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From the editor



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A paper from the UAE tries to examine the nursing shortage by identifying the factors that lead to it. The author stressed that highlighting the causes that escalate the international problem of nursing shortage will not solve it, but indeed it might drive concerned people to adopt certain strategies that will contribute in effectively solving it. The author suggests a collaborative approach by all stakeholders, and communities and nurses themselves who should be the best advocate for their profession. All of these efforts are pointed out by many authors to minimize the magnitude of this vital problem.

A paper from Iraq presented evidence based guidelines on prevention and treatment of iron deficiency anaemia in Iraqi pregnant women.

The authors stressed that anaemia is the commonest medical disorder in pregnancy and has a varied prevalence, aetiology and degree of severity in different populations, being more common in developing countries. The authors pointed that the aim of this

guideline is to assess the evidence regarding the prevention and management of anaemia in pregnancy, particularly iron deficiency anaemia.

A paper from Iran discussed the current status of Nursing. The authors

studied a sample of 166 nurses with 2-6 month's experience of work .

A total of 161 nurses reported a positive experience in interacting with physicians and other nurses. The authors recommended complete orientation time and provision of a support system.

Dr Kaldi AR through quantitative and qualitative research collected data using 50 prisoners looking at factors leading to family violence and spousal murder. The authors concluded that the crucial factors in committing this crime are economical problems, lack of information as to legal affairs, lack of information as to protective centres, legal cost, imposed and early marriage, age difference and existing problems of divorce.

TITLE: NURSING SHORTAGE, CAUSES AND POSSIBLE SOLUTIONS

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ABSTRACT

In this paper the writer tries to examine the nursing shortage by identifying the factors that lead to it. Nevertheless, highlighting the causes that escalate the international problem of nursing shortage will not solve it, but indeed it might drive concerned people to adopt certain strategies that will contribute in effectively solving it.

However, a collaborative approach by all stakeholders, communities and nurses themselves who should be the best advocate for their profession, all of these efforts are pointed out by many authors to minimize the magnitude of this vital problem.

The mass media has a very important role in public awareness and change of its perception of the nursing profession which might reflect positively in improving its image.

The paper will recommend some solutions and actions that should be taken seriously and adopted by decision makers to overcome this problem.

Hopefully in the near future the profession will attract many young females as well as males to join it. Furthermore the existing nurses will be motivated and less likely to leave the profession.

Introduction:

Mass literature addresses the problem of nursing shortage and its adverse effects on the health care systems and their outcome. Nursing shortage is a serious problem that needs urgent solutions. Some honorable nursing societies like, the Honor Society of Nursing, Sigma Theta Tau International recognizes the nursing shortage as a major threat to the future of the world's health care system.

In this paper I intend to participate in highlighting this international problem and trying to identify some of its causes as well as recommending some possible workable solutions which might contribute in minimising it.

Nurses Shortage - Is it real?

Yes, is the answer of the above question, as it is a consensus in the literature dealt with the topic regarding nursing shortage. Today's nursing shortage is very real and is a common problem worldwide, which is being discussed in the literature. Currently nursing shortage is evidenced by fewer nurses entering the profession, and by the increasing demand for nurses. There is a noticeable shortage of nurses who are appropriately prepared and qualified to meet patients'/clients' needs and provide safe nursing care in a changing health care environment. Lassey et al (1997) stated that in the USA the increased cost of well-trained nurses led the hospitals to employ less trained nurses or even nurse aids to lower the cost.[6]

On the other hand, there are many nurses who leave nursing and take another profession. This shortfall will grow more serious over the next 20 years and it is expected to become a serious problem. This prediction is also supported by a report from California Health Care Foundation which states that "everyone agrees that the problem of shortage in nursing is going to get worse by 2020."² Therefore, by 2020 the number of nurses will fall nearly 20% below requirement. [1]

It is quite essential to identify the causes that impacted the enrollment of students in nursing programs as well as the increasing number of nurses who leave the profession. Remedial actions are acutely needed to solve this critical problem.

What are the causes and possible solutions?

Nursing shortage as a worldwide common problem is being dealt with by the media in many countries with emphasis on its causes, but unfortunately

the efforts to tackle the identified causes and prevent the occurrence of future ones is quite unnoticeable. This notion is also indicated by some authors in the literature as well as the media, for instance it is stated that, currently causes of nursing shortage and its magnitude are being discussed widely in the press. However, solutions for this problem have been quite few.[10]

A list of the causes of less students joining nursing schools are identified in the ACCESS NURSES Website as "professional alternatives" which means many young women tend to choose other careers rather than nursing which is considered by many nurses as a highly demanding and stressful profession.

Another cause indicated in the above article is the declining enrollment of student nurses and nurse educators, as recently new admissions into nursing schools have dropped dramatically and consistently.[1]

In 1977 China put more emphasis on nursing education, but still sufficient training programs are not available to meet the national requirements.[6]

This decline in student nurses' numbers might also be due to the above stated causes. Another market that needs to be pursued is males. Increasing the number of male nurses in the profession will backup the shortfall.

Furthermore the nurses' role is not limited to providing direct patient care but is continuously extended to include other non-nursing activities. This might be due to lack of other support staff e.g. unit clerks, porters. The expanding nurses' role and its resulting constraints on hospital resources have made nursing profession an increasingly over demanding, and stressful occupation and even less desirable. [1]

The American Nurses Association (ANA) believes that a major contributing factor to the current and emerging nursing shortage is dissatisfaction with the work environment.[9] Dissatisfaction and occupational stress can lead to burnout which might lead to nurse turnover.

There are various factors that can

cause nurses' negative reaction which might lead to burnout. Tappen (2001), listed factors she considered as contributing to such negative reaction in healthcare professionals including nurses, such as low pay; long hours; too much paperwork; client losses; lack of appreciation and understanding; Lack of support; Unresponsiveness to client needs by the healthcare system which conflicts with the professional ideals; powerlessness; discrimination; inadequate advancement opportunities.[11]

Thus, different strategies and approaches are needed to address varying needs among nurses, which in turn will contribute to the resolution of the problem.

Recently it is found that nurses need recognition for a job well done. It is a right of the nurse to be appreciated and recognized for being competent and doing a good job, which is not the case most of the time, although nurses provide most of the care needed by their patients/clients as they spend more time with them, as indicated by Kathy Quan who mentions that nurses are shifting into an ever expanding role of health educators, as well as providing more direct care to the patients.[5] However, the nurse is the least who gets credits and recognition in case of positive patients'/clients' outcomes. Hence, respect, recognition and acknowledgment of nurses' contribution to patient care is a strong factor that might participate in retaining them.

On the other hand, the area that needs to be addressed most critically is nurses' work environments.4 Nurses work in distressing environments. Therefore, the difficult working conditions push many female nurses to leave the profession, and some of them migrate to other countries especially USA looking for higher payment and better working settings.

Nursing shortage is highly reported in Sweden because, trained nurses leave the profession to join more satisfying occupations.

Moreover, nurses' salaries should be proportionate to their skills, education, and experience. Many nurses are paid less than what they should be especially in the developing countries, despite the fact that their profession

is over demanding and distressing as well as less rewarding. In Japan nursing shortage is mainly due to low status and pay of nurses compared to physicians.[6]

Lack of equity and respect can be very distressing and de-motivating for nurses. Nurses need to be treated fairly and respectfully by their managers, \ their senior colleagues and senior-level leaders.

Nurses' schedules have to be flexible as nurses have to do shifts which might disrupt the nurse's family and social life, as nurses might work for long hours as well as evenings and nights especially in hospitals.6 That's why many nurses don't recommend their children to enter the profession. A result of a survey conducted by the American Nurses Association (The ANA Staffing Survey), shows that over 54 percent of nurse respondents would not recommend their profession to their children or their friends.[8]

Nursing shortage is not only addressed by the Western countries (e.g. USA, Germany), but also places like East Europe (e.g. Czechoslovakia, Hungary), the Middle East, Africa, and even in the Gulf Region have started to highlight the problem of shortage of nurses in the health care settings especially the local nurses. There are various studies done to find ways or strategies to overcome this problem by trying to make nursing profession an attractive one For instance there are two studies conducted in the United Arab Emirates by Emirati nurses as part of the requirement of Leadership For Change (LFC) Program. The first study was conducted in 2005 by Salma Al Nuaimi and colleagues. The main question asked by the study is "Why Emirati Students are Not Entering Nursing Profession". The target group was the public secondary school female students. It is important to mention some of the study suggestions and recommendations which are, to change nurses' uniform "as the nurses uniform is not accepted culturally"; more lectures to be conducted to encourage students/parents; this recommendation is essentially needed to increase their awareness of nursing; use of the media to orient the community on a positive nursing image, and highlighting the importance and value of nursing. Another recommendation is to increase

the nurses' salaries.[13]

The second study was conducted by Almustafa et al 2006 (unpublished), it is about how to increase the number of Emirati Women Enrolled in Nursing Programs. The study was designed to answer a question: "Why Do Emirati Women Not Join The Nursing Profession?" They studied a group of 56 grade 12 students from the government schools. They used a quantitative and qualitative questionnaire. A pre and post questionnaire was distributed to participants. The pre questionnaire identified the barriers for students not to be nurses, which is mainly related to the image of nursing as not culturally valued and shift work. The pre-questionnaire analysis shows that 89% of participants have limited understanding of nursing as a profession. The results also identified that the barriers for students to become nurses are quite similar to the previously mentioned study, for instance, the community view of nursing "low image"; limited understanding of the nursing profession; nursing is a tiring job; and low salary. The researchers suggested a future plan as to: increase the level of perception of the students, community i.e. increase awareness; and to transfer the ownership of the recommendations to higher authorities.[14]

The image of nursing is one of the major causes that influence negatively the enrollment of students who join nursing especially in the Gulf region due to cultural regards. Low image of nursing is a common phenomenon, which faces nurses even in the so-called developed countries. It is mentioned in the literature that in Russia hospital nursing does not have much prestige.[6]

Nursing image has to be changed. This can be started through reaching school children at an early age. It is recommended by educators that students often have their minds made up by fifth grade, of their desirable and undesirable careers, thus an early positive image of nursing should be emphasized. 1 Megan Malugani who is one of a Monster Contributing Writer, in her article "A New Image for Nursing" reported that "with a major nursing shortage on the horizon, healthcare and nursing organizations are giving the profession a dramatic makeover in hopes of attracting a new, diverse

generation of RNs to the workforce".[3]

Furthermore, "A Call to the Nursing Profession" - was sponsored by the American Nurses Association and the Nursing Organization Liaison Forum.[4]

Creating Cultures of Retention, as identified in the literature [1] is another strategy to be adopted to overcome nursing shortage. To retain nurses is not that easy, it needs a collaborative effort from nursing leaders, practitioners, health care executives, government, and the media. [10]

Moreover, effective administrative structure; quality patient care; and investment in professional development of nurses could reflect positively in nurses' retention. Nonetheless, nursing staff must be involved in defining and developing the practice of care in the organization since they are the closest to the patient. This includes participation in the financial management of their units.[10] All of above mentioned are important factors that might help in nurses retention, and boost their morale.

Nevertheless, Strengthening the Infrastructure is an initiative in the USA that aimed to promote people to enter and remain in nursing careers, which will eventually reduce the continuous shortage. The Nursing Reinvestment Act was signed by President Bush in 2002 to address the problem of USA nursing shortage. That initiative establishes scholarships, loan repayments, public service announcements, retention grants, career ladders, and grants for nursing faculty.[1] If the US initiative is adopted by countries in which nursing shortage is a major problem might be of great help in overcoming the problem.

Retaining nurses and encouraging students to join nursing might also be accomplished if nurses are encouraged and supported to develop their knowledge and skills, also it is high time that nursing as many other professions has to encourage nurses to be specialized, as most of the nurses are generalists. This in turn will weaken the profession. Currently, there are critical needs for experienced nurses in areas such as the operating rooms, critical care, and neonatal care arenas. Therefore, hospitals should reintroduce intensive training programs for nurses in these specialties, which

in turn will help to retain nurses who are looking for a transfer opportunity as well as to recruit new staff. It also builds a career development path for staff, which is not the current case as careers in nursing have been constrained by limited opportunities for advancement as discussed by Lassey and his colleagues.[6] Unless nurses are provided with chances to develop their subsidiary status, they will never be able to change and grow.

It is worth mentioning that the government of Japan in 1993 attempted vigorously to increase student nurse enrollment in nursing school by providing services such as providing loans to students, subsidizing private nursing schools, and providing supportive services e.g. day care in hospitals.[6]

Internship programs are another area that has to be considered, as it is very important for newly graduated nurses to bridge the theory practice gap which might lead to reality shock as identified by Kramer since 1974. Reality shock might have a negative effect on novice nurses which might cause some of them to leave the profession early and be a negative influence on student nurses as well as other potential students.

Conclusions:

Nursing shortage as a major universal problem cannot be solved easily by writing papers. Joint efforts and genuine intentions of decision makers as well as nurses themselves can be a magical tool to solve the problem. Various studies analyzed the problem and identified many causes and reasons that create and escalate it.

Realizing the seriousness of the problem and recognizing its causes, might be an effective tool that can be used in adopting specific strategies to keep nurses in the profession and attract both genders to enter it, particularly: improved work conditions with less stressors, recognition, appropriate rewards and better payment, can be motivating and will enhance nurses' job satisfaction. All of these factors and others will of course share in solving the nursing shortage problem.

Nurses have a major role to play. They must become more of a voice in the press[11]. This phrase should provoke nurses to make their voices

heard. They should be advocates for their profession and try to smarten it, and draw public attention to its advantages as well as emphasizing the fact that:

"As a career, nursing offers a unique combination of job security and adrenaline-pumping excitement. There are also plenty of opportunities for career advancement, from high-paying nurse executive and nurse practitioner positions to prestigious research positions as nurse scientists."[7]

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ABSTRACT

Considering that nursing graduates are included in the human force project in our country, this has been a necessary investigation. The results of this study will help nursing teachers prepare students for entrance into the clinical field and the real work situation and assists nursing managers in creating an appropriate and favorable environment for them.

Objective: Assessment of the Man Power Design Program and the work nurses; and of the Program in tasks such as duties, and interactions with the Physicians and coworkers.

Design: This was a descriptive study in which self report questionnaires were used as a data gathering tool.

Sample: 166 nurses with 2-6 month's work-related experience contributed to this study.

Results: Many of the nurses (n=161) reported a positive experience in interacting with physicians and other nurses, while some (n=147) said that they had negative feedback. According to their experiences in a real work situation 45.2% of the nurses said that they regretted choosing nursing as a job, while 43.2% felt a loss of motivation to work in a hospital and 72% thought that the educational program prepared them in a low to moderate degree for working in hospital.

Conclusion: According to the results it was the coworkers who could have a positive effect on new nurses; and they should advise, lead and support new co-workers, and not increase their stress by giving them too many responsibilities. Additionally, complete orientation time and provision of a support system is highly recommended.

Keywords: Work reality situation, new nurse's experiences, interactions.

MAN POWER DESIGN PROGRAM AND WORK REALITY SITUATION OF NURSES

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Introduction:

The new nurses first orientation experience has a critical role in forming their understanding of the role of a nurse in providing patient care, job satisfaction and creating chance to progress in this field. (Roberts, Lynn & Jones 2004). Zerwekh & Claborn (2000) state that 'as soon as a new-comer faces his/her first orientation experience, the role transition process begins. Strater & Decker mention that: Role transition can lead to clinical skill, personal growth, job satisfaction, organizational responsibility, competence, strength and professional socialization, if it is done effectively. On the other hand, ineffective role transition could result in decreased self esteem, appearance of dependant behaviors, diminished efficacy and occupational exhaustion. Kelly & Mathews(2001) also found that new graduates experience different sensations such as anxiety, tension, exhaustion, panic fear etc. In the process of role transition, Zerwekh & Claborn (2000) believe that many sensations are experienced during role transition which can affect one's physical and mental health status.

Ellis & Harthy (2000) express reality shock as another problem for graduates and state that it occurs when the new comer finds that providing favorable care is impossible because of existing limitations in the system. Duchscher (2001) also believes 'The paradox between those educations provided to graduates and those observed in real situations cause disillusionment, confusion and hopelessness in these groups'.

According to the above mentioned, it could be concluded that a critical part

of the role transition is related to care giving, responsibility and coping with colleagues and real situations.

Considering that nursing graduates are included in the human force project in our country, the necessity of the investigation is felt. The results of this study would help nursing teachers to prepare students for entrance into clinical field and facing the real work situation and nursing manager to create an appropriate and favorable environment for them. The principle goal of this study is to describe early experiences of non conventional nurses in academic hospitals related to universities of Iran, Tehran and Shahid Beheshti and the special goal of that is to determine nurses' experiences in doing their tasks, cooperation with other nurses and clinicians, and coping with work situations.

Hulsmeyer (1997) in a survey on role transition problems found that providing care for patients is one of the most important concerns for new graduates in the role transition period. Chitty (2001) states that the most important concern for new comers is the adaptation with colleagues and orientation group.

Methods:

This is a descriptive study about non-conventional nurse's experiences. The questionnaire was composed of two parts: firstly, demographic data and secondly, the experiences of nurses during their orientation period. The questionnaire validity and reliability was determined by content validity and test-retest methods, respectively.

Data collection was performed in a 2.5 months duration from 14 August to

27 October 2004. Data analysis was done by SPSS (version 10) software.

The statistical society is composed of nurses graduated with a Licentiate degree, who are passing Human Force Project period in academic hospitals related to 3 medical universities in Tehran and who have completed 2 to 6 months of their activities. 166 subjects were selected and data collection performed by questionnaire designed according to the finding of researchers working in role transition. The questionnaire was composed of two parts : firstly, demographic data and secondly, the experiences of nurses during their orientation period.

Results:

The findings revealed that of 166 subjects, 143 had encountered one of the problems listed in table-1. The results showed that nurses used different ways to overcome their problems including taking information via counseling or asking colleagues (86.3%), using references and text books to increase their fund of knowledge (56.2%) asking help from colleagues (49.7%) participation in re-educating programs (9.2%). Additionally, nurses reported positive results due to increased knowledge by study and asking (74.5%), improved clinical skills (72.5%) and learning new skills from colleagues (68%) more than negative results, significantly (table-2).

95.2% of study units were females, 65.1% of them being single and 31.9% married, of whom 4.8% had children. 49.4% of the study population had graduated from a government university and 46.4% from another university, with the remaining population from Army and National Bank universities. 87.3% had graduated in 2003. 55.42% worked in internal surgery wards, 26.53% in ICU, CCU and Emergency wards, 14.45% in pediatric and neonatal wards and 3.6 % in obstetrics and gynecology wards.

33.7% had not passed the preliminary period and the remaining had completed a 1 day to 1 month period. 89.7% of the subjects were in rotation and 24.7% had a history of scholarship activity in this field, 1.8% having worked concurrently in a different hospital.

Results for the third objective of our study, determination of nurses experiences on facing the real job conditions,

showed that most of the subjects would decrease their free time when encountered with time insufficiency(81.3%), furthermore most of the nurses (n=136) expressed higher fatigue levels (81.9%).

When encountered with time insufficiency (81.3%). Additionally most of the nurses (n=136) expressed higher fatigue (81.9%) when dealing with the paradox between academic values and real conditions. Most of the subjects would agree (72.9%). the results showed that most cases had dealt with obligatory unrelated activities (68.7%) and delegated extra time duties. (62%). (table 4).

In the case of nurses' experiences regarding cooperation with other nurses and clinicians, the results revealed that more than half of them (58.4 to 88.6%) had encountered different supportive behaviors from other nurses but the number was lower for clinicians.(10.8 to 38%) (Table 3).

The findings also showed that less than half of nurses (25.5 to 48.8%) had faced different annoying behaviors (criticism, reproach from other nurses and an even lesser number (11.4 to 24.1%) by clinicians. In the case of supportive behaviors, the majority of nurses indicated decreased stress and work load (64.6%) and rapid adaptation with work place (62.1%), and in the case of annoying behaviors, most of the subjects mentioned increased tension and stress (63.9%) and loss of interest in the job (52.4%).

The results showed that most cases had dealt with obligatory unrelated activities (68.7%) and delegated extra time duties(62%). (table 4).

Discussion:

According to our results, 24.7% of nurses had faced expectations without enough training and 30.7% had encountered demands that would be undertaken by an experienced nurse. (Table 4)

It seems, therefore, that managers expect inappropriately high capacities from new nurses and this ignores the fact that is is their preliminary period when difficult tasks should be avoided. Findings reveal that nurses look at the human Force project as a period which causes loss of motivation

to work in hospital (43.9%), remorse at selecting such a profession (45.2%), feelings of mental exhaustion (42.8%), anxiety and stress about work (41.5%), hopelessness and disillusionment in real situations (39.8%), incompatibility with work in hospital, trends toward leaving the job after the end of the period (32.3%) and decreased physical fitness (31.9%). These results indicate that role transition have occurred ineffectively for them and as mentioned before, ineffective role transition causes lowered self esteem, physical and mental exhaustion, dissatisfaction and occupational determination.

According to the results, most subjects expressed loss of enough staff (91%) and facilities (68.1%) as a preventive factor to provide efficient care for the patients. In a survey conducted by Salehi, Abedi, Alipour, Najafipour and Fatehi (2001) on the difference between clinical care and academic education in Isfahan, the participants who had worked from 5 months to 6 years described internal motives as the most effective factor in conjoining these elements. It seems, therefore, that new nurses have more motivation to maintain values and standards at the beginning but it decreases after a while, through loss of support and criticism for spending time on patient care. Another problem most nurses dealt with, was forcing them to do more than needed.(62%). This was mentioned not only by participants but also by two managers of the studied hospitals. That is due to loss of adequate staff. Indeed, workload is transmitted to non conventional nurses, and leads to engagement of such human forces into hospital activities without passing a preliminary period.

Kelky (1996) and colleagues supports that this is related inversely to work stress. Findings in table 5 are in accordance with other researchers. Duchsher (2001) and Derman & Moffit-Wolf (1997) found in their study, that interaction with colleagues who treat you unfavorably causes stress and anxiety in new graduates. Therefore based on the results in table 5, it could be concluded that inappropriate behaviors of hospital staff, particularly nurses and clinicians, increases work load and stress and diminishes interest in the job among new graduates. If intolerable for nurses such conditions force them to change their working

schedules or workplace to avoid confronting these disturbing staff.

According to the results, nurses had to deal more with loss of enough skilled workers, equipment to use (37.3%), forcing new conditions on them, 36.1%); loss of familiarity with routines (33.1%) (table 1). Additionally, based on the results, one third of study units had entered the workforce without passing; more than one third with only 2 weeks training and the remainder with between 14 to 30 days of the

preliminary period, (36.2 and 30.1% respectively).

Additionally the study population had encountered more disturbing and supportive behaviors from other nurses than clinicians. It could be caused by spending more time in cooperation with nurse fellows. Most nurses (62.1%) linked the fall in tension and stress to supportive behaviors and increased stress to disturbing behaviors. (63.9%) Our findings confirm the results of others.

According to the results, most subjects used data acquired by counseling and asking colleagues (86.3%) to overcome new problems. Thus it could be concluded that colleagues are the most important factors for newcomers to deal with over occupational difficulties. So, one can say that dealing with different problems has resulted in more positive experiences for this group (table 2).

Table 1. Frequency distribution of the problem according to the exerted task and sex

Cases -Sex	Female		Male		Total		Fisher Test-P
	Number	Percent	Number	Percent	Number	Percent	
Insufficient knowledge of care	33	21/7	3	37/5	36	21/7	0/373
Insufficient skill of care	45	28/5	3	37/5	48	28/9	0/692
Insufficient skill to use equipment	57	36/1	5	62/5	62	37/3	0/151
Loss of enough self esteem	16	10/1	3	37/5	19	11/4	0/049 ^a
Insufficient skill for time management	22	13/9	0	0/00	22	13/3	0/500
Loss of appropriate concentration in task	17	10/8	1	12/5	18	10/8	1
Loss of communication skill with staff	7	4/4	1	12/5	8	4/8	0/332
Loss of communication skill with patients	8	5/1	2	25	10	6/0	0/075
Disfamiliarity with routines	53	33/5	2	25	55	33/1	1
Experiencing a new condition in the ward	57	36/1	3	37/5	60	36/1	1

p means significant

Table 2. Frequency distribution of the result from dealing with problems by the nature of result and age.

Cases -Sex	Female		Male		Total		Fisher Test
	Number	Percent	Number	Percent	Number	Percent	
Increased knowledge by counseling	107	73/3	7	100/0	114	74/5	0/192
Improved clinical skills	105	71/9	6	85/7	111	72/5	0/674
Improved new skills from colleagues	98	67/1	6	85/7	104	68/0	0/431
Learning new skills from colleagues	74	50/7	4	57/1	78	51/0	1
Increased motivation for learning and acquiring information	10	6/8	2	28/6	12	7/8	0/095
Sense of time wasting to ask help or questions	6	4/1	0	0/00	6	3/9	1
Depending on colleagues skills	6	4/1	0	0/00	6	5/9	1
Sense of inability to work in hospitals	8	5/5	1	14/3	9	5/2	0/325
Decreased self esteem	7	4/8	1	14/3	8	17/6	0/319
Increased fatigability	27	18/5	0	0/00	27	3/9	0/354
Sense of uselessness and worthlessness	6	4/1	0	0/00	6	9/2	1
Sense of dependency on working	14	9/6	0	0/00	14	28/8	1
Sense of disappointment for chances that are wasted	40	27/4	4	57/1	44		0/105

Table 3. Frequency distribution of supportive behaviors from nurses and clinicians by the type of behavior and sex.

Cases -Sex	Male		Female		Total		Fisher Test
	Number	Percent	Number	Percent	Number	Percent	
Respect to speaks and ideas of coworkers	8	100	122	77/2	130	78/3	0/203
	3	37/5	60	38	63	38	1
Guidance in the process of learning	8	100	133	84/2	141	84/9	0/630
Appreciating and rewarding nurses in the process of patient care	6	75	91	60/8	97	58/4	0/471
	1	12/5	32	20/9	33	19/9	1
Warm approach toward new nurses	5	62/5	122	77/2	127	76/5	0/393
	3	37/5	60	38/0	63	38/0	1
Attention to nurses ideas	5	62/5	115	72/8	120	72/3	0/686
	3	37/5	24	15/2	27	16/3	0/122
Appropriate feedback and on time criticism	7	87/5	93	58/9	100	60/2	0/147
	1	12/5	20	12/7	21	12/7	1

P, means significant

Table 4. Frequency distribution of workplace conditions by the nature of condition and sex

Cases -Sex	Male		Female		Total		Fisher Test
	Number	Percent	Number	Percent	Number	Percent	
Loss of referring to staff ideas about work	48	30/4	3	37/5	51	30/7	0/702
Dependency in program designing for health cares	19	12/0	2	25/0	21	12/7	0/267
Over expectation about new nurses	14	8/9	1	12/5	15	9/0	0/539
Exerting excessive tasks on nurses	46	29/1	5	62/5	51	30/7	0/059 ^o
Expectation of performing well without passing preliminary period	96	60/8	7	87/5	103	62/0	0/261
Expectation of doing unrelated tasks	39	24/7	2	25/0	41	24/7	1
Decreased self esteem	107	67/7	7	87/5	114	68/7	0/437

P means nearly significant ^o

Table-5 Frequency distribution of the results from inappropriate behaviors by the nurses dealing with them and by sex.

Cases -Sex	Male		Female		Total		Fisher Test
	Number	Percent	Number	Percent	Number	Percent	
Increased stress	89	63/6	5	71/4	94	63/9	1
Decreased interest	73	52/1	4	57/1	77	52/4	1
Decreased self esteem	31	22/1	2	28/6	33	22/4	0/654
Trend toward leaving job	66	47/1	4	57/1	70	47/6	0/709
Fear and anxiety about dealing with coworkers who treat inappropriately	48	34/3	5	71/4	53	36/1	0/099
Change in work schedule to avoid facing bad coworkers	49	35/0	4	57/1	53	36/1	0/253
Change in work place to avoid facing bad coworkers	34	24/3	4	57/1	38	25/9	0/074
More concentration on exerted tasks	66	47/1	4	42/9	69	46/9	1
Try to perform the task timely and exactly	59	42/1	3		62	42/2	1

166 person were investigated from witch 147 person was encountered with inappropriate behavior.

FACTORS INFLUENCING FAMILY VIOLENCE AND SPOUSAL MURDER IN THE CITY OF TEHRAN

ABSTRACT

Introduction: This research was conducted to illustrate relevant causes of spousal homicide, such as improper family tradition, legal discrimination, lack of information about laws, difficulties in access to the judicial system, lack of appropriate experts/consultants and psychological problems.

Objective: The objective of this study was to address two fundamental questions: What are the reasons for spouse killing? What solutions can be presented in order to overcome this problem? By considering pertinent criminal cases presented in courts and prisons in Tehran, this research attempts to discuss the factors relating to spousal homicide.

Materials and Methods: The method of this research was based on quantitative and qualitative research. For data collection, a questionnaire was used. 50 prisoners were asked to participate. Moreover, interview has been used with spouse killers in 3 prisons in Tehran. Furthermore, this study has taken into account the interviews given by lawyers, judges, and consultants.

Findings: The outcome of this research points out that there is little difference among spouse killers as far as family, social and educational factors are concerned.

Conclusion: The crucial factors in committing this crime are economic problems, lack of information as to legal affairs, lack of information as to protective centres, legal cost, imposed and early marriage, age difference and existing problems of divorce.

Keywords: Homicide, Domestic violence, Legal discrimination, Imposed marriage.

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Introduction:

Harming the spouse is one of the main problems of most societies. This study has been implemented with the aim of specifying the reasons and factors of killing the spouse and some elements such as legal and family bottlenecks. Violence in the family such as harming the child, the spouse, or aged persons has attracted attention considerably since 1970.

Violence in the family such as "harming the wife", is the common and destroying phenomenon, and the statistics show the depth of this problem. Every year millions of women and children in the world are the sacrificed persons of the family violence. More than two million women every year in the U.S.A. are harmed by their husbands [1], and it is estimated that one third of all women during the period of their adolescence has been threatened by their husbands [2 & 3]. According to the evidence of the Supreme Court of the U.S.A., women are the sacrificed persons of the family, eleven times more than men.

Saunders and colleagues [4] studied 165 persons committing violence and have come to the conclusion that in 52% of cases, the persons that have committed the violence have been only at home, 29% are general committers of crime, and 19% persons in an unstable condition, due to alcohol.

Rosen [5] by implementing a study consisting of 277 cases, has obtained results such as 25% of such persons have committed violence at least once in the recent relations. 28.2% have reported that minimum once have been the sacrifice of physical violence. The results show that 40% of the participants have at least been the victim of physical

violence of their parents in childhood and 32.9% have witnessed at least once, physical violence between their parents in childhood.

Cyr and colleagues [6] in their research have shown that there is a meaningful relationship between committing of violence in marriage and becoming a childhood victim of such by one of the parents breeds aggressiveness and violence in the next generation.

Nazparvar [7] has conducted research under the title of "harming women". In this research by using the random samples consisting of 100 women who have been harmed by their husbands and 70 persons in a comparative group who for other reasons had been referred to the medical examiner. The results showed that the most common reasons of family quarrels in the first stage have been the moral and behaviour problems and then the interference of the others, especially the family of the husband, and then economic problems.

Zanganeh and colleague [8] found that the variables of age difference of the couples, the interference of the family and the relatives of the couples, the experience of seeing the violence of the parents by the couples in the family, the educational level of the husband, are positive relations with the different violence of husbands against wives.

The results of Moazami's [9] research in the case of violence against women show that half (51%) of the women who have suffered from violence have nervous and migraine headaches. 18% of them have the effects of temporary or permanent strokes or burns. 9.2%

are affected with venereal diseases and 7.1% have stomach ache or other harm such as miscarriage due to being beaten, heart disease and so on.

In case of the biological, psychological and physiological elements, many studies have considered the important relationship between these elements and the violence of men. Also mental analysis of Freud, the theory of behavior [10], inter-generation transfer, disappointment and aggressiveness, identification, individual differences, have been discussed in analyzing family violence.

Belski and Daton state that the environmental models have been considered in four stages and each stage enters the next stage and due to this, it is also called environmental network. In the first stage the individual growth and the experiences of childhood which show violence operations or being the victim of violence are taken into consideration. In the second stage the family environment and its internal relationships are taken into consideration. In the third stage, the external considerations and the official and non-official structure of society, especially that which has influence on the fragments of the society, are taken into account. In the fourth stage the macro environment, which consists of the cultural and belief values are considered. In reality in case in which a culture promotes or tolerates violence, people have no reason to pursue these values [11].

Research conducted in 15 provinces of the country shows that 33% of killing by husbands has been the reaction to violence; in 67% of killing by husbands it has been due to disloyalty to the man. 48% of the men have expressed the reason as suspicion, 35% fanaticism and jealousy and the existence of the third person, and 13% due to not paying attention to the spouse and the children, and disinterest and making excuses and sexual disorder has been the other reasons [12].

Materials and Methods:

In order to study on the subject

of in order to study the subjects of spouse killers and to identify the different reasons, the combination of two methods of survey and intensive interview has been used. In our survey method, for collecting data, a questionnaire has been used. The most submitted questions in the questionnaire provide the possibility of identifying the subjective meaning, and also the possibility of measuring the variables in interval level, using statistical tests. The sample under study is 50 prisoners in Evin, Rajaii Shahr and Varamin prisons.

The interviews were conducted in half an hour, and they focused on the subject of the research. The application of two methods in parallel, resulted in the designing of the questions and provided more insight. In addition the interviews were also implemented in the light of data resulting from the work of researchers, which were consistent with the sample of the society under study. For face to face interview, due to a relatively good opportunity because of the presence of watchmen, questions from the murderers of women accused of killing their wives were asked and their wishes, desires and the real motivation were heard. They were also conducted away from the inspectors in mutual confidence.

Findings:

The collected data in different ways has been reviewed and by using the proper statistical techniques, the questions of the research have been investigated. The sample under review has been consisted from 80% of men and 20% of women. Also 50% of the sample has been in age group 20-30, 40% in age group of 31-40 and 10% in age group of more than 40. 80% of the people who answered had education below diploma, 14% had diploma and associate of arts, and 6% had B.A. degree. In case of the number of dependant person, 40% had dependant persons less than 3, 20% between 3 to 5, 10% more than 5, and 30% did not answer this question. In case of the number of the children, 8% had no children, 20% had one child, 32% had 2 or 3 children, and 22% did not answer this question. In case of the employment

situation, 12% had free job, 16% were workers, 2% were employees, 20% had services work, 4% had professional jobs, 36% unemployed, and 10% did not answer this question. In case of economic income, 60% had low income, 30% had medium income, 4% had high income and 6% did not answer this question. In case of job satisfaction before committing murder, 34% answered positively and 62% answered negatively and 4% did not answer this question. In case of health situation, 80% were healthy, 6% were ill, 8% had addiction and 6% did not answer this question. In case of residential places before committing the crime, 20% were residing in the north of the city, 26% in the middle of the city, 38% at the south of the city, 10% in the margins of the city and 6% did not answer this question. In case of the period of marriage before committing the crime, 10% had been less than 6 years, 10% between 6 months and one year, 50% more than one year and 30% did not answer this question. In case of type of marriage, 60% had permanent marriage, 6% temporary marriage and 34% did not answer this question. In case of the turn of marriage, 60% had been for the first time, 14% for the second time and 26% did not answer this question. In case of penal record, 20% had the record of theft, 52% had the record of beating, 6% had the record of destruction, 12% had the record of insult and calumny, 2% had the chastity crimes and 8% had mentioned other cases. In case of the type of crime, 24% had intention to beat, 60% had done the crime intentionally, 12% had done the crime without intention and 4% did not answer this question. In case of amount of freedom in choosing and type of marriage with spouse, 60% answered very little, 20% little, 10% at an extent, 6% a lot, and 4% too much. In case of family harshness record at the time of childhood, 8% answered very little, 4% at an extent, 16% a lot, and 64% too much. In case of divorce record among the members of the family, 8% had answered very low, 30% low, 10% at an extent, 20% a lot and 32% too much. In total the persons who had answered the questionnaires have stated that in confronting with anger have used threatening, beating,

cursing and then jackknife or weapon respectively. The reason and the motivation of committing crime have been specified in the following table:

Table 1. Comparison of Mean of the Reason & Motivation of Criminal Action

Responses	Mean
Instant insanity	4.08
Financial problems	3.8
Being beaten & cursing	3.78
Addiction	2.28
Being pessimistic & jealousy	2.26
Disloyalty	2.06
Defending from chastity or the child	2.06
Mental imbalance	2.02
Polygamy	1.46
Revenge	1.46

The calculated mean shows that in total the persons who have answered have expressed the reason of their criminal action as instant insanity, financial problems, being beaten and cursing, addiction, being pessimistic and jealousy, disloyalty, defending from chastity and the child, mental imbalance, polygamy and revenge respectively.

The amount of implementing each of the measures after a quarrel with the spouse, consisted of sulking, disconnection of relations with his family, financial non-compliance, sexual

non-compliance, hidden relations, thinking about divorce, thinking about murder have been reviewed in the following table:

Table 2. Comparison of Mean of Implementing any Measures After Quarrel

Responses	Mean
Thinking about divorce	4.26
Sulking	4.08
Sexual non-compliance	4
Disconnecting relations with family	2.74
Establishing hidden relations	2.46
Financial non-compliance	2.06
Thinking about murder	1.6

The calculated mean shows that the total persons who have answered, after each quarrel have implemented the following measures: thinking about divorce, sulking, sexual non-compliance, disconnecting relations with the family of spouse, establishing hidden relations, financial non-compliance, thinking about the murder of spouse.

At the time of deciding about murder, the persons who have answered have thought to use murdering instruments consisted from cutting instruments, wire, physical attack, rope and wire

Table 3. Comparison of Mean of Using Murdering Instruments

Responses	Mean
Cutting instruments	3.54
Wire	3.26
Other	3.02
Rope & wire cable	2.24
Physical attack	2.1

The calculated mean shows that in total the persons who have answered, at the time of deciding to commit murder have preferred the following murdering instruments respectively: cutting instruments, wire, other murdering instruments, rope and wire cable, physical attack.

The criminal action has been implemented with the assistance or the guidance or the participation of another person.

Table 4. Comparison of Mean of the Method of Implementing Crime

Responses	Mean
Alone	3.12
By the assistance or the guidance of another person	1.56
By the participation of another person	1.38

The calculated mean shows that in total the persons who have answered have implemented their criminal action as the following: alone, with the assistance or the guidance of another person, with the participation of another person.

Also the persons who have answered have stated their desire for murder and their previous intention at the medium level. Meanwhile, they have showed different reactions after murder.

Table 5. Comparison of Mean of Reactions After Murder

Responses	Mean
Regret & sadness	4.2
Hiding the murder scene	4.02
Thinking about escape	3.74
Thinking about committing suicide	2.26
Introducing to the disciplinary power	1.38

The calculated mean shows that in total the persons who have answered after murder have implemented the following measures: regret, hiding the murder scene, thinking about escape, thinking about committing suicide, Contacting to the disciplinary power.

The persons who have answered have expressed their satisfaction from the method of investigation and trial in the court, very low (78%), low (12%), to an extent (6%), high (2%), and very high (2%).

40% of the persons who have answered this research have expressed their guilt, 40% in a very low level, 20% in low level, 26% to an extent, 10% high and 4% very high. Also the persons who have answered have stated that in case of not committing murder, they would choose another solution such as referral to consultancy centers, referral to legal centers and juridical authorities, consulting with friends and relatives or abandoning the house.

Table 6. Comparison of Mean of Choosing Another Solution with the Exception of Murder

Responses	Mean
Referring to the consultancy centers	1.5
Referring to the legal or juridical centers	4
Consulting with the family or friends	3.78
Abandoning the house	3.52

In total the persons who have answered in case of total the persons who have answered in case of choosing another measure with the exception of murder have considered proper the following measures respectively: referral to legal and juridical centers, consulting with family and friends, abandoning the house, referral to consultancy centers.

The persons who have answered have considered the following solutions in decreasing or prevention of family murders:

Considering crime the harsh action in the limit of very high (84%), establishment of governmental and non-governmental protection centers (in medium level) establishment of consultant telephone lines in the limit of high and very high (76%), the emergency reviewing of family problems in the courts in the limit of low (26%), immediate interference of the disciplinary power in the family problems in the limit of very low (0.36%).

In this research the persons who have answered have considered their success in using attorneys and consultants free as a solution for decreasing family murders has expressed in the medium level.

Table 7. Comparison of Mean of Decreasing or Preventing from the Family Murders

Responses	Mean
Considering the implemented harshness as crime	4.78
Establishing protection centers	3.26
Availability to consultancy possibilities	4.1
Emergency in investigating into the family problems	2.4
Immediate interference of the disciplinary power	1.9
Facilitation in using the attorneys & consultants	3.46
Reports of the treatment centers	2.22

The results show that the respondents expressed their approval with the submitted solutions as the following: considering crime the harsh action, availability to consultancy possibilities, facilitating the usage of attorneys

and consultants, establishing centers for protection, emergency in investigating family problems, the report of treatment centers, immediate interference of the disciplinary power.

In the case of the elements related to hurting the spouse and her murder, three essential elements affecting murder and hurting the spouse, i.e., social elements, legal elements and family elements are being analyzed. Among these three social, family and legal elements, the social elements with the average of 3.72% out of 5 had the most influence on the occurrence of family murders.

For the identification of different dimensions of killing a spouse, intensive interview method has been used. 45 interviews with women in prison in Tehran, and 8 interviews with people in case of the subject of violence and killing the spouse has been implemented.

The results of the intensive interviews consisted of the conditions and behavior and the sense of modesty and sorrow, distraction, crying, nervousness and becoming angry, inattention, nervous laughs, playing continuously with hand and paper, taking the condition of madness, having make-up and being fresh, shyness and looking oppressed, being impatient, drowsiness, having hope, giving importance to the appearance and the cleanness of clothes, the way of talking (calm or with high voice) using improper words, and the characteristics of the interviewee persons such as age, education, marital status, employment situation, social class, number of children, and the type and times of marriage, the penal record and the record of addiction.

Of course most of them had requested help and had no satisfaction from their situation and mostly were trying to attract help and prove their innocence.

The findings of these interviews show that most women had imposed marriage, and had confronted violence from the side of their husbands. Their personality and their human identity had been overlooked, and they had endured their life due to their children and the economic problems, the rotation of this violence and eventually they could not bear their life and had put an end to the life of their husbands.

Also husbands had killed their wives by mistake due to suspicion and jealousy.

Most of the women had regret about the murder act but not the murder of their husbands, because they deserved murder. But most men were sorry because they had vain suspicion and some of them thought that they deserved to be murdered. By reviews implemented from these interviews, it was revealed that most of the women that were in prison accused for killing their husbands had done murder with the assistance of another person. These women that had faced the tortures of their husbands had established relations with another person for taking revenge, and fulfilling their wishes and as the husbands had been a great obstacle for them, they had planned to kill their husbands and in this way the other men had helped them to kill their husbands without knowing what will be their future. In reviewing the life of these women it

was specified that most of these traitor women were due to the circumstances of having bad, unemployed and addicted husbands and who had to become a prostitute and eventually they had become tired of this situation and by the assistance of one of their customers had committed the murder.

Also a number of persons with the education of judicial law and in the position of judicial consultant in the family courts participated in the interview and stressed on removing the legal bottlenecks that are in the way of preventing the murder of spouse.

Conclusion:

Killing the spouse is an intense type of violence. Usually those who commit violence do this action in the continuation of persistent dissatisfaction which is the result of different elements. Limitation for fulfilling the rights of the woman from the legal channels in our society forces some women to enter into action, and for removing their husbands make a plan for their murder. But some men due to their disposition and being free with the least dissatisfaction or foul play in the relations commit violence, and due to instant madness (that according to the reports of the medical examiner commissions and psychologist have been in normal conditions and there has not been prior signs of madness in them) in a moment had decided to kill their spouse.

80% of the implemented murders by women had been done due to fear of husband, repeated humiliation and sexual harm. The women killing their husbands with a prior plan and during the period of enduring living conditions, have murdered their husbands personally or with the assistance of another man. Poverty, being jobless, addiction and treachery have been the cases that have resulted in killing of the husband in Iran. Most women killing their husbands have suffered from lack of affection. 95% of the women after killing their husbands have not regretted it, but even in investigations have announced that in case the time could be returned to the past they would kill their husbands. While, most

of the men have expressed regret after killing their wives.

The most important reason of killing spouse has been due to continued dissatisfaction with life, and the spouse, because of beating, addiction of the husband, failure in divorce and the existence of legal gaps that has resulted to be less bearable in respect of the existing conditions and under non-rational conditions have committed the crime. One of the reasons has been derived from a sense of revenge when during the confrontation of the woman with the treachery of the husband and establishing unlawful relations with the other woman. This matter is due to the permission of lawmakers for permanent polygamy and choosing numerous wives on the basis of temporary marriage for the men that in case this matter would be prohibited by law, and at least conditions and limitations would be created or the right for divorce and other rights would be given to the wives against this matter, the scope would be decreased, and this natural jealousy of women which is the reason for revenge would be diminished. The lawmaker gives permission to the men to commit murder and not to be punished, but in case of the flame of envy in a woman is fired, and she commits murder and take revenge on her husband, itshe is treated as an innate killer.

The last type of violence by women who kill their husbands is related to the unlawful relations of the woman due to different reasons, such as lack of sentimental or mental elements in married life, that results in the establishment of hidden relations with others and the continuation of these relations are against the law and the custom of the society, and are contrary to them, and she implements the plan of killing the husband and in most cases with the assistance of the other person.

The increase in the amount of contradictions and the boundary of freedom of the person, sometimes results in such a level of disputes, that each of the couples pursue a solution for escaping from the existing situation and attaining to the desired needs and while there are many ways for the men to exit from the conceivable dead

ends, the women are caught in the contradictions and limitations and pursue ways for emptying their intense sentiments against their husbands and rescue themselves and therefore, kill their husbands.

By the diminshment of affection inside the family and the numerous economic and social problems that result in carelessness to the mental conditions of the members and under these conditions the existence of "substitute love" for filling the gap of sentiments and the formation of illegal relations which is accompanied with the torture of conscience, the way of these people leads to planning murder.

Also the protection system from these kind of tortured women in the house of the husband is not clear in society, and in most cases, it is for the benefit of the men. Therefore, the women get into a situation where they commit crime.

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STEPS TOWARD EBM/ GUIDELINE FOR IRAQI MEDICAL AND NURSING SCHOOLS: PREVENTION AND TREATMENT OF IRON DEFICIENCY ANAEMIA IN IRAQI PREGNANT WOMEN

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1. Purpose and Scope:

Anaemia is the commonest medical disorder in pregnancy and has a varied prevalence, aetiology and degree of severity in different populations, being more common in developing countries. Iron deficiency anaemia is the commonest nutritional deficiency in pregnancy followed by folate deficiency. Over 50% of pregnant women in developing countries suffer from iron deficiency anaemia, and in these countries anaemia is frequently severe and can be expected to contribute significantly to maternal mortality and morbidity.

The aim of this guideline is to assess the evidence regarding the prevention and management of anaemia in pregnancy, particularly iron deficiency anaemia. It assesses also the advisability of routine iron supplementation during pregnancy and the adolescent girls who soon will get pregnant. The objective of this guideline is to reduce the maternal and perinatal morbidity and mortality rates.

2. Identification and assessment of evidence

The Cochrane Database and Medline were searched using the terms - anaemia; iron deficiency; pregnancy.

Where possible, recommendations are based on, and explicitly linked to, the evidence that supports them. Areas lacking evidence are highlighted and annotated as 'Good Practice Points'.

3. Background

Iron deficiency is defined as a condition in which there are no mobilizable iron stores, causing a compromised supply of iron to tissues (including the red blood cell). The more severe stages of iron deficiency cause anaemia. Iron deficiency is estimated as being 2-5 times more common than iron deficiency anaemia.

Iron deficiency anaemia is the main cause of microcytic hypochromic anaemia, in which mean cell volume (MCV), mean cell haemoglobin (MCH) and mean cell haemoglobin concentration (MCHC) are all reduced, and the blood film shows microcytic hypochromic red cells. Haemoglobin is more than 2 standard deviations below the mean for a population of healthy people of the same age and sex. This represents a level of less than 13 g/dl for men and less than 12 g/dl for women (less than 11 g/dl in pregnancy).

In developed countries it is most commonly due to blood loss: Menorrhagia in premenopausal women; gastrointestinal bleeding in men and postmenopausal women; other causes are iron-deficient diet and malabsorption (e.g. coeliac disease).

In developing countries several factors may combine: Poor diet; Increased requirements (e.g. frequent pregnancy); blood loss due to menorrhagia and gastrointestinal bleeding (e.g. hookworm, trichuriasis, amoebiasis and schistosomiasis); and haemolysis due to malaria or haemoglobinopathies 1,2,3.

How common is it?

Iron deficiency anaemia is the most common type of anaemia in all countries. It affects up to 30% of the world's population, with prevalence in developed countries of about 8%. The most common cause in developing countries is hookworm infestation; it is estimated that a billion people are infected worldwide⁴.

It occurs during pregnancy in 23% of pregnant women in developed countries, and 52% of pregnant women in developing countries 1,2,.3.

4. How can the diagnosis be made?

4.1 Which symptoms may be present?

Symptoms may be few if the anaemia develops gradually, but are typically: fatigue; breathlessness; palpitations; headache; tinnitus; unusual dietary cravings (pica).

4.2 Which signs may be present?

Pallor of eyelids, tongue, nail beds and palms; atrophic glossitis and angular cheilosis (also signs of megaloblastic anaemia and riboflavin deficiency, respectively); brittle, longitudinally-ridged, flaking nails and koilonychia (spoon-shaped nails) in chronic cases; dysphagia (due to an oesophageal web - Plummer-Vinson syndrome); hair loss; splenomegaly; tachycardia, murmurs, cardiac enlargement, and heart failure (if severe anaemia).

4.3 Which investigations are useful in the diagnosis of iron deficiency anaemia?

Full blood count: Low haemoglobin (Hb) concentration, less than 12 g/dl for women; low MCV, MCH, and MCHC (mean cell volume, mean cell Hb, mean cell Hb concentration); reticulocyte count low for the degree of anaemia; there may be a mild thrombocytosis (raised platelet concentration).

Blood film: microcytic hypochromic red cells, with occasional target cells and pencil-shaped poikilocytes.

Serum ferritin level: low (an indicator of reduced body-iron stores). However, as ferritin is an acute-phase protein, levels may be normal or elevated in infective, inflammatory or malignant disease despite iron deficiency. Serum ferritin level is also increased by excessive alcohol consumption.

Erythrocyte protoporphyrin: increased with iron deficiency, and correlates well with a reduced ferritin level. However, levels can also be increased by infection, inflammation, lead poisoning, and haemolytic anaemia.

Serum iron and transferrin (total iron-binding capacity [TIBC]): reduced

serum iron and increased transferrin, with a consequent reduction in transferrin saturation. However, there is a marked diurnal variation, and a considerable overlap between iron-deficient and normal people.

Serum transferrin receptors: a relatively new test that is not widely available. Raised in iron deficiency. Its major advantage is that it is not affected by infection or inflammation, and does not vary with age, sex or pregnancy. It is, however, elevated by increased red-cell production or turnover (e.g. haemolytic anaemia). There is a lack of standardization of the different methods available.

Bone-marrow aspiration: rarely needed, but will show absent bone-marrow iron stores.

4.4 How are these investigations affected by pregnancy?

Full blood count: in pregnancy a physiological reduction in Hb concentration occurs, which does not represent anaemia. There is an increase in red-cell mass and plasma volume; the plasma volume increases more than the red-cell mass, causing the Hb reduction.

There is a lack of agreement on the Hb level for the diagnosis of anaemia during pregnancy:

The World Health Organization (WHO) defines anaemia as an Hb level less than 11 g/dl throughout pregnancy (this is the most widely used definition worldwide).

The American Centers for Disease Control and Prevention modified this by trimester of pregnancy: First-trimester Hb level less than 11 g/dl; second-trimester Hb level less than 10.5 g/dl; third-trimester Hb level less than 11 g/dl.

MCV: increases by approximately 4 femtolitres in pregnancy (whether iron deficient or not).

Serum ferritin level: considered a reliable indicator of iron deficiency in the first trimester (in the absence of infection, inflammation or excessive alcohol consumption); however serum ferritin level falls in the second and third trimester independent of iron stores. But in general, iron deficiency was defined as serum ferritin <12 mug/l and iron deficiency anaemia as serum ferritin <12 mug/l and Hb <5th percentile in iron replete pregnant women 5.

Erythrocyte protoporphyrin: this fluctuates less than ferritin throughout pregnancy, and may be more useful than ferritin in the second and third trimester. But it is not available in all centres.

Serum iron and transferrin (total iron-binding capacity [TIBC]): these tests have a low sensitivity for the diagnosis of iron deficiency during pregnancy; in addition, normal ranges for pregnancy have not been firmly established.

Serum transferrin receptors: this test has potential use as it is not affected by pregnancy; however it is not yet widely available. 1,2,3,6,7,8,9

Evidence level Ib

Evidence Level IV

4.5 What else might it be?

Other anaemias that may be mistaken for iron deficiency anaemia:

Anaemia of chronic disorders: inhibition of release of iron from macrophages to red-cell precursors results in a normocytic or mildly microcytic anaemia (serum iron and total iron-binding capacity [TIBC] both reduced, serum ferritin normal or raised). It does not respond to iron therapy.

Other causes of impaired haemoglobin synthesis and microcytic anaemia: Sideroblastic anaemia - refractory hypochromic anaemia, with ring sideroblasts and increased iron in the bone marrow.

Thalassaemia trait (alpha or beta) - a hypochromic microcytic anaemia, the mean cell volume tends to be particularly low for the degree of anaemia 9,10.

5. How should we manage the pregnant women with iron deficiency anaemia?

5.1 What are Complications and prognosis?

Complications: Increased morbidity from infectious disease, due to adverse effects on the immune system; heart failure; angina.

Complications specific to pregnancy: Increased maternal mortality; increased prenatal and perinatal infant mortality; increased prematurity; and infants born to iron deficient mothers require more iron than is supplied by breast milk, and at an earlier stage, to avoid iron deficiency 3.

5.2 How can search for the cause of iron deficiency anaemia?

Difficulties in diagnosis may occur when more than one type of anaemia is present. A dimorphic blood picture may be present, and additional investigations such as vitamin B12 and folate levels may help diagnose the different causes of anaemia.

A reason for iron deficiency should always be sought. History taking should attempt to determine whether gastrointestinal (GI) blood loss, menstrual loss, malabsorption, or nutritional deficiency is likely. Drug history of non-steroidal anti-inflammatory use is particularly important, as this might point to possible GI bleeding.

In developed countries dietary deficiency, by itself, is rarely a cause of iron deficiency anaemia unless there are increased physiological demands for iron (e.g. during infancy, adolescence, pregnancy, lactation, and in menstruating women).

But iron deficiency anaemia tends to be 3-4 times higher in non-industrialized than in industrialized countries.

Both upper and lower GI investigations should be considered, because of the high incidence of pathology (except possibly in premenopausal women with heavy periods).

A study of people with iron deficiency anaemia and no obvious cause from history found that 84% had a GI cause of blood loss: 28% due to upper GI pathology alone, 27% due to lower GI pathology alone, and 29% due to

dual pathology 11.

Coeliac disease has been found to be the cause in 2-3% of people presenting with iron deficiency anaemia.

The definitive test for coeliac disease is a small-bowel biopsy; these should therefore be taken during upper GI endoscopy 12.

Haematuria is an uncommon cause of iron deficiency anaemia and is usually clinically obvious.

Stool examination should be considered in people with a history of travel to the tropics, in order to exclude hookworm infestation, which is the commonest cause of iron deficiency anaemia worldwide 1,9.

5.3 How could treat iron deficiency anaemia during pregnancy?

Not enough evidence is known as to the best way to treat iron deficiency anaemia in pregnancy.

Recommendations for the treatment of anaemia are currently based on expert opinions rather than systematic reviews of randomised clinical trials.

There is controversy around the significance for women and their babies, of the physiological haemodilution of pregnancy and at what level of haemoglobin women and babies would benefit from iron treatment. Some studies suggest that the physiological decrease in haemoglobins associated with pregnancy improve outcomes for the baby, while others have identified adverse long term outcomes for the baby 13.

A U.S. and European study have demonstrated that even mild to moderate anaemia can be associated with adverse obstetrical outcomes, including preterm delivery, low birth weight and fetal death. However, most of the studies do not control for other factors that can cause low birth weight and prematurity (e.g., poor nutrition, smoking), making it unclear whether anaemia and iron deficiency are merely associated with these variables rather than having a direct influence on pregnancy outcomes.

Evidence level III

While an Indian study of the maternal and perinatal outcome in varying degrees of anaemia has found that: Mild anaemia fared best in maternal and perinatal outcome while severe anaemia was associated with increased low birth weight babies, induction rates, operative deliveries and prolonged labour 14.

The risk factors for preterm delivery and intrauterine growth retardation are quite similar, although relatively little is understood about the influence of maternal nutritional status on risk of preterm delivery. Several potential biological mechanisms were identified through which anaemia or iron deficiency could affect pregnancy outcome. Anaemia (by causing hypoxia) and iron deficiency (by increasing serum norepinephrine concentrations) can induce maternal and fetal stress, which stimulates the synthesis of corticotropin-releasing hormone (CRH). Elevated CRH concentrations are a major risk factor for preterm labour, pregnancy-induced hypertension and eclampsia, and premature rupture of the membranes. CRH also increases fetal cortisol production, and cortisol may inhibit longitudinal growth of the fetus. An alternative mechanism could be that iron deficiency increases oxidative damage to erythrocytes and the fetoplacental unit. Iron deficiency may also increase the risk of maternal infections, which can stimulate the production of CRH and are a major risk factor for preterm delivery 15.

Although others believed that plasma volume expansion in normal pregnancy causes a drop in maternal hemoglobin to concentrations commonly regarded as indicating anaemia; in fact, concentrations of 95-115 g/L with a normal mean corpuscular volume (84-99 fL) should be regarded as optimal for fetal growth and well-being and are associated with the lowest risk of preterm labour. Routine hematinic administration to women with values in these ranges is probably unnecessary 16.

Evidence Level III

A Regarding treatments for iron deficiency anaemia in pregnancy it has been found that there is inconclusive evidence on the effects of treating iron deficiency anaemia in pregnancy due to the shortage

of good quality trials 17,18.

In spite of that, it is widely accepted and is a common practice to treat with iron-replacement therapy in pregnancy and is recommended when iron deficiency anaemia is detected. But whether to treat pregnant women with mild anaemia remains controversial.

5.3.b Which treatment is recommended?

Management involves treatment of the underlying cause and oral iron-replacement therapy (e.g. with ferrous sulphate 200 mg three times a day), taken an hour before food or on an empty stomach, if oral iron is not well tolerated consider: taking with or immediately after food but absorption is reduced in such cases by about 40%, and reducing the daily dose once or twice a day - one tablet taken consistently is better than total rejection of a higher dose because of unacceptable adverse effects 3,19.

Adverse effects of oral iron are a common cause of non-compliance. They include epigastric discomfort, nausea, diarrhoea, constipation.

Although vitamin C (e.g. in citrus fruits and fruit juices) has been shown to increase oral iron absorption, high-dose vitamin C supplements should not be given with iron as the combination frequently causes epigastric pain 3.

Failure to respond to treatment is usually due to poor compliance. It can also be due to continuing excessive blood loss, associated inflammatory disease, malabsorption, a combined deficiency state, or another cause of hypochromic anaemia such as sideroblastic anaemia or thalassaemia trait.

Intramuscular or intravenous iron-replacement therapy might be considered if the person is completely unable to tolerate oral iron, or if losses exceed the amount that can be absorbed orally. However, this therapy should rarely be used outside a specialist setting. The rise in Hb is no faster than with effective oral therapy. Injections are painful, and there is a risk of anaphylaxis.

Oral iron is often the choice of route of administration for mild anaemia, with intramuscular and intravenous routes used in cases of extreme anaemia where side effects may need to be balanced against the possibility of cardiac failure due to severe anaemia.

Evidence level Ib

When comparing two intramuscular preparations women receiving intramuscular iron sorbitol complex had a lower rate of skin discoloration at injection sites, and headaches, when compared with intramuscular iron dextran 13.

A Intramuscular administration of 3 doses of 250 mg Fe at monthly intervals appears to have good compliance and efficacy and may be used in women who cannot tolerate oral administration of iron. However, intramuscular administration of iron is appropriate only in hospital settings well equipped to treat anaphylactic crises.

When comparing intramuscular with intravenous routes, the intramuscular routes produced more frequent pain at the injection site, but the intravenous iron treatment was associated with higher risk of venous thrombosis compared with intramuscular iron 13.

Evidence level Ib

Blood transfusion should usually be avoided. Someone with profound anaemia who has severe symptoms (e.g. severe heart failure) may require transfusion. This should be done with extreme caution, under diuretic cover, owing to the risk of precipitating or worsening heart failure 1,2,3,9.

The risk of maternal heart failure is increased at haemoglobin levels less than 7 g/dl, and discussion with an Obstetric unit is strongly recommended if the level is this low 3,6.

In addition it runs the risk of possible parasitic or viral infection transfusions such as HIV and hepatitis, despite screening. There is also possibility of bovine spongiform encephalitis (BSE) an as yet unknown viral infection 13.

In some countries, iron supplementation is routinely given with folic acid during the second half of pregnancy 20.

A The addition of folate to iron is more effective than iron alone in the treatment of iron deficiency anaemia in pregnancy.

5.4 What follow-up is recommended?

Check the full blood count 2-4 weeks after starting iron (earlier if symptoms are severe) in order to assess response to treatment. Recheck the full blood count thereafter using clinical judgement 21.

Haemoglobin (Hb) should rise by about 0.1-0.2 g/dl per day (about 2 g/dl every 3 weeks).

Iron replacement should be continued for 3 months once the Hb has normalized, in order to replenish iron stores 3, 22.

5.5 What other advice should give the patient?

Oral iron frequently causes stool to become black and it reduces the absorption of tetracyclines, quinolones, bisphosphonates, and zinc. The absorption of oral iron is reduced by zinc, magnesium salts (e.g. in antacids), calcium (e.g. in milk and dairy products), tannins (e.g. in tea, coffee, and cocoa), and phytates (present in cereal grains, legumes, nuts, and seeds) 3.

6. How can prevent iron deficiency anaemia in pregnancy?

6.1 The role of iron supplement?

The daily absorption of iron outside pregnancy is 1 mg. The total requirement throughout pregnancy is estimated at 500-1400 mg 8. The requirement is very small in the first trimester, increasing throughout the second and third trimester. The increased demands of pregnancy can therefore result in iron deficiency anaemia; as pregnancy proceeds many women show haematological changes suggesting iron deficiency. Evidence from stable-isotope studies suggests that the percentage of non heme iron absorbed from food during normal pregnancy increases from 7% at 12 wk of gestation to 36% at 24 wk and 66% at 36 wk. These dramatic changes enable the healthy pregnant woman to cope with the extra demands of pregnancy without becoming anaemic, but only if there is adequate iron in her diet. If the woman's diet is deficient in iron, as is the case in many developing countries, fetal requirements can be met only by additional contributions of iron from maternal stores. This demand by the developing fetus may cause the mother to develop iron deficiency anaemia if she had inadequate iron stores at the beginning of pregnancy 23.

Evidence Level Ib

C In an overview it has been stated that there is currently little evidence from published clinical research to suggest that routine iron supplementation during pregnancy is beneficial in improving clinical outcomes for the mother, fetus or newborn. The evidence is insufficient to recommend for or against routine iron supplementation during pregnancy.

Prophylactic iron supplementation for all pregnant women is not recommended in the UK. Likewise it is not recommended in Australia, Canada, and New Zealand; it is however recommended in France and the USA 20.

That is true. For women in developed countries who are generally clinically healthy and have access to adequate nutrition, the benefits of iron supplementation are unclear, and there may be risks. Thus, a better "conservative" approach may be that such women do not require routine iron supplementation during pregnancy 24.

But in developing countries anaemia in pregnancy is high and this is attributed to poor nutrition and the high incidence of disease and it can be associated with increasing problems including postpartum haemorrhage which is a major contributor to maternal mortality in many developing countries 24.

Administration of a daily iron supplement from conception to 28 wk of gestation to initially iron-replete, non anaemic pregnant women would reduce the prevalence of anaemia at 28 wk and increase birth weight, a significantly higher mean birth weight, a significantly lower incidence of low-birth-weight infants, and a significantly lower incidence of preterm low-birth-weight infants 25.

Evidence level Ib

A Prenatal prophylactic iron supplementation deserves further examination as a measure to improve birth weight and potentially reduce health care costs 25.

A The risk of being anaemic during the second trimester would be reduced for women receiving iron prenatally 13.

6.2 How much iron is needed:

Iron is mandatory for normal fetal development, including the brain, and iron deficiency may have deleterious effects for intelligence and behavioral development. But Iron has a negative influence on absorption of other divalent metals and increases oxidative stress in pregnancy, for which reason minimum effective iron dose should be advised. From a physiologic point of view, individual iron prophylaxis according to serum ferritin concentration should be preferred to general prophylaxis. Suggested guidelines are (1) ferritin >70 µg/l: no iron supplements; (2) ferritin 30-70 µg/l: 40 mg ferrous iron daily; and (3) ferritin <30 µg/l: 80-100 mg ferrous iron daily. There are no documented side effects of iron supplements below 100 mg/day. Iron supplements should be taken at bedtime or between meals to ensure optimum absorption 26, 27.

Evidence level Ib

But in case of non availability of serum ferritin a supplement of 40 mg ferrous iron/day from 18 weeks of gestation appears adequate to prevent iron deficiency in 90% of the women and iron deficiency anaemia in at least 95% of the women during pregnancy and postpartum. The outcome is almost the same in women using this dose or higher doses of iron. While the frequency of gastrointestinal symptoms was not significantly different in using lower doses as 20 mg but the 20 mg had significantly lower median serum ferritin in the postpartum period than the higher dose. For that it seems that the dose of 40 mg is just the right prophylactic dose 28.

In developing countries, supplementation should be initiated as soon as possible after conception because of the high prevalence of iron deficiency at the onset of pregnancy 29.

6.3 What other factors looked for in the prevention?

6.3.a What is the role of hookworm infection in iron deficiency anaemia?

In the assessment of the prevalence and severity of anaemia and iron deficiency and their association with helminths, malaria and vitamin A deficiency in developing countries, it has been shown that around two thirds of the women with iron deficiency anaemia had hookworm infestation and hookworm infestation intensity was the strongest predictor of iron status, especially of depleted iron stores. Low serum retinol was most strongly associated with mild anaemia, whereas *P. vivax* malaria and hookworm infestation intensity were stronger predictors of moderate to severe anaemia. For that reason low serum ferritin was increased with increasing intensity of hookworm infestation 30.

Evidence level III

B These findings reinforce the need for programs to consider reducing the prevalence of hookworm.

6.3.b What is the role of diets in the prevention?

In developing countries the diets of pregnant women consist primarily of plant-based foods. Animal foods are scarce except for milk. Most of the items consumed are low in iron. Iron deficiency is partly induced by plant-based diets containing low levels of poorly bio-available iron 31.

Evidence level III

An assessment of dietary intake is required to aid in the development of relevant dietary guidelines for those populations.

6.3.c What is the role of iron supplementation during adolescence?

Iron deficiency anaemia is prevalent among adolescent girls because the growth spurt and onset of menstruation increase iron requirements. Women who conceive during or shortly after adolescence are likely to enter pregnancy with low or absent iron stores or IDA.

Iron supplementation during adolescence is one of the new strategies advocated to improve iron balance in pregnancy.

Although supplementation will correct anaemia and increase iron stores in girls, the positive effect on iron sta-

tus will be temporary if their diets do not contain adequate bio-available iron. But iron status in early pregnancy may be improved if the period of supplementation continues up to the time of conception.

Supplementation before pregnancy should be viewed as an additional strategy to supplementation during the second and third trimesters 32.

A considerable amount of information remains to be learned about the benefits of maternal iron supplementation on the health and iron status of the mother and her child during pregnancy and postpartum. Current knowledge indicates that iron deficiency anaemia in pregnancy is a risk factor for preterm delivery and subsequent low birth weight, and possibly for inferior neonatal health. But data are inadequate to determine the extent to which maternal anaemia might contribute to maternal mortality and even for women who enter pregnancy with reasonable iron stores, iron supplements improve iron status during pregnancy and for a considerable length of time postpartum, thus providing some protection against iron deficiency in the subsequent pregnancy. Mounting evidence indicates that maternal iron deficiency in pregnancy reduces fetal iron stores, perhaps well into the first year of life. This deserves further exploration because of the tendency of infants to develop iron deficiency anaemia and because of the documented adverse consequences of this condition on infant development 33.

G In developing countries, the weight of evidence still supports the advisability of routine iron supplementation during pregnancy and is regarded as good practice.

Appendix:

The evidence used in this guideline was graded using the scheme below and the recommendations formulated in a similar fashion with a standardised grading scheme.

Classification of evidence levels

- 1a** Evidence obtained from meta-analysis of randomised controlled trials.
- 1b** Evidence obtained from at least one randomised controlled trial.

- Ia** Evidence obtained from at least one well-designed controlled study without randomisation.
- Ib** Evidence obtained from at least one other type of well-designed quasi-experimental study.
- III** Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.
- IV** Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities.

Grades of recommendations

- A** Requires at least one randomised controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation. (Evidence levels Ia, Ib)
- B** Requires the availability of well controlled clinical studies but no randomised clinical trials on the topic of recommendations. (Evidence levels IIa, IIb, III)
- C** Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates an absence of directly applicable clinical studies of good quality. (Evidence level IV)

Good Practice Point

- G** Recommended best practice based on the clinical experience of the guideline development group.

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