or a gradually evolving hypoxia. Physiology-based "predictive" CTG Interpretation involves use of fetal physiology to understand the mechanisms behind the features observed on the CTG Trace and to determine the fetal response to hypoxic stress as well as to predict the next change on the CTG Trace so as to improve perinatal outcomes. Objective The aim of this study was to determine the knowledge of types of intrapartum hypoxia among midwives and obstetricians at the Pre-test, and to assess the impact of the physiology-based, "predictive" CTG Training on this knowledge as assessed by the Post Test. Materials and Methods Pre and Post Test results of a total group of 810 midwives and obstetricians who attended CTG Masterclasses in 15 Centres in the United Kingdom between January 2013 and September 2014 were analysed. Pre test (prior to the commencement of training) and Post Test (at the end of training) comprised the same questions about various types of intrapartum hypoxia on the CTG. Independent categorical variables were compared using the Chi-square test, and the Bonferroni correction was applied for multiple comparisons. The change in the proportion of correct answers was calculated using the McNemar's test for paired data. A two-tailed p value of < 0.05 was considered statistically significant. Summary

Results Only 25.1% of midwives and 30.1% of obstetricians correctly answered the questions that tested their knowledge of pathophysiology of intrapartum hypoxia during the Pre Test. After intensive training, the proportion of right answers increased to 91.1% and 90.6%, respectivelly. Therefore, the proportion of improvement was 68.2% in midwives and 60.6% in obstetricians ($p<0.01$). Conclusions Less than a third of the 810 delegates were able to correctly answer questions pertaining to the types of intrapartum hypoxia. Intensive fetal physiology based, "predictive" CTG Testing significantly improved the knowledge of types of intrapartum hypoxia and fetal response to hypoxic or mechanical stress during labour. Therefore, we recommend this intense 'physiology based, "predictive" CTG training to reduce unnecessary intrapartum interventions and to improve perinatal outcomes as opposed to the traditional "pattern-based" CTG Training.

Database: EMBASE

20. Curriculum development for a national cardiotocography education program: a Delphi survey to obtain consensus on learning objectives.

Author(s): Thellesen, Line; Hedegaard, Morten; Bergholt, Thomas; Colov, Nina P; Hoegh, Stinne; Sorensen, Jette L

Source: Acta obstetricia et gynecologica Scandinavica; Aug 2015; vol. 94 (no. 8); p. 869-877

Publication Date: Aug 2015

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

PubMedID: 25891290

Available at Acta obstetricia et gynecologica Scandinavica - from Wiley Online Library

Abstract:OBJECTIVETo define learning objectives for a national cardiotocography (CTG) education program based on expert consensus.DESIGNA three-round Delphi survey.POPULATION AND SETTINGOne midwife and one obstetrician from each maternity unit in Denmark were appointed based on CTG teaching experience and clinical obstetric experience.METHODSFollowing national and international guidelines, the research group determined six topics as important when using CTG: fetal physiology, equipment, indication, interpretation, clinical management, and communication/responsibility. In the first Delphi round, participants listed one to five learning objectives within the predefined topics. Responses were analyzed by a directed approach to content analysis. Phrasing was modified in accordance with Bloom's taxonomy. In the second and third Delphi rounds, participants rated each objective on a five-point relevance scale. Consensus was predefined as objectives with a mean rating value of ≥ 3.MAIN OUTCOME MEASURESA prioritized list of CTG learning objectives.RESULTSA total of 42 midwives and obstetricians from 21 maternity units were invited to participate, of whom 26 completed all three Delphi rounds, representing 18 maternity units. The final prioritized list included 40 objectives. The highest ranked objectives emphasized CTG interpretation and clinical management. The lowest ranked objectives emphasized fetal physiology. Mean ratings of relevance ranged from 3.15 to 5.00.CONCLUSIONSNational consensus on CTG learning objectives was achieved using the Delphi methodology. This was an initial step in developing a valid CTG education program. A prioritized list of objectives will clarify which topics to emphasize in a CTG education program.

Database: Medline

21. Impact of fetal ECG (STAN) and competency based training on intrapartum interventions and perinatal outcomes at a teaching hospital in London: 5 year analysis

Author(s): Chandraharan E.; Lowe V.; Ugwumadu A.; Arulkumaran S.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Jun 2013; vol. 120 ; p. 428-429

Publication Date: Jun 2013

Publication Type(s): Conference Abstract

Available at BJOG: An International Journal of Obstetrics & Gynaecology - from Wiley Online Library

Abstract: Background St. George's Maternity Unit employs fetal electrocardiograph (ECG) using ST-Analyser (STAN) for intrapartum fetal monitoring. Intensive training for midwives and obstetricians was commenced in 2007 and a mandatory competency test for all staff in intrapartum fetal monitoring was introduced in 2010. In addition, all obstetric trainees were provided with hands-on one to one training in instrumental vaginal birth at their induction from 2009. Objectives To determine the impact of fetal ECG (ST-Analyser) and intensive training in fetal monitoring and instrumental vaginal delivery and mandatory competency testing on intrapartum interventions and perinatal outcomes over a 5 year period (2008-2012). Methods Maternity dashboards were analysed for the 5 year period from 2008 to 2012. Emergency caesarean sections, failed instrumental vaginal birth, hypoxic ischaemic encephalopathy (HIE) and early neonatal death (NND) rates were compared between 2008 and 2009 and 2010-2012 (after intensive training and mandatory competency test were introduced). Fisher's Exact Test was used to compare the two groups and Odds Ratio (OR) with 95% CI and Pvalues were calculated from Piece-wise logistic regression. Results Despite increasing in number of births over the 5 year period (2008-2012), emergency caesarean section rate decreased from 15% in 2008 to 9% in 2012, failed instrumental vaginal delivery from 0.77% in 2008 to 0.71% in 2012, HIE from 1.2/1000 in 2008 to 1.1/1000 in 2012, NND from 1.7/1000 in 2008 to 1.3/ 1000 in 2012. Compared to the period 2008-2009, there was a statistically significant difference in emergency caesarean sections ($P < 0.0001$) and failed instrumental vaginal delivery ($P = 0.012$) during 2010-2012. Conclusion Our 5-year trend analysis shows that use of fetal ECG (STAN) with intensive training and mandatory competency testing has significantly reduced our intrapartum caesarean sections and failed instrumental vaginal rate over the last 5 years. There was a statistically significant reduction in these parameters after intensive training and mandatory competency testing with continued use of fetal ECG. Although, the reduction in HIE and NND were not statistically significant, our maternity unit currently has a very low HIE rate (1.1/1000) despite increasing number and complexity of births and also has the lowest caesarean section rate in London (pan London caesarean section rate = 29%). Recommendation We strongly recommend the use of fetal ECG (STAN) to reduce false positive rate of cardiotocograph (CTG) and intensive training in fetal monitoring and operative vaginal delivery coupled with a mandatory competency testing to reduce the rate of emergency caesarean sections and failed instrumental vaginal delivery.

Database: EMBASE

22. The impact of a computer assisted learning programme on the ability to interpret cardiotochography. A before and after study.

Author(s): Millde-Luthander, C; Högberg, U; Nyström, M E; Pettersson, H; Wiklund, I; Grunewald, C

Source: Sexual & reproductive healthcare : official journal of the Swedish Association of Midwives; Mar 2012; vol. 3 (no. 1); p. 37-41

Publication Date: Mar 2012

Publication Type(s): Research Support, Non-u.s. Gov't Randomized Controlled Trial Journal Article

PubMedID: 22325800

Abstract:OBJECTIVETo evaluate if a computer assisted learning programme could bring about a higher degree of individuals who correctly classified cardiotochography (CTG) recordings in a non-selected population of midwives and physicians.STUDY DESIGNA before and after study.SETTINGSödersjukhuset, Stockholm, Sweden.SUBJECTSOne hundred and thirty midwives and 49 physicians at the maternity unit, September 2009-April 2010. A computer assisted learning programme for interpreting CTG patterns has been created. All 179 individuals included made the first interpretation and the 135 individuals also completing the education made the second interpretation. A third randomly selected interpretation was performed immediately following the second; permitting two participants to classify a CTG together. Comparison between the before and after-test was based on the Fisher exact test.MAIN OUTCOME MEASUREThe proportion of individuals who correctly classified CTGs before and after the training.RESULTSSixty four percentage of the individuals classified the CTGs correctly before and 66% after the training (P=0.76). There was no difference between the two professional groups. Normal CTGs were correctly identified by 36% of the individuals before and in 80% after the training (P=0.065). Corresponding figures for pathological CTGs were 83% and 85% (P=1.00), respectively.CONCLUSIONWe found no improvement in the proportion of individuals who classified CTGs correctly after the completion of a computer assisted learning programme in fetal monitoring. The baseline level of competence was higher than expected.

Database: Medline

23. Evaluation and impact of cardiotocography training programmes: a systematic review.

Author(s): Pehrson, C; Sorensen, J L; Amer-Wåhlin, I

Source: BJOG : an international journal of obstetrics and gynaecology; Jul 2011; vol. 118 (no. 8); p. 926-935

Publication Date: Jul 2011

Publication Type(s): Journal Article Review Systematic Review

PubMedID: 21658193

Available at BJOG : an international journal of obstetrics and gynaecology - from Wiley Online Library

Abstract:BACKGROUNDThe interpretation and management of cardiotocography (CTG) tracings are often criticised in obstetric malpractice cases. As a consequence, regular CTG training has been recommended, even though little is known about the effect of CTG training.OBJECTIVESTo perform a systematic review of the existing literature on studies on CTG training in order to assess educational strategies, evaluation of training programmes, and impact of training programmes.SEARCH STRATEGYThe Medline database was searched to identify studies describing and/or evaluating CTG training programmes. The literature search resulted in 409 citations.SELECTION CRITERIATwenty studies describing and evaluating CTG training programmes were included. There was no restriction on study design.DATA COLLECTION AND ANALYSISData regarding study design, study quality, educational strategies used for training in CTG interpretation and decision making, target groups, number of participants, methods used for evaluation, quality of evaluation, level of evaluation and results of training was extracted from 20 articles, and analysed using Kirkpatrick's four-level model for the evaluation of education.MAIN RESULTSTraining was associated with improvements on all Kirkpatrick levels, resulting in increased CTG knowledge and interpretive skills, higher interobserver agreement, better management of intrapartum CTG, and improved quality of care. Computer-based training (CBT) might be less time-consuming than classroom teaching. Clinical skills seem to decrease faster than theoretical knowledge.AUTHOR'S CONCLUSIONSTraining can improve CTG competence and clinical practise. Further research on CBT, test-enhanced learning and long-term retention, evaluation of training and impact on clinical outcomes is recommended.

Database: Medline

24. The e-learning revolution in obstetrics and gynaecology

Author(s): Jones O.; Saunders H.; Mires G.

Source: Best Practice and Research: Clinical Obstetrics and Gynaecology; Dec 2010; vol. 24 (no. 6); p. 731-746

Publication Date: Dec 2010

Publication Type(s): Review

PubMedID: 20655808

Available at Best practice & research. Clinical obstetrics & gynaecology - from Patricia Bowen Library & Knowledge Service West Middlesex University Hospital NHS Trust (lib302631) Local Print Collection [location] : Patricia Bowen Library and Knowledge Service West Middlesex university Hospital.

Abstract: The explosion of information technology has created new opportunities and tools to assist the trainee in the process of learning. This chapter describes how the Royal College of Obstetricians and Gynaecologists (RCOG) is embracing the opportunities provided by this technology to create interactive and engaging learning programmes designed to support trainees in achieving the knowledge, skills and attitudes required to practise. It considers how the RCOG has developed a number of online initiatives to support training, the drivers for doing so and presents some ideas for future developments.

Database: EMBASE

25. Using Peer Review to Measure Competence in Fetal Heart Monitoring Practice.

Author(s): Davis, Jocelyn; Kenny, Tiffany; Doyle, Jennifer L.; Copeland, Donna; Wigle, Nancy

Source: JOGNN: Journal of Obstetric, Gynecologic & Neonatal Nursing; Sep 2010; vol. 39

Publication Date: Sep 2010

Publication Type(s): Academic Journal

Database: CINAHL

26. A 'buddy' approach to CTG.

Author(s): Fitzpatrick, T; Holt, L

Source: Midwives; 2008; vol. 11 (no. 5); p. 40-41

Publication Date: 2008

Publication Type(s): Article

Abstract: The use of the buddy system in Leeds Teaching Hospitals' maternity units in order to improve cardiotocograph (CTG) interpretation skills while monitoring the fetus during childbirth. [(BNI unique abstract)] 4 references

Database: BNI

27. Multidisciplinary teamwork approach in labor and delivery and electronic fetal monitoring education: a medical-legal perspective.

Author(s): Collins, Dawn E

Source: The Journal of perinatal & neonatal nursing; 2008; vol. 22 (no. 2); p. 125-132

Publication Date: 2008

Publication Type(s): Journal Article

PubMedID: 18496072

Available at The Journal of perinatal & neonatal nursing - from Ovid (LWW Total Access Collection 2019 - with Neurology)

Abstract: In recent years, reports of the increasing number of preventable medical errors have stimulated the healthcare delivery system to develop and implement programs to improve patient safety. Many of these medical errors become the impetus for malpractice lawsuits brought against healthcare givers. In light of the large number of cases that involve electronic fetal monitoring issues, this article reviews many of the claims involved in those malpractice cases and some of the pitfalls encountered in defense of those claims. Because many of the adverse outcomes in perinatal units are because of miscommunications, it is imperative that a "team training" approach be utilized in the education of and communication among obstetrical caregivers. Borrowing from the successful strategy of Crew Resource Management in the aviation industry, this team training approach has been applied in the labor and delivery area and in some cases resulted in fewer adverse outcomes, and thereby a decrease in malpractice claims.

Database: Medline

28. A randomised-controlled trial evaluating a fetal monitoring education programme.

Author(s): Devane, Declan; Lalor, Joan G

Source: Midwifery; Dec 2006; vol. 22 (no. 4); p. 296-307

Publication Date: Dec 2006

Publication Type(s): Research Support, Non-u.s. Gov't Randomized Controlled Trial Controlled Clinical Trial Journal Article

PubMedID: 16876921

Available at Midwifery - from Patricia Bowen Library & Knowledge Service West Middlesex University Hospital NHS Trust (lib302631) Local Print Collection [location] : Patricia Bowen Library and Knowledge Service West Middlesex university Hospital.

Abstract:OBJECTIVEto evaluate the effectiveness of a fetal monitoring education programme on midwives' fetal monitoring knowledge and intrapartum cardiotocograph interpretation skills.DESIGNtwo group, before-after, randomised-controlled trial.SETTINGtwo maternity hospitals in the Republic of Ireland.PARTICIPANTS55 midwives were randomly assigned to either the experimental group (n=27) or the control group (n=28).INTERVENTIONSthe experimental group participated in a 1.5 hr fetal monitoring education programme, whereas the control group attended an alternative education programme consisting of a non-fetal-monitoring-related video presentation.MEASUREMENTSthe primary outcomes of interest were fetal monitoring knowledge and intrapartum cardiotocograph interpretation skills test.FINDINGSin the fetal monitoring knowledge post-test, the median percentage correct responses for the control and experimental groups were 56% (IQR 18.75) and 88% (IQR 12.5), respectively. This difference, 31.2%, was statistically significant (U=78.5, 95.1% CI -31.25 to -18.75, p<0.001). In the intrapartum cardiotocograph interpretation skills post-test, the median percentage correct responses for the control and experimental groups were 55.6% (IQR 16.7) and 66.7% (IQR 22.2), respectively. This

difference, of 11.1%, was statistically significant (U=186, 95.2% CI -16.67 to -5.56, p<0.001).KEY CONCLUSIONS AND IMPLICATIONS FOR PRACTICEattendance at a short (1.5 hr), in-service fetal monitoring education programme can increase midwives' fetal monitoring knowledge and cardiotocograph interpretation skills. The availability of in-service fetal monitoring education programmes is sporadic, often less than recommended, and is a cause for concern.

Database: Medline

29. Training and competency assessment in electronic fetal monitoring: A national survey

Author(s): Murphy A.A.; Halamek L.P.; Lyell D.J.; Druzin M.L.

Source: Obstetrics and Gynecology; Jun 2003; vol. 101 (no. 6); p. 1243-1248

Publication Date: Jun 2003

Publication Type(s): Article

PubMedID: 12798531

Available at Obstetrics and gynecology - from Ovid (Journals @ Ovid) - London Health Libraries

Abstract:OBJECTIVE: To investigate current patterns of training and competency assessment in electronic fetal monitoring (EFM) for obstetrics and gynecology residents and maternal-fetal medicine fellows. METHOD(S): A questionnaire was mailed to the directors of all 254 accredited US residencies in obstetrics and gynecology and 61 accredited US fellowships in maternal-fetal medicine. Questions focused on the methods used for teaching and assessing competency in EFM. RESULT(S): Two hundred thirty-nine programs (76%) responded to the survey. Clinical experience is used by 219 programs (92%) to teach EFM, both initially and on an ongoing basis. Significantly more residencies than fellowships use written materials and lectures to teach EFM. More than half of all programs require trainees to participate in some type of EFM training at least every 6 months; 23 programs (10%) have no requirement at all. Subjective evaluation is used by 174 programs (73%) to assess competency in EFM. Written or oral examinations, skills checklists, and logbooks are used exclusively by residencies as means of competency assessment. Two thirds of all programs assess EFM skills at least every 6 months; 40 programs (17%), the majority of which are fellowships, have no formal requirement. CONCLUSION(S): Most US training programs use supervised clinical experience as both their primary source of teaching EFM and their principal competency assessment tool. Residencies are more likely to have formal instruction and assessment than are fellowships. Few programs are using novel strategies (eg, computers or simulators) in their curriculum. © 2003 by The American College of Obstetricians and Gynecologists.

Database: EMBASE

30. Knowledge and skills of CTG interpretation.

Author(s): Stewart J; Guildea ZE

Source: British Journal of Midwifery; Aug 2002; vol. 10 (no. 8); p. 505-508

Publication Date: Aug 2002

Publication Type(s): Academic Journal

Available at British Journal of Midwifery - from MAG Online Library - Intermid

Available at British Journal of Midwifery - from Patricia Bowen Library & Knowledge Service West Middlesex University Hospital NHS Trust (lib302631) Local Print Collection [location] : Patricia Bowen Library and Knowledge Service West Middlesex university Hospital.

Abstract: The aim of this study was to assess how midwives acquired their knowledge and skills in cardiotocograph (CTG) interpretation, how confident they felt in this area and whether they considered they would benefit from additional training. The study design involved a survey conducted in 1999, of 1500 midwives practising in Wales. A total of 741 questionnaires were returned, representing a response rate of 49%. It was found that levels of confidence in their CTG interpretation skills are high, even those midwives who spent little time working on labour ward rated their expertise highly. The most popular methods of learning were study days, learning from experienced colleagues and reflective practice. However, 94% of respondents felt that training was insufficient and that more should be provided, particularly during work time and at no personal cost. This view is mirrored by a recent national survey conducted to examine the provision of CTG education which found that many midwives were using both their own time and money to attend relevant training (CESDI, 2000).

Database: CINAHL

31. Using telemedicine to facilitate training in cardiotocography (CTG) interpretation.

Author(s): Morris, D G

Source: Journal of telemedicine and telecare; 2000; vol. 6

Publication Date: 2000

Publication Type(s): Journal Article

PubMedID: 10793972

Abstract: Electronic fetal monitoring is a controversial practice in modern obstetric care and is frequently an aspect of medicolegal cases involving the management of labour and delivery. The interpretation of the cardiotocograph (CTG) produced by such monitors is a skill required by those caring for the pregnant woman. Studies have shown that most 'experts' do not interpret CTGs in a consistent manner, when compared with either other experts or themselves. However, it has also been shown that consistency can be improved with training. Telemedicine has been used to advantage in the training of obstetrics and gynaecology registrars in CTG interpretation.

Database: Medline

32. The development and evaluation of a computer-assisted teaching programme for intrapartum fetal monitoring.

Author(s): Beckley, S; Stenhouse, E; Greene, K

Source: BJOG : an international journal of obstetrics and gynaecology; Sep 2000; vol. 107 (no. 9); p. 1138-1144

Publication Date: Sep 2000

Publication Type(s): Research Support, Non-u.s. Gov't Randomized Controlled Trial Clinical Trial Journal Article

PubMedID: 11002958

Abstract:OBJECTIVEThe development and evaluation of a computer-assisted teaching programme of cardiotocography and acid-base balance.DESIGNRandomised controlled trial.PARTICIPANTSOne hundred and seventeen midwifery and obstetric staff at Derriford Hospital, Plymouth.METHODSThe obstetricians and midwives were randomly allocated to use the teaching programme, either early or late. The late group (control) used the teaching programme three months after the early group. To assess the effect of the teaching programme, participants were tested on four occasions over eight months by a multiple choice questionnaire. Two questionnaires on ease of use were also completed.MAIN OUTCOME MEASURESMultiple choice questionnaire scores and opinion questionnaire results.RESULTSThe mean score in the early group improved from 50-8% (test 1, pre-teaching programme) to 70.2% (test 2, post-teaching programme). The mean score in the control group was 50.3% (test 1) and 54.8% (test 2). Knowledge was retained up to seven months.CONCLUSIONSThe teaching programme was effective in improving knowledge of acid-base balance and cardiotocography and can be used by all staff whilst on duty on the labour ward.

Database: Medline

33. Education. Teacher versus the computer for instruction: a study.

Author(s): Wilson T; Mires G

Source: British Journal of Midwifery; Oct 1998; vol. 6 (no. 10); p. 655-658

Publication Date: Oct 1998

Publication Type(s): Academic Journal

Abstract: Computer assisted instruction (CAI) was tested for effectiveness within a small group of midwifery students. The topic covered was 'Interpretation of a cardiotocograph (CTG)' which is normally taught in a one hour tutorial session. Nine pre-registration students were chosen at random to be taught either by tutorial or a CAI package that had been written for medical students. A test of CTG interpretation was given to the whole group before instruction and the test was repeated, two weeks after instruction. The scores of the CAI group improved in the post-test compared to their pre-test scores, whereas the tutorial group showed no improvement. However, the pre-test revealed a higher level of prior knowledge in the group receiving the tutorial, compared to the group who were allocated to CAI. We conclude from the study that the CAI package was effective as the knowledge of the group given CAI improved and the improvement was maintained over a two week period. As the prior knowledge of the groups receiving CAI and tutorial instruction was different, we cannot compare the methods of instruction. The similarity of some of the pre-test results led us to believe that there may have been bias due to collaboration. Although only four students were in one group and five in the other, improvement was significant for the CAI group (Student's t-test P=0.04 for post-test compared to pre-test. This study has given us information with which to proceed to a study of larger numbers of students in which greater precautions will be taken to prevent collaboration motivated by inadequate knowledge in the pre-test.

Database: CINAHL

Strategy 773268

#	Database	Search term	Results
1	CINAHL	(Cardiotocography OR CTG).ti,ab	825
2	CINAHL	exp CARDIOTOCOGRAPHY/	598
3	CINAHL	(1 OR 2)	1182
4	CINAHL	exp "COMPETENCY ASSESSMENT"/	4798
5	CINAHL	(competenc* ADJ2 assess*).ti,ab	3361
6	CINAHL	(4 OR 5)	7512
7	CINAHL	(3 AND 6)	0
8	CINAHL	(competenc*).ti,ab	41490
9	CINAHL	(3 AND 8)	4
10	CINAHL	exp "STUDENTS, MIDWIFERY"/	1702
11	CINAHL	(3 AND 10)	1
13	CINAHL	exp "CLINICAL COMPETENCE"/ OR exp "EDUCATION, COMPETENCY-BASED"/	44064
14	CINAHL	(3 AND 13)	23
15	CINAHL	exp "TEACHING METHODS, CLINICAL"/	5466
16	CINAHL	(3 AND 15)	0
17	CINAHL	exp "LEARNING METHODS"/	19823
18	CINAHL	(3 AND 17)	1

19	CINAHL	exp TEACHING/	213155
20	CINAHL	(3 AND 19)	7
21	CINAHL	exp "COMPUTER ASSISTED INSTRUCTION"/	7456
22	CINAHL	(elearning OR "e learning").ti,ab	2151
23	CINAHL	(21 OR 22)	9114
24	CINAHL	(3 AND 23)	4
25	Medline	(Cardiotocography OR CTG).ti,ab	4705
26	Medline	exp CARDIOTOCOGRAPHY/	1987
27	Medline	(25 OR 26)	5873
28	Medline	exp "COMPETENCY-BASED EDUCATION"/	3809
29	Medline	exp "CLINICAL COMPETENCE"/	89949
30	Medline	(competenc* ADJ2 assess*).ti,ab	5867
31	Medline	exp "INSERVICE TRAINING"/	28500
32	Medline	(competenc*).ti,ab	79660
33	Medline	exp TEACHING/	83188
34	Medline	(elearning OR "e learning").ti,ab	2564
35	Medline	exp "SIMULATION TRAINING"/	8046
36	Medline	(simulation).ti,ab	179979
37	Medline	(28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 36)	417524
38	Medline	(27 AND 37)	74

40	Medline	exp "COMPUTER-ASSISTED INSTRUCTION"/	11613
41	Medline	(27 AND 40)	5
43	CINAHL	exp "COMPUTERIZED EDUCATIONAL TESTING"/ OR exp "PATIENT SIMULATION"/	4080
44	CINAHL	(3 AND 43)	0
45	CINAHL	(simulation).ti,ab	27494
46	CINAHL	(3 AND 45)	6
47	EMBASE	(Cardiotocography OR CTG).ti,ab	6755
48	EMBASE	exp CARDIOTOCOGRAPHY/	4571
49	EMBASE	(47 OR 48)	9438
50	EMBASE	exp "CLINICAL COMPETENCE"/	59204
51	EMBASE	(competenc* ADJ2 assess*).ti,ab	6026
52	EMBASE	exp "CLINICAL EDUCATION"/	14039
53	EMBASE	exp TEACHING/	88525
54	EMBASE	exp "MIDWIFERY EDUCATION"/ OR exp "MIDWIFERY STUDENT"/	608
55	EMBASE	(elearning OR "e learning").ti,ab	4235
56	EMBASE	exp LEARNING/	448220
57	EMBASE	(50 OR 51 OR 52 OR 53 OR 54 OR 55 OR 56)	579455
58	EMBASE	(49 AND 57)	96

59	EMBASE	(training).ti,ab	509981
60	EMBASE	exp "STAFF TRAINING"/	13100
61	EMBASE	(59 OR 60)	516883
62	EMBASE	(49 AND 61)	190
63	BNI	(Cardiotocography OR CTG).ti,ab	176
64	BNI	(competenc* ADJ2 assess*).ti,ab	1126
65	BNI	"COMPETENCY TESTS"/	92
66	BNI	(elearning OR "e learning").ti,ab	691
67	BNI	"ONLINE INSTRUCTION"/ OR TRAINING/	3941
68	BNI	"TEACHING METHODS"/ OR TEACHING/	11132
69	BNI	"MIDWIFERY EDUCATION"/	2367
70	BNI	(training).ti,ab	33241
71	BNI	(64 OR 65 OR 66 OR 67 OR 68 OR 69 OR 70)	47376
72	BNI	(63 AND 71)	10
73	BNI	(teaching).ti,ab	16845
74	BNI	(63 AND 73)	7
75	Medline	(training).ti,ab	379766
76	Medline	(27 AND 75)	109
77	CINAHL	exp "FETAL MONITORING, ELECTRONIC"/	1367
78	CINAHL	(6 AND 77)	4

79	CINAHL	(15 AND 77)	3
80	CINAHL	(13 AND 77)	50
81	CINAHL	(43 AND 77)	2
82	Medline	exp "FETAL MONITORING"/	8554
83	Medline	(37 AND 82)	144
84	Medline	(75 AND 82)	114
85	EMBASE	exp "FETUS MONITORING"/	14045
86	EMBASE	(57 AND 85)	166
87	EMBASE	(59 AND 85)	218
88	BNI	("electronic fetal monitoring" OR EFM OR "electronic foetal monitoring").ti,ab	213
89	BNI	(71 AND 88)	18
90	BNI	(73 AND 88)	6