Original Article

Survey of Patients Receiving Treatment at a Fertility Treatment Clinic Regarding Anxiety Toward Treatment

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ABSTRACT

Introduction: It is considered important understanding of the fertility treatment recipients to support them. Bearing it in mind, we surveyed patients on their initial visit to a clinic specializing in fertility treatment to clarify how medical personnel can best support these patients through understanding stressors and physical and mental burdens.

Methods: Participants comprised 150 (targeting) patients being examined for the first time at Shinbashi Yume Clinic between March and June 2015. Surveys were conducted using an anonymous self-completed questionnaire. Survey including patients' age, hope for pregnancy, anxiety toward fertility treatment, etc. were conducted.

Results: Responses were received from 121 women (response rate, 80.6%). In statistical analyses, values of $p<0.05$ from χ^2 tests were taken as statistically significant.

The most common factor elicited for distress or impairment was "age" in the ≥40-year-old group ($p<0.05$). Responses of "economic burden" were the most common in patients who "did not want to become pregnant soon after marriage" ($p<0.05$). In this study, >70% of women surveyed were ≥35 years old, and >60% were employed. This is predicted to be related to the declining working population as society ages and fewer children are born. In actual clinical practice, many women patients want to balance work and family and have children after working for a certain period or advancing their career, by which point pregnancy has become more difficult.

Conclusions: In this research, we have primarily analyzed impairments and distress among fertility treatment patients. From the research results, it is also suggested the necessity of investigation of the best way to provide support by medical staff including prenatal fertility treatment and sex education.

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KEYWORDS: fertility treatment, in vitro fertilization, questionnaire survey, anxiety, age

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Introduction

Assisted reproductive technology (ART) has made dramatic progress and gives hope to many couples troubled by infertility. Advanced technologies such as in vitro fertilization and embryo transfer (IVF-ET), intracytoplasmic sperm injection (ICSI), and embryo cryopreservation have become universal, and today, 10,000 babies conceived through in vitro fertilization are born each year.[1] According to a discussion based on previous research about the physical, psychological, and social problems of couples receiving fertility treatment and ways to support them,[2] couples receiving fertility treatment are under considerable stress regarding the treatment itself or the side effects of hormone therapy, while the high cost of fertility treatment threatens their daily lives. Reasons for feeling stress from fertility treatment include the question of whether the fertility treatment will be successful and the time required for fertility treatment.[3] Medical personnel involved in tests related to infertility and the treatment process play a key role in patients continuing fertility treatment. In "Nursing guidelines for the support of infertility patients—Infertility tests and treatment process," understanding of the treatment recipient, forming a relationship of trust, support for self-determination, and assistance in self-care are considered important.[4] The present study used a questionnaire survey to clarify the attitudes of patients on their initial visit to a fertility treatment clinic, with the aim of understanding of the stress and physical and mental burdens of women receiving fertility treatment.

Materials and Methods

Subjects and survey methods and content

Subjects were patients visiting Shinbashi Yume Clinic for the first time between March and June 2015. Questionnaire forms (Table 1) were distributed to 150 patients, with responses obtained from 121 (response rate 80.6%). Survey items included patient age, number of children, occupation, hopes for pregnancy, period of infertility, and anxiety toward fertility treatment. Multiple responses were allowed for questions on anxiety, factors in distress and impairment related to infertility, and the persons patients confided in. Frequencies of different responses to these questions were compared by patient age, desire for pregnancy soon after marriage, and whether fertility treatment had been received in the past. Statistical analysis was performed using StatFlex version 6 software (Artech Co., Japan), and differences of $p<0.05$ with the χ^2 test were taken as statistically significant.

Prior to conducting the survey, individual patients were given written and oral explanations of the purpose of the survey, the handling of data, and the fact that data would not be used for purposes other than the survey, and written consent was obtained. Questionnaire forms were distributed and collected with consideration of patient privacy.

Ethical Review was conducted by Center Hospital of the National Center for Global Health and Medicine (Ethical Review No. 989).

Results

1. Patient demographics (Table 2)

Subject age was ≤34 years in 29 women (24.0%), 35-39 years in 43 women (35.5%), 40-44 years in 43 women (35.5%), and 45-49 years in 5 women (4.1%), with no response from 1 woman (0.8%). With regard to the number of children, 103 women (85.1%) had no children and 17 had children (14.0%), again with no response from 1 woman (0.8%). Occupation was homemaker for 33 women (27.3%), full-time regular employee for 53 women (43.8%), non-regular employee for 23 women (19.0%), assistant to a self-employed person for 10 women (8.3%), and other for 1 woman (0.8%), with no response from 1 woman (0.8%). Daily working hours was 1-2 h for 14 women (11.6%), 3-6 h for 26 women (21.5%), 7-8 h for 50 women (41.3%), and ≥9 h for 17 women (14.0%), with no response from 14 women (11.6%). The husband's occupation was regular employee for 105 women (86.8%), non-regular employee for 1 woman (0.8%), and self-employed for 9 women (7.4%), with no response from 6 women (5.0%).

2. Desire for pregnancy and past fertility treatment (Table 3)

Sixty-six women (54.5%) desired pregnancy soon after marriage and 54 (44.6%) did not, with no response from 1 woman (0.8%). The time from first wanting to become pregnant until the start of fertility treatment was <1 year for 35 women (28.9%), 1 year for 29 women (24.0%), 2 years for 25 women (20.7%), 3 years for 16 women (13.2%), and ≥4 years for 14 women (11.6%), with no response from 2 women (1.7%). The number of past spontaneous abortions was 0 for 85 women (70.2%), 1 for 24 women (19.8%), 2 for 8 women (6.6%), and ≥3 for 3 women (2.5%), with no response from 1 woman (0.8%). Infertility was considered re-

Table 1 Fertility treatment questionnaire

Q1 Age
20-24 years / 25-29 years / 30-34 years / 35-39 years / 40-44 years / 45-49 years (6 choices)
Q2 Number of children
0 / 1 / 2 / Other (4 choices)
Q3 Patient's occupation
Homemaker / Regular employee / Non-regular employee / Assistant to self-employed person (4 choices)
Q4 Husband's occupation
Regular employee / Non-regular employee / Self-employed (3 choices)
Q5 Wife's working hours
1-2 h / 3-4 h / 5-6 h / 7-8 h / Other (5 choices)
Q6 Desire for pregnancy soon after marriage
Yes / No (2 choices)
Q7 Time from desire to become pregnant until start of fertility treatment
<1 year / 1 year / 2 years / 3 years / 4 years / 5 years / More (years) (7 choices)
Q8 Cause (s) of infertility
Free response
Q9 Current main tests
Free response
Q10 Number of past experiences of spontaneous abortion
0 / 1 / 2 / Other (times) (4 choices)
Q11 Experience of fertility treatment in past
Yes / No (2 choices)
Q12 If "Yes" on Q11, duration of fertility treatment
1-2 years / 3-4 years / 5-6 years (3 choices)
Q13 If "Yes" on Q11, treatment method
Ovulation induction / Artificial insemination / In vitro fertilization / Timing method / Other ( ) (5 choices)
Q14 If "Yes" on Q11, number of monthly examinations
1 / 2 / 3 / 4 / Other ( ) (5 choices)
Q15 Experience of anxiety in receiving fertility treatment
Have anxiety / No anxiety (2 choices)
Q16 If "Yes" on Q15, main type of anxiety
Anxiety about possibility of pregnancy / Anxiety about physical suffering / Anxiety about unborn child / Anxiety about relationship with husband / Other (multiple responses possible)
Q17 Main factors for distress and impairment in fertility treatment
Economic burden / Psychological anxiety / Age / Lack of understanding in society / Time to visit clinic / Physical suffering / Lack of cooperation from husband / Lack of information / Excess of information / Understanding of family / Lack of understanding in workplace / Other (multiple responses possible)
Q18 Person confided in about infertility
Friend, acquaintance / Family, natural mother / Husband / Nurse, midwife / Doctor / Other (multiple responses possible)
Q19 Other
Please write freely. (Free response)

lated to the woman for 30 respondents (24.8%), to the man for 27 respondents (22.3%), to both for 14 respondents (11.6%), and unclear for 18 respondents (14.9%), with no response from 32 women (26.4%). A history of past fertility treatment was seen in 106 women (87.6%), comprising the timing method only in 13 women (12.3%), timing plus intrauterine insemination (IUI) in 43 women (40.6%), and in vitro fertilization (IVF) or ICSI in 48 women (45.3%), with no response from 2 women (1.9%). Duration of past fertility treatment was <1 year for 1 woman (0.9%), 1-2 years for 89 women (84.0%), 3-4 years for 14 women (13.2%), and ≥5 years for 1 woman (0.9%), with no response from 1 woman (0.9%).

3. Anxiety and distress regarding fertility treatment

With regard to anxiety toward fertility treatment, 118 women (97.5%) reported feeling anxiety, whereas 2 women (1.7%) did not, with no response from 1 woman (0.8%). Reasons for anxiety (multiple responses) were aggregated for the 118 women who felt anxiety (Table 4). The reason was the possibility of pregnancy in 104 women (88.1%), the un-

Table 2 Patient characteristics ($n=121$)

Age of patient					
≤34 years	35-39 years	40-44 years	45-49 years	No response	
29 (24.0%)	43 (35.5%)	43 (35.5%)	5 (4.1%)	1 (0.8%)	
Number of children					
No	Yes	No response			
103 (85.1%)	17 (14.0%)	1 (0.8%)			
Wife's occupation					
Homemaker	Regular employee	Non-regular employee	Assistant to self-employed person	Other	No response
33 (27.3%)	53 (43.8%)	23 (19.0%)	10 (8.3%)	1 (0.8%)	1 (0.8%)
Daily working hours					
1-2 h	3-6 h	7-8 h	≥9 h	No response	
14 (11.6%)	26 (21.5%)	50 (41.3%)	17 (14.0%)	14 (11.6%)	
Husband's occupation					
Regular employee	Non-regular employee	Self-employed	No response		
105 (86.8%)	1 (0.8%)	9 (7.4%)	6 (5.0%)		

born child in 55 women (46.6%), physical suffering in 42 women (35.6%), relationship with husband in 17 women (14.4%), and other in 32 women (27.1%). The main distress and impairment factors in fertility treatment were age in 86 women (72.9%), economic burden in 83 women (70.3%), psychological anxiety in 75 women (63.6%), the time to visit the clinic in 55 women (46.6%), physical suffering in 33 women (28.0%), lack of understanding in the workplace in 34 women (28.8%), lack of understanding in society in 25 women (21.2%), lack or excess of information in 23 women (19.5%), lack of cooperation from husband in 6 women (5.1%), family understanding in 6 women (5.1%), and other in 0 women (0.0%). The persons whom women confided in regarding anxiety or distress was their husband for 96 women (81.4%), friend or acquaintance for 61 women (51.7%), family or natural mother for 37 women (31.4%), doctor for 18 women (15.3%), nurse for 15 women (12.7%), and other for 5 women (4.2%). Responses to these questions (multiple responses) were compared by patient age, desire for pregnancy soon after marriage, and history of fertility treatment (Table 5). In the study by Imanaka et al., an awareness survey on "physical burden" and "psychological burden" was conducted, but the patients' age, desire for pregnancy, and history of fertility treatment were not included. Therefore, it was determined crucial for this study to include these categories in the awareness survey, because they are considered to influence patients' distress and impairments. However, the previous study did not include these points. The response of "age" as a factor in distress or impairment was significantly greater among women ≥40 years old than among women ≤39 years old ($p<0.05$). The response of "economic burden" was significantly greater among women who did not desire pregnancy soon after marriage than among those who did desire pregnancy soon after marriage ($p<0.05$).

Discussion

More than 70% of participants in this study were ≥35 years old, and >60% were employed (with more than half working ≥7 h/day). This was predicted to be related to the decline in the working population as society rapidly ages and has fewer children. Matsuura et al. described a similar background in the difficulty of balancing fertility treatment and work as more women are employed.[3] For this reason, the Ministry of Health, Labour and Welfare has recommended that companies make efforts on their own to obtain social awareness of paid leave based on Item 4, Article 39 of the Labor Standards Act, so that women can balance fertility treatment and employment.[5] The Basic Act for Measures to Cope with Society with Declining

Table 3 Desire for pregnancy after marriage and past fertility treatment

Desire for pregnancy soon after marriage					
Yes	No	No response			
66/121 (54.5%)	54/121 (44.6%)	1/121 (0.8%)			
Time from desire to become pregnant to start of fertility treatment					
<1 year	1 year	2 years	3 years	≥4 years	No response
35/121 (28.9%)	29/121 (24.0%)	25/121 (20.7%)	16/121 (13.2%)	14/121 (11.6%)	2/121 (1.7%)
Number of past spontaneous abortions					
0	1	2	≥3	No response	
85/121 (70.2%)	24/121 (19.8%)	8/121 (6.6%)	3/121 (2.5%)	1/121 (0.8%)	
Cause of infertility					
Related to woman	Related to man	Both	Don't know	No response	
30/121 (24.8%)	27/121 (22.3%)	14/121 (11.6%)	18/121 (14.9%)	32/121 (26.4%)	
History of past fertility treatment					
Yes	No	No response			
106/121 (87.6%)	15/121 (12.4%)	0/121 (0.0%)			
Method of past treatment					
Timing method	IUI	IVF/ICSI	No response		
13/106 (12.3%)	43/106 (40.6%)	48/106 (45.3%)	2/106 (1.9%)		
Duration of past fertility treatment					
<1 year	1-2 years	3-4 years	≥5 years	No response	
1/106 (0.9%)	89/106 (84.0%)	14/106 (13.2%)	1/106 (0.9%)	1/106 (0.9%)	

Birthrate was also enacted in 2003.[6] However, the attributes and background of subjects in this study showed little change despite more than 10 years having passed since the Ministry of Health, Labour and Welfare executed its plans associated with childcare support.

Although this survey has limitations, nevertheless the results show that women currently continue treatment despite advancing age and that even so, there has been little increase in the number of births, with a total fertility rate of 1.33-1.43 for the period from 2001 to 2013.[7] The results of this survey also show that time to visit the hospital, understanding in the workplace, understanding in society, and many other factors contribute to distress and impairment and that an environment in which women can readily receive fertility treatment has not been sufficiently developed. Another factor is that the system is not functioning as intended, so that the birth rate has not increased.

The most common form of anxiety concerning fertility treatment found in this study was anxiety about the possibility of pregnancy, followed by the anxiety regarding the unborn child. Most patients in the study had visited other hospitals or clinics and experienced some fertility treatments. Half of the patients had a history of IVF/ICSI treatment. The "anxiety" is the distress or uneasiness of mind caused by the fear of danger or misfortune.[8] The anxious feelings of the patients receiving fertility treatment may be increased by fearful thoughts such as "the treatment may not succeed" or "my dwindling confidence in continuing the treatment."

The report by Katsumata et al. indicated that the pregnancy rate fell markedly with the age of the patient.[9] Menken et al. reported that older age was a disadvantage in pregnancy and that the ideal age for women to become pregnant is 22-26 years, with the pregnancy rate declining beyond 35 years old and declining significantly after 39 years old.[10] Although there are individual circumstances,

Table 4 Reasons for anxiety toward fertility treatment (multiple responses)

Anxiety about fertility treatment		
Yes	No	No response
118 (97.5%)	2 (1.7%)	1 (0.8%)

Content of anxiety				
Possibility of pregnancy	Unborn child	Poor physical condition	Relationship with husband	Other
104/118 (88.1%)	55/118 (46.6%)	42/118 (35.6%)	17/118 (14.4%)	32/118 (27.1%)

Major factors for distress/impairment in fertility treatment										
Age	Economic burden	Psychological anxiety	Time to visit clinic	Physical suffering	Lack of understanding in workplace	Lack of understanding in society	Insufficient/ excessive information	Lack of cooperation from husband	Understanding of family	Other
86/118 (72.9%)	83/118 (70.3%)	75/118 (63.6%)	55/118 (46.6%)	33/118 (28.0%)	34/118 (28.8%)	25/118 (21.2%)	23/118 (19.5%)	6/118 (5.1%)	6/118 (5.1%)	0/118 (0.0%)

Person to confide in about anxiety and distress					
Husband	Friend/ acquaintance	Family/ natural mother	Doctor	Nurse/ midwife	Other
96/118 (81.4%)	61/118 (51.7%)	37/118 (31.4%)	18/118 (15.3%)	15/118 (12.7%)	5/118 (4.2%)

it is difficult to become pregnant after 40 years old.[11] This study also showed that many women do not want to become pregnant soon after marriage regardless of age, perhaps indicating a lack of understanding on the part of patients. Creating a social environment that makes it easier for women to give birth and raise children at a young age is also considered essential. In fact, according to a survey entitled "Starting Families" presented at the 26th Annual Meeting of the European Society of Human Reproduction and Embryology, the level of understanding regarding pregnancy differs greatly by country, with Japan among the countries with a low general level of understanding.[12]

Factors given for distress and impairment in fertility treatment were "age" by 86 women (72.9%), "economic burden" by 83 women (70.3%), "psychological anxiety" by 75 women (63.6%), and "physical suffering" by 33 women (28.0%).

In a study by Imanaka et al., "physical burden," "psychological burden," and "economic burden" claimed by 60.0%, 84.1%, and 89.1% respondents, respectively, but no correlation was evident between feelings of economic burden and duration of fertility treatment, and the psychological burden increased even soon after the start of treatment, and the psychological burden increased even soon after the start of fertility treatment.[2] They also pointed out that the percentage of women who felt a burden was related to the treatment, with women receiving IVF in particular feeling a greater burden than women receiving other treatments. Conversely, reports have also described no difference in levels of anxiety between advanced reproductive medicine and general fertility treatment.[13]

Women mostly confided their anxieties and distress to their husbands or families and friends, but a reasonable number of patients also said they talked to doctors and nurses. This highlights that fact that more than a few patients may experience a sense of isolation from a sense of guilt or remorse about fertility treatment that they cannot express to their husband or family and receive treatment in a state of internal chaos.

This suggests a need for specialist doctors and nurses to stay close and guide patients through the process. In fact, many subjects who had no history of fertility treatment responded that they confided in nurses.

Kubo pointed out that changes in individual lifestyles are closely related to the social and economic freedom of women but that this also increased causes of infertility due to age or other factors and that about 80% of the causes of

Table 5 Comparison of responses by subject age, desire for pregnancy after marriage, and history of fertility treatment (multiple responses)

	Patient age		Desire for pregnancy soon after marriage		History of fertility treatment	
	≤39 years	≥40 years	Yes	No	Yes	No
Reason for anxiety						
Possibility of pregnancy	55/72 (76.4%)	42/48 (87.5%)	51/66 (77.3%)	46/54 (85.2%)	83/106 (78.3%)	14/15 (93.3%)
Unborn child	28/72 (38.9%)	24/48 (50.0%)	29/66 (43.9%)	23/54 (42.6%)	45/106 (42.5%)	7/15 (46.7%)
Poor physical condition	22/72 (30.6%)	19/48 (39.6%)	22/66 (33.3%)	19/54 (35.2%)	34/106 (32.1%)	7/15 (46.7%)
Relationship with husband	9/72 (12.5%)	6/48 (12.5%)	8/66 (12.1%)	7/54 (13.0%)	13/106 (12.3%)	2/15 (13.3%)
Factors in distress and impairment						
Age	37/72 (51.4%)*	42/48 (87.5%)*	39/66 (59.1%)	40/54 (74.1%)	66/106 (62.3%)	13/15 (86.7%)
Economic burden	48/72 (66.7%)	30/48 (62.5%)	36/66 (54.5%)*	42/54 (77.8%)*	66/106 (62.3%)	12/15 (80.0%)
Psychological burden	44/72 (61.1%)	28/48 (58.3%)	36/66 (54.5%)	36/54 (66.7%)	66/106 (62.3%)	6/15 (40.0%)
Time to visit clinic	32/72 (44.4%)	20/48 (41.7%)	25/66 (37.9%)	27/54 (50.0%)	49/106 (46.2%)	3/15 (20.0%)
Understanding in workplace	17/72 (23.6%)	12/48 (25.0%)	14/66 (21.2%)	15/54 (27.8%)	27/106 (25.5%)	2/15 (13.3%)
Physical suffering	17/72 (23.6%)	14/48 (29.2%)	17/66 (25.8%)	14/54 (25.9%)	24/106 (22.6%)	7/15 (46.7%)
Understanding of society	14/72 (19.4%)	10/48 (20.8%)	11/66 (16.7%)	13/54 (24.1%)	22/106 (20.8%)	2/15 (13.3%)
Insufficient/excessive information	7/72 (9.7%)	4/48 (8.3%)	6/66 (9.1%)	5/54 (9.3%)	10/106 (9.4%)	1/15 (6.7%)
Lack of cooperation from husband	4/72 (5.6%)	2/48 (4.2%)	1/66 (1.5%)	5/54 (9.3%)	5/106 (4.7%)	1/15 (6.7%)
Understanding of family	3/72 (4.2%)	3/48 (6.3%)	4/66 (6.1%)	2/54 (3.7%)	6/106 (5.7%)	0/15 (0.0%)
Person to confide in about anxiety and distress						
Husband	53/72 (73.6%)	37/48 (77.1%)	49/66 (74.2%)	41/54 (75.9%)	76/106 (71.7%)	14/15 (93.3%)
Friend/acquaintance	33/72 (45.8%)	23/48 (47.9%)	27/66 (40.9%)	29/54 (53.7%)	49/106 (46.2%)	7/15 (46.7%)
Family/natural mother	20/72 (27.8%)	14/48 (29.2%)	23/66 (34.8%)	11/54 (20.4%)	29/106 (27.4%)	5/15 (33.3%)
Doctor	8/72 (11.1%)	7/48 (14.6%)	6/66 (9.1%)	9/54 (16.7%)	12/106 (11.3%)	3/15 (20.0%)
Nurse	6/72 (8.3%)	7/48 (14.6%)	5/66 (7.6%)	8/54 (14.8%)	9/106 (8.5%)	4/15 (26.7%)

* Significant difference between two groups ($p<0.05$)
Note: "Other" was excluded from all comparisons.

infertility fall into this category.[12] Kubo also presented four lifestyle factors to target in preventing infertility: obesity, smoking, sexually transmitted diseases, and age. Likewise in the results of the present study, 75.2% of subjects were ≥35 years old and 85.1% had no children. In actual clinical practice, many cases are seen in which women want to achieve a balance between work and family and to work for a certain period and advance their career before becoming pregnant, by which point pregnancy has become more difficult.

Conflicts of interest: None declared.

References

1) Abe M, Tanaka H, Natori M. Pregnant Women after Sterility Treatment. Perinat Med. 2006; 36: 553-6.
2) Imanaka M, Fujii M, Tamaue M, Hirota A, Matsuura H, Wada Y, et al. Attitude Survey regarding Stress and Work-taking of Women Who Underwent Sterility Treatment (1) — Physical Stress, Spiritual Stress, Economical Stress and Time Pressure. J Fert Implant. 2013; 29: 105-8.
3) Matsuura D, Kuroda K, Nishida A, Kawaji M, Inoue M, Kohaya N, et al. The Influence of Stress experienced by Women in Sterility Treatment on Work Family Conflict. J Fert Implant. 2013; 30: 105-10.
4) Nursing Guidance for Supporting Infertile Patients — the Process of Infertility Checkup and Treatment. http://hdl.handle.net/10285/4668 [2015.05.25].

5）NPO Japan Reproductive Health Association: Supporting your first pregnancy www.premama.jp [2017.2.12].
6）Labor Standards Act. http://law.e-gov.go.jp/htaldata/S22/S22H0049.html [2015.05.25].
7）Basic Act for Measures to Cope with Society with Declining Birthrate. http://law.e-gov.go.jp/htmldata/H15/H15H0133.html [2015.05.25].
8）anxiety word https://kotobank.jp [2017.02.12].
9）Outline of 2013 Population Survey Report (Exact Number) http://www.mhlw.go.jp/toukei/saikin/hw/jinkou/kakutei13/index.html [2016.11.8].
10）Kawamata K, Kawachiya S, Abe T, Wada K, Fukuda J, Shinohara K, et al. IVF Treatment Results of Elderly Persons. J Fert Implant. 2012; 29: 48-51.
11）Menken J, Trussell J, Larsen U. Age and Infertility. Science. 1986; 233: 1389-94.
12）Bunting L, Tsibulsky I, Boivin J. Fertility Knowledge and Beliefs about Fertility Treatment: Findings from the International Fertility Decision-making Study. Hum Reprod. 2013; 28: 385-97.
13）Kubo H. Process from Infertility Treatment to Prevention. Matern Child Health Inf. 2012; 66: 1-4.