HEALTH PROMOTION AND DISEASE PREVENTION **A Handbook for Teachers, Researchers, Health Professionals and Decision Makers**	
Title	**Perinatal Health Care Improvement in Macedonia Through Education: Case Study**
Module: 5.10	**ECTS: 0,5**
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Key words	Perinatal mortality, neonatal mortality, newborns, education, intensive care units, national health planning, health care, breastfeeding
Learning objectives	After completing this module-case study, students and public health professionals should: • Have a comprehensive understanding of the process of change management related to perinatal health care; • Be able to identify the common indicators of health and specific health indicators in the field of perinatal care; • Be induced to recognize the current policies and practices in mother and child care in their own countries; • Be able to identify the weaknesses of some practices; • Be able to recognize the need for change and to set the goals and objectives in perinatal health care improvement; • Understand the importance of intersectoral cooperation as an essential component within the implementation process; • Be able to assess the importance of the education and training in change management process; • Be able to recognize the most relevant learning strategies for each of the problems related to perinatal health care; • Be able to identify the most appropriate modes of assessment; • Recognize their own role and activities within the change management process and health promotion activities; • Recognize the importance of specific team-building actions.

Abstract	The Official Macedonian Reports on the situation in the field of perinatal health care showed for a longer period high rates in perinatal/ neonatal mortality which ranked the country in the bottom of the list of European countries. It required urgent Strategy for improvement the efficiency of perinatal care services in Macedonia in late 1990-ties. The main issues within the strategy were: prevention and health promotion, training and education, infrastructure, equipment supply, institutional and organizational change and policies and procedures. The example of Macedonia emphasized the role and the value of the education and training and health education in highly successful implementation of the National strategy for perinatal care improvement. The most appropriate learning startegies and methods of assessment were chosen in order to get the best scores in theoretical and practical sense. The greatest achievement was the overall decrease of 27% in the Perinatal Mortality Rate, compared 3 years before intervention with 2 years after starting intervention (27.4 to 21.5 per 1000 births) and decrease of 36% in early neonatal deaths in babies >1000g (12.0 to 7.7 per 1000 live births), reflecting the postnatal thrust of the program. The process of change management in perinatal health care was kept along implementing the standards, and the results were published as "successful story" in the final Report after the evaluation, prepared by the external consultant Prof Dr Heather Jeferry and submitted to the Ministry of Health of the Republic of Macedonia.
Teaching methods	After an introductory lecture students will work in small groups (group work) on recognizing strengths and weaknesses of the perinatal health care, process of change, interventions to be performed, assessing the methods of teaching and the role of education and training, which will be followed by group reports and interactive discussion. SWOT analysis will be performed for the perinatal health care in Macedonia. Discussion about the specific aspects of mother and child health care in their own countries, educational methods and proposals for changes will be encouraged. The students will be required to prepare individual presentation following seminar paper on proposal for change implementation related to some health problem in their own countries. Education and training should take great part of it.
Specific recommendations for teachers	The module might be organized within 0,5 ECTS out of which one third are lectures and group discussion supervised by the lecturer, second third will be used for literature searching (mainly Internet) and gathering material for their seminar paper, and the rest is for preparing individual seminar paper and presentation. Equipment: laptop, overhead projector, Internet access, flipcharts. Training materials: handouts, textbook, Target audience: students of Public Health studies, Obstetrics and/or Neonatology
Assessment of Students	The final mark should be derived from assessment of the theoretical knowledge (oral exam), contribution to the group work and quality of the Seminar paper on Change management proposal for improvement the efficiency of perinatal health care services.

PERINATAL HEALTH CARE IMPROVEMENT IN MACEDONIA THROUGH EDUCATION: CASE STUDY

Elizabeta Zisovska

Introduction

The Official Macedonian Reports on the situation in the field of perinatal health care demonstrated high rates in perinatal/neonatal mortality for a longer period, of final ranking Republic of Macedonia at the bottom of the list of European countries. This required urgent Strategy for improvement of the efficiency of perinatal health care services in Macedonia in late 1990-ties (1,2).

The primary idea for such strategy originated in 1998 when the doctors from three Departments (neonatology/intensive care units) within the Gynecology and Obstetric Clinic, the Pediatric Clinic and the Special Hospital for Gynecology and Obstetrics, all in Skopje, started complaining that the equipment was outdated, lacking or non-functional, there weren't standards for the appropriate levels of care regarding equipment, space and staff, accentuating that all these weaknesses are the main reasons for the high perinatal/neonatal mortality and morbidity rates. Thus, the need for an urgent change was apparent.

The initial requirement included the need for equipment and enlargement of intensive care beds (capacity). The objectives of the Ministry of Health (MOH) and the World Bank and the needs assessment clearly defined the urgent need for a larger initiative at national level.

The Report from the first meeting of the directors of these three hospitals, followed by a short overview on the perinatal/neonatal care services and data were submitted to the Ministry of Health, and accepted as a priority for the already secured Credit. The Government of the Republic of Macedonia secured a Credit (Cr.2889-MK) from the International Development Association (IDA) to help finance the development of the health sector, supported by the Health Sector Transition Project, including a component to strengthen the Basic Health Services. Part of this component related to the Perinatal Services Support Program. For the Republic of Macedonia this project was managed by the Macedonian Ministry of Health (MOH) through its International Project Unit (IPU), (3).

Objective of the Strategy

As defined by the MOH, the overall objective of the strategy was to focus on a neonatal intensive care network on a national level, with included tertiary and secondary care facilities together with supporting services and their efficient organization, but did not exclude relevant primary level health care services where appropriate (4,5,6).

Trying to follow the main rules of creating an appropriate strategy, all steps of managing changes were respected.

First of all, a Perinatal Management Committee was established, and its members were the most relevant policymakers together with the representatives from the three institutions providing perinatal health care in general, more specifically neonatal health care. An International Consultant working for the World Bank was engaged in the whole process of creating and implementation of the strategy (7,8,9).

Steps of the Strategy:

- Analysis
- Planning and programming
- Implementation
- Monitoring
- Evaluation

1. Analysis

In this phase, all relevant data were collected and a situation analysis completed. Mainly SWOT (Strenghts, weaknesses, opportunities and threats) analysis was performed for each of the services. The data were collected by visiting the health care facilities providing perinatal health care.

A report was prepared by the international consultant and the team leader, Professor Heather Jeffery from Sydney, Australia, supported by the MOH and the World Bank during the period from July to October 1999. The aim of the report was to recommend preparing a National Strategy for improving the perinatal/neonatal health care, to be used by the Macedonian MOH, health professionals and international agencies as a framework through which they would contribute to decreasing the perinatal mortality rate in the Republic of Macedonia.

What was concluded about the potentials of the overall health system:

- Within a relatively short time frame, namely three years, Macedonia had the capacity with a receptive, interested and energetic perinatal medical and nursing community, to reduce perinatal mortality and morbidity significantly;
- Since Republic of Macedonia became an independent country, a centralized health care system was developed under the new Constitution, drafted in 1991. The previous system included decentralization of health care, local financing by self managed communities of interest in health care, fragmentation and duplication of capacities, equipment and services and large numbers of health workers;
- Self-managed communities of interest in health care were abolished in 1991 and the Health Insurance Fund (HIF) was established within the framework of the Ministry of Health;
- Two advisory bodies were established: the Council for Health Care and the Council for Health Insurance with experts not pertaining to the Ministry of Health;
- Compulsory and additional forms of health insurance were introduced;
- Preventive health care related to protection from infectious diseases and environment protection was separated and covered by the central budget;
- Private health organizations were founded simultaneously beside the public ones.

There were limited information on the maintenance of breast feeding rates, although initiation of breast feeding was encouraged at all levels of care. However practices that interfered with breast feeding and the mother-infant relationship, such as routine 3-hourly feeding and lack of rooming-in, were almost universal in district and tertiary hospitals. The recent evidence certainly indicated that breastfeeding is an effecient form of immunization, with significantly reduced rates of respiratory and gastrointestinal infection in babies breast-fed during infancy.

UNICEF has implemented a widespread educational project to encourage supportive practices within these hospitals and established Baby Friendly Hospitals. In addition,

UNICEF intended to commence (September 1999) a cross sectional community study to examine practices and duration of breast feeding (10).

Main *strengths* of the perinatal health care services were considered:

- Commitment of the relevant structures (Ministry of Health, other key stakeholders);
- Regionalization of the health care (ensuring reasonable geographical coverage of the health care, sustainability of clinical skills, good usage of the capacities, reducing the costs);
- Sufficient human resources.

Weaknesses:

- High rates of perinatal and early neonatal mortality (11);
- Standards for appropriate level of care were not met;
- Outdated or lack of equipment;
- Inappropriate and insufficient distribution of the tertiary level beds;
- Non consistent curricula for the staff;
- Variable guidelines-protocols (evidence based medicine not implemented);
- Insufficient computer skills.

2. Planning and programming

Several phases based on their priority were planned, although some were supposed to go concurrently:

a) prevention and health promotion

- Use of evidence-based medicine to define the optimal number of ultrasounds in an uncomplicated pregnancy;
- Educational advice concerning periconceptional period;
- Implementation of the cost effectiveness of different screening methods;
- Since it has been proved and recognized the advantage of pain relief as well as psychological support, mothers were encouraged to choose support persons;
- The approach to breast feeding for all infants, and therefore, all medical and nursing staff caring for pregnant women and their newborns and infants, should be based on the evidence for the 10 steps to successful breast feeding (WHO recommendations). Rooming in should be instituted immediately throughout hospitals in Macedonia. For preterm neonates, early minimal enteric feeding of breast milk should be preferentially encouraged. Training of nurses specialized to support and facilitate lactation of mothers with term, preterm or sick neonates, suitable places to express milk and safe transport and storage of expressed breast milk should be implemented as soon as possible.

b) training and education

- Education of specific medical and nursing staff in up-to-date management of Neonatal Intensive Care Unit (NICU) care in overseas units was found to be necessary as a high priority. The overseas units had to agree to provide opportunities for Macedonian doctors and nurses to gain expert and current knowledge and skills, based on practical clinical experience. Exposure to teaching, research, critical appraisal and perinatal data collections and analysis were also desirable;
- Health education in secondary care obstetric and neonatal departments included continuing medical education (CME) program for all doctors and nurses who take of neonates.

CME started one week after the departure of trainees from Sydney in June 2000, when the first team of two nurses and three doctors left the Royal Prince Alfred Hospital for Skopje,

the capital of Macedonia, to commence the local training in a purpose to built Continuing Medical Education (CME) Centre in Skopje. These modules of training differed from the Sydney program, since the teaching had no clinical component and was entirely composed of structured teaching sessions. These used a variety of modern educational methods shown to be of benefit in the teaching and learning of practical skills.

This programme was to target nursing and medical clinicians from district (Level 2) hospitals in Macedonia. The brief included further consolidation of the educational skills of clinicians who had recently been educated in Sydney. This was achieved by having a team of local and Australian educators working together allowing supervised teaching practice.

- Continuing medical education program that included appropriate and safe use of equipment for neonatal problems and for stabilization prior to neonatal intensive care transport to a Level III unit, management of common neonatal conditions;
- Early referral of high risk mothers to achieve transfer in utero rather than neonatal transfer by a retrieval team;
- Use of evidence-based protocols, generated in conjunction with the tertiary obstetric and neonatal units in Skopje and updated regularly;
- Educational reform in nursing considered as a pressing need;
- Undergraduate medical education including basic knowledge, skills and attitudes relevant to the healthy neonate and to the common conditions in the sick neonate;
- Postgraduate neonatal training (general pediatric registrar training to include rotations in neonatal care, both level II and III, at the three major hospitals in Skopje and defining and implementing subspecialty training in neonatology are urgent needs).

c) infrastructure

- Reorganization and reallocation of two neonatal intensive care units (NICU) had to be implemented (Clinic for Gynecology and Obstetrics and Pediatric Clinic);
- Refurbishing of level II or III units, labor wards, rooming in facilities should facilitate easy access for staff to hand washing;
- A Perinatal Committee had to be formed and led by obstetric and neonatal medical staff, with representatives from the Clinic for Gynecology and Obstetrics and other institutions.

d) equipment supply

Introduction of equipment to level II and III units, staged according to operating bed numbers and completed education, commencing with level II concurrent with education, proceeding to level III after overseas educational experience.

e) institutional and organizational change

Further development of the Clinic for Gynecology and Obstetrics as the high-risk maternity hospital required commissioning and expansion a NICU containing ventilating beds. This was an urgent and high priority need.

f) policies and procedures

- *A* perinatal death classification that specifies various antecedent maternal conditions, pregnancy complications and fetal abnormalities, had to be used to identify causes of perinatal death amenable to preventative strategies;
- UNICEF was approached to provide additional useful information on infant care practices in their breast feeding survey, especially on the usual position of the infant sleeping during the first six months after birth;
- Evidence-based protocols for perinatal care were urgently needed and included beneficial interventions that will reduce mortality and morbidity.

3. Implementation

Stage 1 (completed into 6-12 months)

- required attributes of doctors and nurses, the objectives and the potential destinations for overseas training in level III and II units, were defined, such as
  a) attributes of doctors and nurses;
  b) the objectives for level III doctors and nurses training overseas were set;
  c**)** destinations for level III / II training identified, and ensured the unit accepting responsibility for training, was able to demonstrate that the trainee will receive exposure and practice in the listed skills, use epidemiological principles to guide practice including ability to teach critical appraisal, use of the Cochrane database, collection and use of perinatal data, engaging in peer review and quality assurance programs.
- doctors and nurses from tertiary and district hospitals were selected;
- CME for level II training of doctors and nurses was organized;
- equipment in level II-a was installed;
- Structural changes concurrent with educational implementation were introduced.

The main goal was achieved during this stage: trained 25 doctors and nurses, and among them the teachers for the Level II CME in Macedonia were selected. Each participant who obtained the required standard of performance received a certificate from the University of Sydney.

The three main components of the training were: learning objectives, teaching methods and assessment. These components of the teaching sequence were interrelated and integrated to optimize the learning process.

1. Learning Objectives were clear statements of what trainees should be able to do as a result of the training. The content and the teaching methods introduced were designed to implement and evaluate the effectiveness of the educational program in Newborn Care, using the best evidence teaching methods and content. Pre intervention, an audit of newborn care practices and documentation was performed using a structured checklist. This intervention consisted of different teaching sessions each involving short lectures, interactive skills stations and practical training "hands on". Post intervention, participant satisfaction, knowledge, competence and performance were evaluated. Matched pair pre and post education Multiple Choice Questionnaires (MCQ) scores compared knowledge, with significant improvement in both groups (nurses and doctors).

2. The teaching methods (strategies of teaching) in Sydney were different, all of them confirmed and accepted as evidence based education in adult learning. The learning was enhanced by allocating more time to small group problem-based learning activities.

What were the methods?

- plenary lectures
- SCORPIO teaching
- small group learning
- problem based learning
- hands-on training (practical teaching)
- self-directed learning

Plenary lectures: the Lecture as a transmittal technique was the most commonly used instructional strategy for working with groups of adult learners. Lectures were taught in 15-

to 20-minute sections spaced with active learning activities to reenergize the participants for the next wave of information. The lectures were useful for presenting up-to-date information; summarizing material from various sources; adapting material to the background and interests of a group at a particular time and place; helping learners read more effectively by providing orientation and conceptual framework; and focusing on key concepts or ideas. The lectures created interest in new topics, motivated doctors/nurses to research further, or challenged ideas from their previous experience;

SCORPIO teaching (Structured, Clinical, Objective, Referenced, Problem orientated, Integrated & Organized) sessions were used as a way to maximize in-depth learning. The SCORPIO method was well tested as effective method of practical, skill-based, small-group teaching. SCORPIO involved delivering a syllabus through a series of lecture-demonstrations during which students, teachers and patients gathered at a designated area. Following a short introductory lecture, participants rotated in small groups, through a series of teaching stations. These stations were structured to provide participants with a problem-based, integrated learning experience. Each SCORPIO lasted for 3 hours. Small groups of up to six trainees usually rotated around five teaching stations spending 25 minutes at each. A tutor at each station conducted the teaching sequence which addressed a pre-determined learning objective written up in the study guide. The objectives varied from a problem solving activity at one station to communication skills training at the next to physical examination to learning a procedure and so forth. At some time after the teaching rotations a performance-based formative assessment feedback on their performance was held to ensure that the trainees had mastered the learning objectives. A structured approach to skills training; „tell, show, do, feed-back" was introduced. Participants were also asked to evaluate the teaching sessions (13);

Small group learning: The curriculum delivery system at the University of Sydney Medical Program has been designed specifically to promote students' commitment to deep learning. Measurements such as learning preferences and personality types helped to determine the relationship between such student attributes and other variables such as anxiety levels;

A Problem-based learning (PBL) was used introduced as well. Progressive development of the delivery of PBL has been undertaken in order to promote the maturation of clinical reasoning skills. One of the major research interests of the Discipline was the research into theoretical underpinnings and implementation of PBL including the use of IT for distributed learning. When provided with a clinical scenario, the current problem was presented, discussion provoked and clinical pathway related to the problem was identified;

Practical teaching (hands-on training) was performed every day, involving the trainees in the daily work of the Unit. They were also included in the roster duties during the night;

Self-directed learning helped the trainees to search for the literature and practices used worldwide, and to prepare their individual papers and presentations.

3. Assessment is the third component of the learning sequence and like the teaching was multi-dimensional given that different methods were necessary to assess objectives in the different learning domains. Generally, assessment methods fall into four classes; pen and paper tests, performance-based tests, individual presentations and personal learning portfolios. Multiple Choice Questionnaires (MCQ) and Short Answer Questions were two commonly used pen and paper tests. They were reliable methods to assess a knowledge base and were the principal modalities used in the program. The Objective Structured Clinical Examination (OSCE) was widely used performance-based test. It was a valid and reliable

way to assess competence in the skills domain. The OSCE was a two-hour examination during which students moved through several stations (10 minutes per station x 10 stations) where they were examined on different aspects of the station's subject or clinical materials provided at the station. The trainees were also invited to prepare individual presentations on different topics by their choice on one change they would like to institute on their return to Macedonia. This assessment was intended to be useful to the candidates in that they would be able to use the presentation they produced in their own country. They were assessed not only on factual content but also on presentation skills. The Personal Learning Portfolio was a self managed assessment tool, recommended for trainees to reflect on actual learning and enhance their competence in addition to the participation in the training program. Participants were introduced to the concept of the Learning Portfolio during the introductory program. They each kept a portfolio in which they noted their reflections on the work of each day. The participants were interviewed on the content and the process of keeping their Learning Portfolio. The interviews were structured with six key questions and were conducted by two examiners. The educational value of the formative assessment was highlighted in the program with formal pre and post testing of trainees.

Stage 2 (completed after education and structural changes, ideally within 12 months, although full NICU functioning bed capacity was intended to take up to 3 years)

Installing the equipment in level III units was planned as soon as their reorganization and reallocation were finished.

4. Monitoring

Data for monitoring and evaluation from the statistical reporting of perinatal outcomes were based upon:

- a minimum dataset of outcome variables;
- clearly defined definitions of each variable;
- ongoing education at each hospital, especially for the audit nurse and all perinatal medical and nursing staff, in order to develop a more critical, analytical view of their own hospital's important and relevant statistics. This should form the basis of regular audit and review;
- quality checks on data.

5. Evaluation

Three years later all relevant indicators (reported in the situation analysis in 1999) were reevaluated and a Report was published (13).

The Evaluation of the National Perinatal Program occurred during 3 weeks in January 2002, exactly 2 years after the commencement of the implementation when education of trainees started in Sydney, early February 2000. The team of evaluators included the following members:

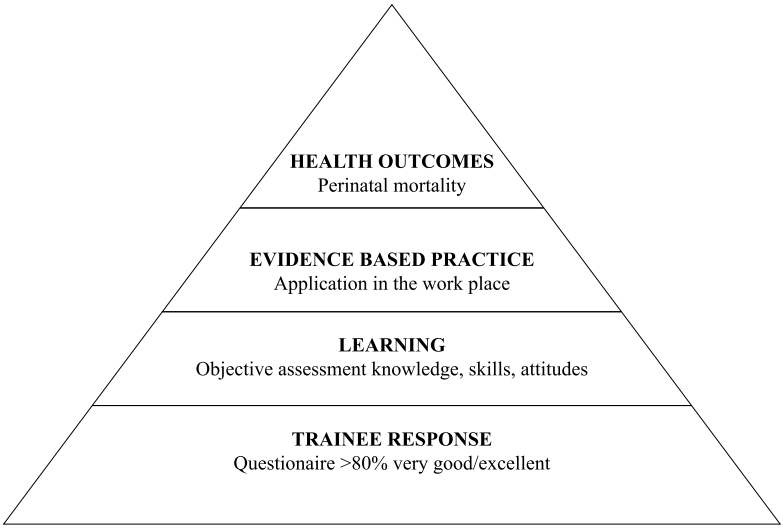
- *2 overseas consultants***,** both of whom were thoroughly involved with implementing the program from its inception. These assessors were able to use the evaluation as a learning experience by providing direct feedback on perinatal mortality for the specific hospital in the context of National Perinatal mortality rate and on many practice issues;
- *2 members of the International Project Unit (IPU) of the MOH*. Both were very familiar with the project from its inception. One of them has visited the same hospitals during

the situational analysis in July 1999 together with the Chief International Consultant;
- *2 observers from the Paediatric Clinic* who were not directly involved with the implementation;
- *1 neonatologist* who was also the coordinator of the CME centre, responsible for continuing the educational program with her teachers, all trainees from Sydney (present at the four largest hospitals).

Methods of evaluation:

In planning this program, outcomes to be assessed were those suggested, illustrated and prioritized as follows (14):

Graph 1: Priorities for the evaluation process of the project



Five outcomes were thus assessed (Graph 1):
- The Perinatal mortality rate in Macedonia during 3 years before intervention (1997-1999) compared with the rate during 2 years after the intervention (2000-2001) in 16 hospitals with >93% births represented (table 1);
- Evaluation of implementation of evidence based practice in these 16 hospitals;
- Assessment of teachers at CME Center and assessment of trainees in Sydney and in Skopje;

The assessment of the trainees was performed by several proved methods:
- Learning portfolio interview;
- Individual presentations;
- Multiple choice question paper (MCQ test);
- Short answer paper;
- Objective structured clinical examination OSCEE (for assessing skill acquisition).
- Response of trainees to the educational program in Sydney and in Skopje;

The overall assessment of the teaching in general was carried out by the trainees in both Sydney and Skopje, at the end of the each session, and at the end of the course. Participants

were asked to rate five aspects of the training program on a five-point, Likert scale.

- Achievements and failures compared with the original recommendations of the report dated September 1999.

Table 1. Perinatal mortality rates, pre- and post-intervention in Macedonia

	Pre-intervention 1997-1999 (3 years)	***Post-intervention 2000-2001 (2 years)***	***% of decrease***
Perinatal Mortality rate* (per 1000)			
All	27,4	21,5	27,4
>1000 gms	23,6	16,9	28,0
Fetal Mortality Rate* (per 1000)			
All	14,1	11,6	17,7
>1000 gms	11,8	9,3	21,0
Early Neonatal Mortality Rate (per 1000)			
All	13,5	10,0	26,0
>1000 gms	12,0	7,7	36,0

Source: Evaluation of the National Perinatal Program in Macedonia. Health Sector Transition Project 2002.

* Denominator=all births

** Denominator=livebirths

As a comparison, in Table 2 the same mortality rates in the same period, as well as in the period from 2002-2005, are presented, exploring another source of data.

Table 2. Perinatal mortality rates in Macedonia in the period from 1997-2005

	Period I preintervention 1997-1999 (3 years)	***Period II postintervention 2000-2001 (2 years)***	***% of decrease periods I/ II***	***Period III postintervention 2002-2005 (4 years)***	***% of decrease periods II/III***
Perinatal Mortality rate* (per 1000)					
All	20,6	18,3	12,6	18,1	1,1
***Fetal Mortality Rate**(*per 1000)					
All	11,2	10,7	4,7	10,6	0,9
Early Neonatal Mortality Rate (per 1000)					
All	9,4	7,6	23,7	7,5	1,4

Data source: Eurostat

* Denominator=all births

** Denominator=livebirths

As it is obvious, there are some differences in the perinatal data between the two sources. It is due to the different methodology in collection. It was also a reason plus to think about improvement of data collection system.

What else should we find within the Table 2?

The improvement didn't follow the same line in the years after, what suggested that the sustainability of the Project was not ensured and that remained as an objective for the further activities and plans.

External considerations that affected the project

It is noteworthy that all results of this project were achieved despite the obstacles that were endangering the continuous activities such as:

- Frequent change of the directors of the major three institutions. More than 8 changes of these people took place during the project. Although most of them were supportive of the project, each new director needed time to understand the changes connected with the project. This slowed down some of the activities;
- Frequent change of the Ministers of Health;
- Change of local directors in University clinics and Medical centers;
- The conflict in Macedonia in 2001 compromised some of the major activities in the western parts of the country and postponed visits of the International Consultant. Modules for education in this regions were also procrastinated;
- Primary failure to include obstetricians in the process of changing the approach towards perinatology/ perinatal care;
- Primary opposition of neonatologists who did not participate and felt endangered by the new trainees in Australia.

Finally, the executive summary of the Report "Evaluation of the national perinatal program in Macedonia (2002) showed (14):

The evaluation of the National Perinatal Strategy for Macedonia was undertaken in January 2002, two years after trainees first arrived for educational training at Royal Prince Alfred Hospital in Sydney. The major component of the strategy was given to the educational intervention alone with training-the-trainers approach (15). Equipment was only commissioned in January 2002. Thus, the impressive reduction in Perinatal Mortality Rate could largely be attributed to education.

Achievements:

- An overall decrease of 27% in the PMR, when careful data collected from 16 hospitals (>93% births) were compared 3 years before intervention 1997-99 with 2 years after starting intervention 2000-01 (27.4 to 21.5 per 1000 births) and
- Decrease of 36% in early neonatal deaths in babies >1000g (12.0 to 7.7 per 1000 live births), reflecting the postnatal thrust of the program**.**

The educational methods used have been based on evidence of effectiveness and the content emphasized four themes, namely perinatal skills, educational theory, change management and basic epidemiology with an evidence-based approach to practice. The intervention has increased the capacity of Macedonian doctors to practice the best-evidence perinatal medicine and improve the outcomes. Sustainability is predicted by the “train the teachers” approach, with concurrent strengthening of the infrastructure and organizational framework.

Training of carefully selected doctors and nurses in modern neonatal care in a foreign country (Australia) was very important, in order to recognize the great differences in current approach. This was not envisaged as possible by delivering a program entirely within Macedonia and is attribute to the young Macedonian trainees that they could accept and then implement such vast changes in practice in the face of considerable opposition initially.

Continuous and supportive involvement of the Australian teachers, both doctors and nurses, with the Macedonian teachers during the handover to a sustainable, self directed

program was of invaluable importance. This was achieved by the 4 modules delivered in Macedonia during the second half of 2000. The ability to provide a dynamic educational program, readily modified by the perceived needs of Australian and Macedonian teachers as they each became more familiar with the needs in Macedonia.

The readiness of the World Bank and IPU to provide additional support for further intensive training in Sydney, ensuring a sufficient number of trained doctors and nurses in the tertiary institutions (9/14 doctors and 5/20 nurses-midwives in Sydney, and 5/14 doctors and 11/20 nurses-midwives through CME in Skopje) where there was the ability to influence tertiary and district hospital management, according to up to date evidence based protocols in perinatal care in the future.

The results were compared in two periods, before the Implementation (1997-1999) and after it (2000-2001). The same methods were used.

The survey for the minimal data set was performed in 1999 for the purpose of creating the strategy, it's implementation and evaluation. The same indicators and data were collected during the second period by the participants of the Cohort 1 at the CME center in 2000 and 2001. The trainees including doctors and nurses from 16 hospitals undertook an exercise in data collection. They examined the original data from the labor ward books and the special care nursery admission books (well kept and reliable sources of births and deaths) and extracted weight, gestation, gender, living or dead, cause of death , onto simple data sheets for each death, countered all births by weight categories in 500 gm increments for each year starting from 1997-2001. The database enabled calculation of baseline statistics prior to intervention for the 16 hospitals where 93% of births occurred in Macedonia.

Conclusions and recommendations

These striking results are consistent with the high penetration of implementation of evidence into practice that was observed at the 12 maternity units and 2 pediatric units that were assessed. They were consistent with the rigor of the assessment techniques required for certification of the 115 successful trainee doctors and nurses and anonymous questionnaires and evaluations from the trainees which indicated a high level of acceptance of the educational curriculum, teaching and assessment methods. At the end, over 50% (43/82) of doctors and about 30% (72/243) of nurses/midwives who cared for neonates and infants in Macedonia have been certified. This was the first time that teams doctors/nurses were educated together, with the same methods and in the same time for the same purpose. Meanwhile, after the equipment distribution, three more cohorts were trained and participants certified.

The practices which were improved only following the education were connected with: thermoregulation, breast feeding, safe sleeping, feeding, treating jaundice, infection control, resuscitation, hypoglycemia, respiratory distress, apnea, stabilization for transfer, rights of the child, etc.

The involvement in this training program was a life-enriching experience to both trainees and educators. Over eight months doctors and nurses from very different backgrounds, dealing with different challenges in their day-to-day life have learned from each other, supported each other and solved the problems together. Contact is maintained by e-mail ensuring ongoing support of the program and informal news of how changes are being implemented.

The evaluation of the ten teachers, who were trained in Sydney with a train-the-trainer approach, indicated a skilled team of doctors and nurses, competent in delivering a curriculum using modern, innovative teaching methods and multi-faceted assessment techniques. The educational program was sustainable providing the goals set before the program.

The future goal is to decrease PMR to <10 per 1000. This requires attention to the obstetric/midwifery component of perinatal health. The environment for change is ripe to rapidly gain improved health outcomes for mothers and babies from further investment. This is a National imperative and should be part of the National Health Strategy.

The success of this Perinatal Program is due to many and represents a truly excellent example of teamwork and of collaboration among the Ministry of Health of Macedonia, in particular the International Project Unit, and the World Bank, UNICEF and the Royal Prince Alfred Hospital in Sydney. It remains a special attribute to the key administrators and advisors in the IPU, the teachers and the trainees.

The principles and the ingredients to a long term Perinatal Strategy have been suggested within the report. The blueprint stands as an example for reform in other acute care systems. This is the most obvious example how the training process can make difference in the health care system at all.

Exercise

Task 1:

Working under a supervision of the lecturer, the students should be mainly focused on two fields:

- Interactive discussion on the steps of the process of implementation of the strategy, after the group working on the presented case-study for improving the Perinatal Health care in Macedonia through education
- Group work on different educational methods of adult learning and their advantages/ disadvantages. Specifically should be discussed the educational methods and their impact on the overall improvement of the mortality rates in Macedonia.

Task 2:

Students should use additional recommended readings in order to increase their knowledge and understanding of the process of change management. As output, students should write a seminar paper on change proposal, related to some health problem in their own countries. In addition, student should be encouraged to make an investigation regarding some evidence-based practice that is not implemented yet in the hospitals in their countries. They should be asked to search the literature (Internet) about the guidelines and evidence-based medicine papers regarding some specific topics and their implementation in the clinical practice. The main issue of their strategy should be a plan of education for implementation of change. Focus should be put on the learning objectives, learning strategies and assessment.

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