

Clinical and Para Clinical Information Needs of Infertility Electronic Health Records in Iran: A Delphi Study

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ABSTRACT

Background: infertility is referred to the person's inability to conceive pregnancy after one year of intercourse without using protection. This study paves the ground for creating a complete, united, and coherent source of patients' medical information. **Materials and Methods:** this is an applied research of descriptive-cross sectional type which has been carried out through qualitative – quantitative methods. The sample of the present study was 50 specialists in the field of infertility which has been chosen based on purposive sampling method. Designing the questionnaire was done based on library studies and Gathering experts' views was done based on Delphi technique. **Results:** 261 items from clinical and Para clinical information of infertile patients' electronic health records were subjected to an opinion poll by experts. During this process 223 items were accepted and 38 items have been rejected after two sessions of surveys by infertility experts. Para clinical information section consisted of 57 items that all of them have been accepted by the experts. Also, clinical information section consisted of 242 items from which 204 items were accepted and 38 items were rejected by the experts. **Conclusion:** existence of a structured electronic record system of infertile patients' information leads to the integration of patients' information, improvement of health care services and a decrease in treatment costs: all working to increase information safety. Furthermore, only essential and relevant information would be provided for the specialists and it will facilitate and direct the future infertility related studies due to the coherence, unity and relevance of the information.

Keywords: information requirement, infertility, electronic health record, Iran.

1. INTRODUCTION

Infertility is referred to the person's inability to conceive pregnancy after one year of intercourse without using protection (1). World health organization named infertility as one of the severe problems of public health in all over the world (2). Availability of proper information can play a great role in the process of infertility treatment (3). Information assessment facilitates the selection process, as information needs are the engine of commencing the process of planning and decision making (4).

Paper based records, due to their inherent limitations, are not able to meet the growing needs of information in the field of health care (5). So, implementation of new technologies in order to have judicious utilization of information in this field has become a priority these days and developing electronic health records can be a solution to this problem (6). One should under-

stand that obtained information from patients contact with infertility centers are of high importance. Whether the information are collected manually or electronically; if they are thorough, relevant and qualified, it can guarantee integrity of information, peoples' trust in treatments outcomes, and researches' proper results (7). Accordingly, paying due attention to the information needs of users and operators while designing information systems, developing a unified platform for electronic health systems (e.g. electronic health records) before implementing and using them, analysis of users' understating of the system and their satisfaction rate can be a grantee for implementing a system and also would be essential (8).

2. AIM

This issue is of much importance because the information should be constantly tracked and recorded especially in infertile cases. Accordingly,

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the present study was carried out with the aim of designing information requirements of electronic health records of infertility centers; in order to pave the ground for creating a unified, coherent, integrated and complete source of patients' medical information which can obviate issues related to treatment, prescription, laboratory test results and medical health information.

3. MATERIALS AND METHODS

This is a descriptive-cross sectional type of inquiry which has been carried out through qualitative – quantitative methods. The sample to this study was a group of 50 experts working in the field of infertility including infertility fellowships, gynecologists, urologist, embryology PhD holders, and genetics PhD holders. They have been chosen based on purposive sampling method. Furthermore, they needed to have over 5 years experience of working in infertility centers.

The study was done in two phases of library research, for designing the questionnaire, and performing Delphi technique in order to collect experts' opinion. In the first phase which has been done with the aim of identification of infertility centers' information requirements, the researcher investigated forms, paper records related to infertility, texts and articles with regard to electronic health records, infertility information requirements mentioned in information databases, and collected information elements using content analysis approach. The extracted information elements from the first phase devised into a 5 point Likert scale questionnaire. For the sake of measuring face validity of the questionnaire, 2 experts in the field of health information management analyzed it.

The researchers had the questions analyzed by 15 experts with regard to their necessity, simplicity, explicitness, and relatedness using Lauche technique. Afterwards, CVI5 and CVR6 indices were calculated. During the process of measuring content validity, all the information elements obtained the required scientific scores and none of them were eliminated from the questionnaire. Information gathering was done by means of Delphi technique, in-person presence of the researcher, and questionnaire completion. Information gathering method was interview and after analyzing the answers, researchers revised the questionnaire based on expert opinions. Then, data elements were discussed again. Questionnaire revision and gathering experts' opinion continued until an agreement was achieved.

Analyzing the data was done using spss 21 software package. Also, a number was assigned to each option in that "strongly disagree" was 1, "disagree" was 2, "neither agree nor disagree" was 3, "agree" was 4 and "strongly agree" was 5. The average score of each item was calculated and in each round of survey, items (information requirement items) which obtained an average score less than 3 were eliminated. Information requirement items which scores were in the range of 3 to less than 4 ($3 < \mu \leq 4$) returned to the expert opinion poll phase again until a final agreement reached and they were either rejected or accepted. Likewise, information requirement items which scored 4 and more than 4 ($4 < \mu \leq 5$) in the experts' opinion poll were confirmed by the researchers.

The participation in the study was voluntarily and in-

formed. The study was approved by the IR.KAUMS.REC research committee (code 1394.86).

Couples test results data		No	%	Average	status
1	FBS	43	86%	4.26	Confirmed
2	LH, FSH	43	86%	4.26	Confirmed
3	CBC	43	86%	4.26	Confirmed
4	blood group	43	86%	4.56	Confirmed
5	RH	43	86%	4.35	Confirmed
6	HIV	43	86%	4.28	Confirmed
7	VDRL	43	86%	4.3	Confirmed
8	HBS AG	43	86%	4.3	Confirmed
9	HCV AB	43	86%	4.3	Confirmed
10	T3, T4, TSH	43	86%	4.19	Confirmed
11	progesterone	43	86%	4.3	Confirmed
12	estrogen	43	86%	4.33	Confirmed
13	prolactine	43	86%	4.35	Confirmed
14	testosterone	43	86%	4.49	Confirmed
15	Test of tubal patency	43	86%	4.49	Confirmed
16	Sperm-function tests	43	86%	4.47	Confirmed
17	Antiphospholipid antibody igM, IgG	43	86%	4.21	Confirmed
18	Anticardiolipin antibody igM, IgG	43	86%	4	Confirmed
19	Antinuclear antibody (ANA)	43	86%	4.02	Confirmed
20	Post coital test (PCT)	43	86%	4.16	Confirmed
21	Anti-mullerian hormone test (AMH)	43	86%	4.19	Confirmed
22	BBT Table	43	86%	4.12	Confirmed
23	PGD TEST	43	86%	4.16	Confirmed
24	AZF TEST	43	86%	4.16	Confirmed
25	DHEAS TEST	43	86%	4.14	Confirmed
26	CAP TEST	43	86%	4.44	Confirmed
27	Semen Analysis and cultivation Test	43	86%	4.58	Confirmed
28	Semen Fructose test	43	86%	4.56	Confirmed
29	Karyotype	43	86%	4.56	Confirmed
30	Anti-sperm anti-body test	43	86%	4.56	Confirmed
31	Peroxidase	43	86%	4.6	Confirmed
32	Semen plasma test	43	86%	4.67	Confirmed
33	Spermgram test	43	86%	4.6	Confirmed
34	Testing for antibodies in the blood	43	86%	4.4	Confirmed
35	Ovarian related tests	43	86%	4.33	Confirmed
36	fungal and microbial tests of genital systems'	43	86%	4.62	Confirmed
37	Chromosomal analysis	43	86%	4.3	Confirmed
38	Date and results of test	43	86%	4.23	Confirmed
Couples medical imaging results		No	%	Average	status
1	Hysterosalpingography (HSG)	43	86%	4.53	Confirmed
2	Hysteroscopy	43	86%	4.58	Confirmed
3	Hysterosonography	43	86%	4.51	Confirmed
4	Uterine sonography	43	86%	4.53	Confirmed
5	Doppler sonography: three and four dimensional	43	86%	4.35	Confirmed
6	Abdominal and vaginal ultra-sonography	43	86%	4.49	Confirmed
7	Testicular sonography	43	86%	4.53	Confirmed
8	Trans-rectal sonography (TRUS)	43	86%	4.47	Confirmed
9	Doppler Eco-graphy	43	86%	4.37	Confirmed
10	cystoscopy	43	86%	4.42	Confirmed
11	Laparoscopy	43	86%	4.47	Confirmed
12	Vasoeepididymostomy	43	86%	4.51	Confirmed
13	vasovasostomy	43	86%	4.51	Confirmed
14	varicocelectomy	43	86%	4.51	Confirmed
15	Endometrial biopsy	43	86%	4.56	Confirmed
16	Tactical biopsy	43	86%	4.56	Confirmed
17	Testicular sperm extraction (TESE)	43	86%	4.42	Confirmed
18	percutaneous epididymal sperm aspiration. (PESA)	43	86%	4.42	Confirmed
19	Electro Ejaculation	43	86%	4.4	Confirmed

Table 1. The Average Scores of Experts' Opinion on Infertile Couples Para Clinic Information in the Electronic Health Records- 2016

4. RESULTS

From 50 experts participated in the study, 43 of them (86%) agreed to cooperate in the study from which 8 participants (16.8%) were male and 35 participants (81.4) were female. Their age average was 44 years and their working experience among men was 17 years while it was 14 years among women. As far as their field of study was concerned, 6 experts (13.95%) were embryologist, 2 experts (4.65%) were genetics specialist, 34 experts (70.08%) were gynecologist, and 1 expert (2.32%) was urologist. Likewise, as far as their academic degree was concerned, 1 expert (2.32%) was specialist, 8 experts (18.6%) were PhD holders, 20 (46.52%) experts were surgeons sub-specialist in gynecology, and 14 (32.56%) experts got infertility fellowship (table 1, table 2).

Females' current diseases history					
	No	%	Average	status	
1	Current disease	43	86%	4	Confirmed
2	Treatments done for the current diseases	43	86%	4	Confirmed
Females' reproductive system history					
	No	%	Average	status	
1	Start date of menstrual cycle	43	86%	4.58	Confirmed
2	Age of first of menstrual cycle	43	86%	4.67	Confirmed
3	Day, month and year of last menstrual cycle	43	86%	4.6	Confirmed
4	days of bleeding cycle	43	86%	4.35	Confirmed
5	The shortest/longest time interval during bleeding	43	86%	4.35	Confirmed
6	Bleeding flow (dark or bright)	43	86%	4.3	Confirmed
7	Regular menstruation	43	86%	4.53	Confirmed
8	Irregular menstruation	43	86%	4.56	Confirmed
9	Painful menstruation (before bleeding)	43	86%	4.47	Confirmed
10	Painful menstruation (during bleeding)	43	86%	4.51	Confirmed
11	Rare menstruation	43	86%	4.49	Confirmed
12	Absence of menstruation	43	86%	4.53	Confirmed
13	Bleeding between menstrual cycles	43	86%	4.33	Confirmed
14	Breasts sensitivity	43	86%	4.23	Confirmed
15	Galactorrhea	43	86%	4.26	Confirmed
16	flaming	43	86%	4.23	Confirmed
17	Pelvic pain or cramp during menstruation	43	86%	4.12	Confirmed
18	Pelvic pain or cramp before menstruation	43	86%	4.12	Confirmed
19	Pelvic pain or cramp after menstruation	43	86%	4.07	Confirmed
20	Pelvic pain or cramp during urination	43	86%	4.33	Confirmed
21	Pelvic pain or cramp during fast activities	43	86%	4.3	Confirmed
22	List of medication used for Pelvic pain or cramp	43	86%	4.33	Confirmed
23	Latest genital system test results and date	43	86%	4.49	Confirmed
24	Latest pap smear result and date	43	86%	4.35	Confirmed
25	Latest mammography result and date	43	86%	4.26	Confirmed
Pregnancy history					
	No	%	Average	status	
1	First infertility	43	86%	4.47	Confirmed
2	Secondary infertility	43	86%	4.47	Confirmed
3	Year of delivery (if you had delivery)	43	86%	4.07	Confirmed
4	Complete weeks of pregnancy	43	86%	4.12	Confirmed
5	Type of delivery	43	86%	4.09	Confirmed
6	Baby (alive-dead)	43	86%	4.07	Confirmed
7	Baby's health condition	43	86%	4.16	Confirmed
8	Baby's weight after birth	43	86%	4	Confirmed
9	Baby and mother's problems	43	86%	4.16	Confirmed
10	Abortion	43	86%	4.42	Confirmed
11	Miscarriage	43	86%	4.42	Confirmed
12	Molar pregnancy	43	86%	4.23	Confirmed
13	Tubal pregnancy	43	86%	4.3	Confirmed
14	Recording performed infertility treatments	43	86%	4.67	Confirmed
Females' sexual and infertility history					
	No	%	Average	status	
1	Duration of marriage in Day, month and year	43	86%	4.07	Confirmed

2	Duration of infertility in month and year	43	86%	4.67	Confirmed
3	Duration of performing unprotected intercourse	43	86%	4.58	Confirmed
4	Different protection methods: diaphragm	43	86%	4.02	Confirmed
5	Different protection methods: pills	43	86%	4.6	Confirmed
6	Different protection methods: implantable capsules	43	86%	4.42	Confirmed
7	Different protection methods: contraceptive patch	43	86%	4.3	Confirmed
8	Different protection methods: Injections	43	86%	4.3	Confirmed
9	Different protection methods: vaginal contraceptive rings	43	86%	4.23	Confirmed
10	Different protection methods: condoms (male-female)	43	86%	4.65	Confirmed
11	Different protection methods: IUD	43	86%	4.58	Confirmed
12	Different protection methods: tubectomy	43	86%	4.72	Confirmed
13	Different protection methods: natural procedure	43	86%	4.67	Confirmed
14	Different protection methods: hormonal procedures	43	86%	4.51	Confirmed
15	Different protection methods: sponges	43	86%	4.49	Confirmed
16	Different protection methods: spermicidal	43	86%	4.42	Confirmed
17	Times of sexual intercourse in week and month	43	86%	4.35	Confirmed
18	Painful intercourse	43	86%	4.05	Confirmed
19	Bleeding or blood stains during intercourse	43	86%	4.07	Confirmed
20	Using lubricants during intercourse	43	86%	4.16	Confirmed
21	Vaginal discharge	43	86%	4.47	Confirmed
22	Breast discharge	43	86%	4.44	Confirmed
23	External sexual organ: normal	43	86%	4.37	Confirmed
24	External sexual organ: adventitious abnormality/ congenital abnormality	43	86%	4.33	Confirmed
25	Internal sexual organ: normal	43	86%	4.23	Confirmed
26	Internal sexual organ: adventitious abnormality/ congenital abnormality	43	86%	4.23	Confirmed
27	Virginity : intact – deflowered	43	86%	4.02	Confirmed
28	Share every sexual problem with specialists	43	86%	4.21	Confirmed
Male problems and diseases					
	No	%	Average	status	
1	Prostate	43	86%	4.6	Confirmed
2	Testicle tumor	43	86%	4.53	Confirmed
3	Epididymitis	43	86%	4.51	Confirmed
4	orchiditis	43	86%	4.51	Confirmed
5	Testicle injuries	43	86%	4.56	Confirmed
6	Immature testicles	43	86%	4.53	Confirmed
7	Injuries and inflammation of urinary tracts	43	86%	4.4	Confirmed
8	inguinal hernia	43	86%	4.56	Confirmed
9	hypospadias	43	86%	4.33	Confirmed
10	Sympathectomy	43	86%	4.33	Confirmed
11	Hydrosoel	43	86%	4.37	Confirmed
12	Penis wounds	43	86%	4.44	Confirmed
13	Scrotal swelling	43	86%	4.51	Confirmed
14	Thick or thin epididymis	43	86%	4.3	Confirmed
15	Spermatocele	43	86%	4.42	Confirmed
16	Varicocele	43	86%	4.6	Confirmed
17	Gynecomastia	43	86%	4.42	Confirmed
18	High fever in last six month	43	86%	4.28	Confirmed
19	Swollen-occipital lymph node	43	86%	4.07	Confirmed
20	Infected wounds	43	86%	4.26	Confirmed
21	Congenital disorders	43	86%	4.16	Confirmed
22	Erection problems	43	86%	4.44	Confirmed
23	Ejaculation problems	43	86%	4.63	Confirmed
24	Penis discharge	43	86%	4.67	Confirmed
25	Semen analysis , date of analysis and its results	43	86%	4.67	Confirmed
26	Microscopic findings of semen analysis	43	86%	4.63	Confirmed
27	other performed tests, date and results	43	86%	4.16	Confirmed
Males' case history					
	No	%	Average	Status	

1	Recording histories of treatments / surgeries related to infertility	43	86%	4.65	Confirmed
2	Date of treatments / surgeries related to infertility	43	86%	4.28	Confirmed
3	Information and analysis of treatments / surgeries related to infertility	43	86%	4.32	Confirmed
4	Vasectomy	43	86%	4.51	Confirmed
5	Injuries/surgeries of Vaginal systems	43	86%	4.55	Confirmed
	Social history of couples	No	%	Average	status
1	Regular exercising	43	86%	4.06	Confirmed
2	Caffeine drinks (how many cups a day?)	43	86%	4	Confirmed
3	Alcohol drinks	43	86%	4	Confirmed
4	Smoking and its duration	43	86%	4.04	Confirmed
5	Drug abuse, name and duration	43	86%	4.07	Confirmed
	Previous Medical and surgical history of couples	No	%	Average	status
1	List of drugs you are allergic to	43	86%	4.03	Confirmed
2	Your reaction to the drugs you are allergic to	43	86%	4.06	Confirmed
3	List of drugs you are currently taking	43	86%	4.06	Confirmed
4	Reasons and duration of taking drugs	43	86%	4.04	Confirmed
5	Recording hospitalization cases	43	86%	4.26	Confirmed
6	Date of hospitalization and its reasons	43	86%	4.01	Confirmed
7	Recording performed surgeries	43	86%	4.34	Confirmed
8	Date, reason and type of performed surgeries	43	86%	4.05	Confirmed
9	Lists of drugs taken during and after performed surgeries	43	86%	4.11	Confirmed
10	Dose and duration of taken drugs	43	86%	4.13	Confirmed
11	Recording blood transfusion	43	86%	4.12	Confirmed
12	Exposure to chemical, toxic and radioactive material	43	86%	4.19	Confirmed
13	Severe accidents	43	86%	4.02	Confirmed
	History of couples' diseases	No	%	Average	status
1	measles	43	86%	4.44	Confirmed
2	Rubella	43	86%	4.32	Confirmed
3	Chickenpox	43	86%	4.32	Confirmed
4	Mumps	43	86%	4.34	Confirmed
5	Cardio vascular diseases	43	86%	4.20	Confirmed
6	Severe respiratory diseases: lungs, bronchitis, asthma	43	86%	4.04	Confirmed
7	Diabetes	43	86%	4.02	Confirmed
8	High or low blood pressure	43	86%	4.09	Confirmed
9	Thyroid	43	86%	4.27	Confirmed
10	Obesity	43	86%	4.04	Confirmed
11	Repetitive urinary tracts infections	43	86%	4.04	Confirmed
12	Venereal disease : Pelvic inflammatory disease (PID)	43	86%	4.42	Confirmed
13	Abdominal and intestinal ulcers	43	86%	4.16	Confirmed
14	Kidney diseases	43	86%	4.02	Confirmed
15	Blood related diseases and disorders	43	86%	4.27	Confirmed
16	Cancer	43	86%	4.23	Confirmed
17	Mental disorders like depression, anxiety, etc	43	86%	4.02	Confirmed
18	Repetitive abortions	43	86%	4.34	Confirmed
19	Fetal syndromes like mental Retardation or genetic problems	43	86%	4.3	Confirmed
20	Hypertrichosis	43	86%	4.51	Confirmed
21	Acne	43	86%	4.02	Confirmed
22	Rheumatic fever	43	86%	4.18	Confirmed
23	Condylomata acuminata	43	86%	4.34	Confirmed
24	Herpes genital	43	86%	4.34	Confirmed
25	Gonorrhoea	43	86%	4.16	Confirmed
26	Chlamydia	43	86%	4.16	Confirmed
27	Syphilis	43	86%	4.13	Confirmed
28	Endometriosis	43	86%	4.13	Confirmed
29	AIDS	43	86%	4.28	Confirmed
30	Autoimmune diseases and disorders	43	86%	4.04	Confirmed
31	Vaginal infections	43	86%	4.30	Confirmed
32	Rare and genetic diseases	43	86%	4.42	Confirmed

33	Other diseases not mentioned	43	86%	4.25	Confirmed
	Couples' parental history	No	%	Average	status
1	Breast/ Ovarian / Intestine / Uterus / Cervix / Endometriosis cancer	43	86%	4.33	Confirmed
2	Diabetes	43	86%	4.04	Confirmed
3	Cardio vascular diseases	43	86%	4	Confirmed
4	High and low blood pressure	43	86%	4.04	Confirmed
5	Auto immune disorders	43	86%	4.23	Confirmed
6	Blood disorders like Thalassemias and Hemophilia	43	86%	4.11	Confirmed
7	Spine Bifida	43	86%	4.04	Confirmed
8	Anencephaly	43	86%	4.06	Confirmed
9	Muscular dystrophy	43	86%	4.06	Confirmed
10	Cystic-pharoses	43	86%	4.23	Confirmed
11	Huntington	43	86%	4.23	Confirmed
12	Infertility	43	86%	4.58	Confirmed
13	Repetitive abortion	43	86%	4.56	Confirmed
14	Premature ovarian failure and Irregular menstruation cycles	43	86%	4.42	Confirmed
15	Congenital deficits like Cleft lips	43	86%	4.16	Confirmed
16	Chromosome disorders	43	86%	4.30	Confirmed
17	Autism	43	86%	4	Confirmed
18	Every important family history	43	86%	4.23	Confirmed
19	A list of people with mentioned problems in the family	43	86%	4.18	Confirmed
	Couples' consultation	No	%	Average	status
1	Infertility consultation	43	86%	4.51	Confirmed
2	Physiologic consultation	43	86%	4.42	Confirmed
3	Genetic consultation	43	86%	4.4	Confirmed
4	Urologic consultation	43	86%	4.3	Confirmed
	Couples' infertility diagnose	No	%	Average	status
1	Male factor	43	86%	4.60	Confirmed
2	Tubal factor	43	86%	4.58	Confirmed
3	Endometriosis	43	86%	4.58	Confirmed
4	Unexplained	43	86%	4.49	Confirmed
5	Sexual dysfunction	43	86%	4.35	Confirmed
6	Amenorrhea	43	86%	4.23	Confirmed
7	Iatrogenic Causes	43	86%	4.21	Confirmed
8	Cervical Factor	43	86%	4.47	Confirmed
9	Congenital abnormalities	43	86%	4.21	Confirmed
10	PCO (polycystic ovarian)	43	86%	4.51	Confirmed
11	Uterus factor	43	86%	4.51	Confirmed
12	Age factor	43	86%	4.51	Confirmed
	Couples' treatments	No	%	Average	status
1	ICSI	43	86%	4.51	Confirmed
2	IVF	43	86%	4.63	Confirmed
3	IUI	43	86%	4.58	Confirmed
4	GIFT	43	86%	4.56	Confirmed
5	ZIFT	43	86%	4.42	Confirmed
6	Blastocyst Transfer	43	86%	4.19	Confirmed
7	Assisted Hatching	43	86%	4.19	Confirmed
8	Egg Donation	43	86%	4.47	Confirmed
9	Sperm Donation	43	86%	4.47	Confirmed
10	THE FROZEN EMBRYO REPLACEMENT CYCLE (FERC)	43	86%	4.4	Confirmed
11	Ovulation induction	43	86%	4.49	Confirmed
12	Surrogacy	43	86%	4.3	Confirmed
13	Drug therapy	43	86%	4.51	Confirmed
14	Surgery	43	86%	4.30	Confirmed
15	Date and results of performed treatments	43	86%	4.14	Confirmed
16	Procedure explanation	43	86%	4.14	Confirmed
17	List of medications	43	86%	4.14	Confirmed

Table 2. The Average Scores of Experts' Opinion on Infertile Couples' Clinic Information in the Electronic Health Records- 2016

5. DISCUSSION

The present study included 261 clinic and Para clinic information items from infertile patients' electronic health re-

cords that has been subjected to a poll for infertility experts' opinion. The opinion poll results showed that 223 information items were accepted and 38 items (after two phases of polling) were rejected based on infertility experts' opinion.

Para clinic information

In this section, experts voted for 57 information items and all of them were acceptable to them. In order to achieve pregnancy, the couple should be sound and healthy; therefore, the results of Para clinic interventions determine the couples' fertility levels and the quality of follow up treatment procedures. Accordingly, it has been considered as the most important way of diagnosing the causes of infertility.

Kahouei et al. (2013), in accordance with the present study, reported that presence of different types of Para clinic information in electronic health records is of crucial importance and these information can change the process of clinical interventions. It also can help to improve the quality of medical care delivered to the patients (9).

In Nikbakt et al.'s study, Hysteroscopy has been assessed of higher importance over Hysterosalpingography during checking uterine cavity. Even when Hysterosalpingography is normal, Hysteroscopy can improve diagnosis up to 40%. Due to the ease of performance, it is suggested that Hysteroscopy should be a part of the routine checking process of infertile couples (10). This is also in accordance with the results of the current study.

Clinical information

In this section the total number of 242 information items was subjected to the experts' opinion poll. As a result, 204 information items were accepted and 38 items were rejected. One of the most crucial information items in the process of infertile patients' treatment is drugs' side effects and allergies. This area has also been chosen as an important information item by infertility experts. Different studies emphasized on the importance of this issue as well.

Bonde's study in line with the present study indicates that patients who are dealing with chemical materials are suffering from infertility more than other people (11). Smoking also can be related to the male infertility. Studies indicated that intercourse rate in non smoker people is twice as many as smokers and smoking can affect sperms quality with their form and motility (12).

Varicocele, vaginal infection and testicular damage has been mentioned as the most common reasons of male infertility (13-14), a fact which is in accordance with the results of the present study. Based on safdari et al., length of infertility and marriage duration are two important infertility information items. Besides, recording these items in patients' electronic health records has been assessed as of crucial importance (15).

One of the necessary factors in infertility electronic records is menstrual cycle with its regularity, painfulness, time length, bleeding between cycles and breast sensitivity. It is proven that recording this information can be highly effective in the treatment process. Also these information items were considered important in Australian, American and British electronic record systems (16-17). Abortion and miss pregnancies, ectopic pregnancy, molar pregnancy, and tubal pregnancy were also among the important information items according to Iranian infertility experts. These items are also recorded in American and Australian electronic record sys-

tems (16-17).

In present study, family history was mentioned as an important information category. We believe that most infertility problems and disorders can be traced back to the patients' family history and discovering these patterns can contribute to the treatment process of infertile couples. Noticing and recording information like repeated abortions, infertility, genetic diseases of couples, genetic diseases of other children, genetic disorders, person's medical history in patients' electronic health records is highly necessary; whilst in ahmadi et al.'s study, family history and congenital disorders achieved the least mean score (18).

In their study, Dayan et al. stated that electronic health records through decreasing expenses and improving incomes can be even financially beneficial to the patients and medical organizations. In conclusion, "cost-savings programs exist, but computerization, which allows them to be implemented in a highly effective manner, is an excellent platform for economic efficiency" (19).

6. CONCLUSION

Nowadays, in current society, infertility is among the most serious issues of life and has a great effect on families and society mental health. Existence of a developed and systematic electronic health record system for infertile patients can cause integrity of patients' information, improvement of medical care, reduction of medical costs, increasing information safety, delivery of only crucial and related information to the specialists, and also facilitates future infertility researches due to collection of coherent, integrated and related information. To reach the above mentioned aims, the present study shed some lights on information items of infertility centers' electronic health records based on infertility experts opinions in two sections clinical and Para clinical.

- Conflict of interest: We have no conflicts of interest to disclose.
- Author contribution: Mehrdad Farzandipour and Diana Shirzadi conceived of the presented idea. Diana Shirzadi developed the theory and performed the computations. Hamid Reza Gilasi and Fateme Rangraz Jeddi verified the analytical methods. Mehrdad Farzandipour encouraged Diana Shirzadi to investigate the subject and supervised the findings of this work. All authors discussed the results and contributed to the final manuscript.

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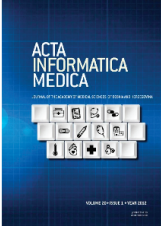
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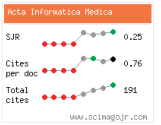
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