Original Article

Knowledge gaps among healthcare professionals regarding infertility: Exploring educational needs in primary healthcare setting-Morocco

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Abstract:

BACKGROUND: The role of healthcare professionals (HCPs) is paramount in improving fertility awareness and practices. This study aimed to explore the level of infertility knowledge among primary care providers in Fez-Meknes, Morocco.

MATERIALS AND METHODS: A cross-sectional study was carried out in July–September 2023 concerning HCPs practicing in primary care establishments employing a snowball sampling technique. The questionnaire was designed and validated by an expert panel of sexual and reproductive health (SRH). It was consisted of 14 items concerning infertility knowledge and gives a score between 0 and 14. The basic infertility knowledge score (BIKS) was obtained to assess HCPs knowledge level.

RESULTS: 641 HCPs were included; they had low level about basic knowledge of infertility. The total BIKS average of HCPs was found to be "05.08 ± 01.99". The mean nurses' score was "5.11 ± 2.02" and midwives' score was "5.03±;1.93". Three-quarters (75.4%) of respondents scored <7 to the 14 questions. Almost 60% did not know neither the meaning of primary infertility nor secondary infertility; just 27.9% reported that infertility is considered a disease by the WHO, and only 9% recognized the prevalence of infertility in Morocco. Education level and practicing setting were significantly associated with correct responses, 10^{-3} and 0,02, respectively.

CONCLUSION: The finding of our survey asserts that nurses and midwives in primary healthcare lack basic knowledge about infertility. It is essential to provide them an appropriate education to assist Moroccan couple who are seeking their parental project as part of the promotion of SHR for all.

Keywords:

Infertility, knowledge, primary healthcare professionals, Morocco

Introduction

The role of the healthcare professionals (HCPs), in particular nurses and midwives, is paramount in the promotion of reproductive health, especially the improvement of fertility awareness and practices. They are often ranked as the most trusted source for seeking fertility information.[1] They are involved in the management of infertility: prevention, diagnosis, therapy, shared decision-making, support and education regarding infertility couples.[2] However, studies have shown gaps in knowledge and skills hindering HCPs optimal screening and management of patients seeking fertility care,[1,3-6] Indeed, treatment seeking is influenced by several factors including high social support for encouraging treatment, advanced health literacy,[7] poor understanding of treatment options and inadequate referral patterns of primary care providers.[8] Moreover, delays to initial consultation and treatment

for infertile couple were significantly associated with reported supportive service offerings by healthcare professionals.[9]

Infertility is defined as a disease characterized by the failure to establish a clinical pregnancy after 12 months of regular, unprotected sexual intercourse.[10] Experience with infertility can have a negative effect on an individual's psychological and social health.[11] Indeed, the physical and emotional well-being of couples can be further harmed by social pressure and stigma associated with childlessness. This needs to be addressed before starting treatment for infertility to improve the response to treatment.[12]

According to the World Health Organization (WHO), infertility affects millions of people – and has an impact on their families and communities. Estimates suggest that approximately one in every six people of reproductive age worldwide experience infertility in their lifetime.[13] In Morocco, recent polls have estimated that 15% of the population suffer from infertility, and among these couple, more than a third has been waiting for a child more than three years.[14]

The health care system in Morocco is pyramidal, integrated, hierarchical and based on primary health care services (PHS) which are the first contact a person has with the health system when they have a health problem. They are the keystone of the Moroccan health system.[15] PHS includes a broad range of health services among others rights of women and couples in accessing and benefiting from comprehensive, reproductive and maternal health services based on the Alma Ata recommendations.[16] Every PHS in Morocco has a midwife or a nurse trained in maternal and child care who must participate in promoting SRH. In fact, a resourceful knowledgeable practitioner can guide infertile couple through their journey.[17] Thus, this study aimed to explore the level of infertility knowledge among primary care providers in Fez-Meknes, Morocco, to highlight gaps in knowledge and identify educational needs of infertility care.

Materials and Methods

Study design and setting
A cross-sectional study was conducted from July to September in the region of Fez-Meknes in 2023 concerning HCPs practicing in primary care establishments; ten health centers level 1 and 2 among were included. The choice of health centers was based on criteria of geographic diversity (rural, urban).

Study participants and sampling
641 HCPs participated in the study employing Snowball sampling method. In this article HCPs refers to midwives and nurses practicing in primary care establishments, who are responsible for several programs especially, maternal and child care including family planning and immunization against the major infectious diseases.

The sample size was calculated according to the following formula:

$$n = z^2 \cdot p \, (1-p)/e^2 = (1.96)^2 \cdot 0.5^* \, (0,5)/(0.04)^2 = 601 \text{ HCPs}$$

(n: sample size/z: confidence interval of 95%/e: Precision at 4%/p: prevalence at 50%) prevalence at 50%)

Data collection tool and technique
The study used a questionnaire to explore infertility knowledge; it was designed after consulting the literature review and validated by an expert panel of SRH. The questionnaire was administered by trained and experienced interviewers specializing in midwifery or nursing. Participants were asked about demographic information as well as age, gender, experience, education level, specialty and practicing setting; in addition, the questionnaire was consisted of 14 items exploring basic infertility knowledge (BIK). The assessment of knowledge is organized according to three topics regarding infertility: definition and scale of the problem (a), Frequency, diagnosis, causes and risk factors (b), infertility management circuit (c). The BIK required environ 15 min to complete and included close-ended questions. A BIKS gives a score between 0 and 14, with the total score calculated by adding up the correct answers (each correct answer = 1 point; each wrong answer or no answer = 0 point). Higher scores indicate more accurate knowledge about infertility.

Data were entered in Excel software then analyzed using SPSS V25 software. Quantitative variables were presented as average ± standard deviation (and/or median). Qualitative variables are in percentages. A univariate analysis of factors likely to be related to the HCP's level in basic infertility knowledge was performed, using the appropriate tests: Student's *t*-test, Pearson's Chi-squared test. The significance level (*P* value) of the results obtained after data analysis was set at 0.05 (5%).

Ethical consideration
Favorable ethical approval was obtained from the Research Ethics Committee of the faculty of medicine in Fez referenced under No. 11/22. In addition, the right to self-determination was respected: all participants were informed that they were free to participate or not, as well as to refuse to participate and/or to withdraw at any time without having to justify their decision. The right to anonymity and confidentiality was rigorously respected, since the tools used contained no indication likely to identify the participant.

Results

As summarized in Table 1, the survey was completed by 641 HCPs (542 women, 99 men) with a mean age of 35,21 ± 9,82 years. The average duration of experience was found to be 11.89 years, with a percentage of 54.4% having practiced for more than 10 years, and over 95% of HCPs had not benefited from any ongoing training in the infertility education field. Less than half (44.46%) of providers were midwives; the majority of participants work in urban areas (84.39%) and had a bachelor's degree in nursing science and health techniques (87.52%).

Overall, the study findings show that both nurses and midwives had very low level about basic knowledge of infertility whether it's the definition and causes, screening and diagnosis, patient circuit and management. Indeed, almost 60% did not know neither the meaning of primary infertility nor secondary infertility, just 27.9% reported that infertility is considered as a disease by the WHO, only 9% recognized the prevalence rate of infertility in Morocco, and 12.9% were aware of the age when female fertility starts to decline. However, almost two-thirds were aware that infertility origin is due to men and women etiologies (61.3%) and they are another risk factor that may affect the fertility of the couple (62.6%) such as tobacco, alcohol, obesity, lifestyle and impact of environment. Besides, 56.5% confirmed a sperm analysis as a first analysis exploring a man's fertility.

Regarding management of infertility, 28.9% stated that they know the AR, 20.3% only are aware that infertility can be managed by a general practitioner, only 11.5% Know establishments that offering infertility care even the most of the participants, and 74.4% recognize the role of the gynecologist [Table 2].

The total BIKS average of HCPs was found to be 05.08 ± 01.99. The mean nurses' score was "5.11 ± 2.02" and midwives' score was "5.03±;1.93". Three quarters (75.4%) of respondents scored <7 of the 14 questions [Figure 1]. Regarding the association of socio-demographic factors with level of knowledge, there were no statistically significant differences in knowledge scores relating to respondents' age group, gender, experience, specialty, ongoing training in infertility. Conversely, education level and practicing setting were significantly associated with a greater likelihood of correct response, 10⁻³ and 0,02, respectively [Table 3].

Discussion

Basic infertility knowledge of HCPs appeared to be insufficient in this study. For example, fewer than 10 percent of them estimates the prevalence of infertility in Morocco, and the majority do not recognize that is an illness (27.9%) nevertheless in 2009, the WHO recognized

Table 1: Sociodemographic and professional characteristics of study participants

| Variables	% (*n*=641)
	M±SD
Age group (years)	35.21±9,82
<30	31.67
[30-40]	43.37
≥40	24.96
	M±SD
Experience (years) M±SD	11.89±9.00
<05	25.27
[05-10]	20.28
[10-20]	35.57
≥20	18.88
Gender	
Female	84.40
Male	15.60
Specialty	
Nurse	56.00
Midwife	44.00
Practicing setting	
Rural	15.60
Urban	84.40
Education level	
Bachelor's degree	87.52
Master's degree-doctorate	12.48
Ongoing training in infertility	
Oui	04.10
Non	95.90

M: Mean; SD: Sample standard deviation
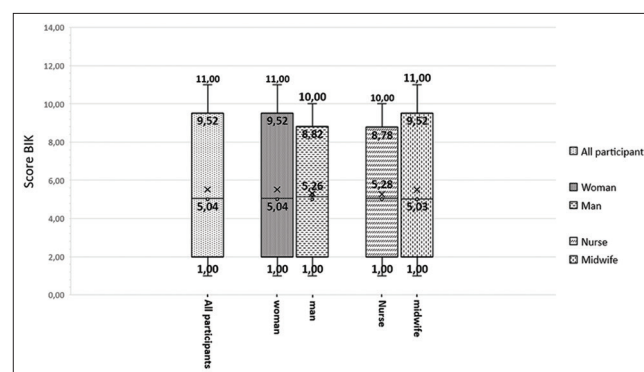
Figure 1: Mean scores of knowledges distributed by gender and specialty. BIKS: Basic infertility knowledge score

infertility as a disease; it affects between 48 and 186 million of people around the world and nearly 72.4 million of women.[18] Recent reports from Moroccan society of reproduction medicine have shown that 15% of all couples frequently experience infertility, and the average duration of infertility treatment seeking at primary healthcare setting is estimated to be five years.[14-19]

Moreover, accurate knowledge about the prevalence of infertility and awareness of its major challenges are essential for providers of SRH care as well as

Table 2: Infertility knowledge of participants by topics

Topics	Questions	Correct answers	%
Definition & scale	What is the prevalence of infertility in Morocco?	60	9.4
	Does infertility considered as a disease by the WHO?	179	27.9
	What is secondary infertility	245	38.2
	What is infertility?	251	39.2
Diagnosis causes & risk factors	At what age does female fertility start to decline	83	12.9
	What is an anti-müllerian hormone (AMH) test?	245	38.2
	What is the first analysis exploring man's fertility testing?	362	56.5
	The causes of couple's infertility are of female origin?	393	61.3
	Are there risk factors favoring infertility?	401	62.6
Management & Circuit	infertility care is only available in ART centers?	74	11.5
	Infertility can be managed by a general practitioner in a primary care setting?	130	20.3
	Couples can benefit from infertility care in primary care facilities?	171	26.7
	What is Assisted Reproductive Technology (ART)?	185	28.9
	If necessary, infertile couples will be referred to the gynecologist to a higher level?	477	74.4

Table 3: Factors influencing healthcare professionals' knowledge

	BIKS (M±SD)	Test	*P*
Age group (years)			
<30	05.17±1,89	0.604	0.42
[30-40]	04.96±2,03		
≥40	05.17±2,04		
Experience (years)			
<05	05.16±1.93	0.378	0.68
[05-10]	05.15±2.03		
[10-20]	05.00±2.05		
≥20	05.05±1.93		
Gender			
Female	05.04±1.98	0.953	0.32
Male	05.26±2.01		
Specialty			
Nurse	05.11±2.04	0.251	0.61
Midwife	05.03±1.93		
Practicing setting			
Rural	04.67±1.84	5.108	0.02
Urban	05.15±2.01		
Education level			
Bachelor's degree	05.21±2.03	10.174	10^{-3}
Master's degree-doctorate	04.17±1.41		
Ongoing training in infertility			
Yes	05.03±2.16	0.013	0.90
No	05.08±1.98		

BIKS: Basic infertility knowledge score; P : Probability value. The variables were compared using the *t* test for independent samples, the 1-factor ANOVA test, the significance level (*P*) of the results obtained after data analysis was set at 0.05 (5%)

policy-makers and[19,20] respondents' answers regarding the diagnosis of infertility are disparate; more than half of HCPs affirmed the semen analysis as first examination exploring man's fertility but just 38.2% acknowledge the anti-Müllerian hormone (AMH) test, and only 12.9% are aware about the age at which ovarian reserve decline.

In other words, questions about female infertility such as infertility evaluation were poorly understood by overall HCPs even if infertility can involve both female and male partners. Indeed, the criteria for initial assessing the infertility of couples must be mastered by all HCPs that include: the ovarian reserve, ovulatory status, structure and patency of the female reproductive tract and male semen parameters.[21] Causes and risk factors were relatively well known to participants. So it is important to stress that for couples and clinicians, a diagnosis of infertility is a crucial phase; it signals the start of investigations and possible treatment.[20]

Furthermore, most participants have suboptimal knowledge regarding management of infertility; more than 70 percent don't have any idea about ART, pathways of treatment seeking, the possibility of follow-up with a general practitioner and the availability of fertility care in primary healthcare facilities. Whereas health professionals must be involved at least in the provision of correct information to patients, this includes counselling and management, advice on lifestyle and health, referring the couple to a higher level of care if possible and appropriate.[22] Therefore, counseling can change the attitude toward infertility in infertile people,[23] and appropriate education of HCPs, in particular nurses and midwives practicing in primary healthcare establishments, is essential to provide effective fertility related education.[24] The limited knowledge and prevailing mis-conceptions regarding infertility need to be sincerely dealt with to complement the medical treatment of infertility.[12]

Finally, as well as supporting infertile couples, health professionals must also assist young Moroccans by raising their awareness about fertility in order to upgrade their level of knowledge and attitudes.[25]

On the other hand, supportive interventions are used to assist family members of infertile couples in altering their perceptions of the problem and preserving their positive

relationships with infertile couples. It is anticipated that their encouragement will convince the couples to adhere to the treatment protocol.[26]

Conclusion

In Morocco, infertility affects 15% of couples and is considered a major public health issue that affects families and communities. The finding of our survey asserts there is insufficient basic knowledge about the field of infertility around nurses and midwives. Institutionalized education programs including initial training curriculum for the nursing and midwifery students. continuing training courses on infertility for HCPs and providing standardized guidelines in primary healthcare establishments should be implemented to address knowledge gaps among health professionals who are the cornerstone of healthcare in Morocco. All these initiatives will help to develop and update the knowledge and skills of HCPs that will allow to improving Moroccan couples' fundamental knowledge and awareness of their fertility and assist those who are seeking their parental project and the other hand these actions will help to promote SRH services for all and to achieve the universal health coverage of SRH by 2030.

Acknowledgment

Study limitations
In our case study, we noted some limitations in the sample; the target population was only nurses and midwives, and however, the role of physicians is central in the scope of infertility as general practitioner. These limitations will be the subject of future studies.

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Conflicts of interest
There are no conflicts of interest.

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