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Health Information-Seeking Behavior of Iranian first-time Mothers and First-Time Pregnant Women in Northwest Health Centers of Tehran

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ABSTRACT

Introduction: Pregnancy, especially the first pregnancy and childbirth, affects the women's quality of life. Improving information-seeking behavior facilitates the decision-making process of women during pregnancy and postpartum. The aim of this study was to investigate the health information-seeking behavior of Iranian first-time mothers and first-time pregnant women.

Methods: This research was a cross-sectional-descriptive survey .A self-administered questionnaire was distributed among 358 first-time mothers and first-time pregnant women who attended 9 health centers in the northwest of Tehran, Iran, in 2017. Data were analyzed using SPSS version 24 and by conducting descriptive statistics and Kruskal-Wallis and Mann-Whitney U tests at .05 significance level.

Result: The most important information need of the first- time mothers and first-time pregnant women was "Fetal/newborn health"; the most important source of information used was "gynecologist"; the most important way to access the resources was "visiting a doctor in person," and the most critical barrier to access information was "high costs of visiting a doctor, midwife, or nurse." Testing the hypotheses showed significant differences between information seeking components and demographic characteristics of the respondents. It was also found that there was no significant difference between the components of information-seeking behavior among two groups of first-time mothers and first-time pregnant women ($p>0.05$).

Conclusion: Making pregnancy-related health information more available and accessible and providing high-quality educational programs at affordable cost in health centers for first-time mothers and first-time pregnant women can help them increase their health literacy and prevent many common complications associated with pregnancy and child health.

Keywords: Information seeking behavior, Pregnant women, Pregnancy, Primigravida, Primipara

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Introduction

First pregnancy and becoming a mother is a major life event for women. Substantial physical, psychological and sociological changes affect women's life during this developmental period. Access to adequate, useful information is crucial to ensure a healthy life for the mother and her baby (1). The mothers' access to relevant health information could have a lot of influences on healthy pregnancy, infant's health, and hence reducing maternal or fetal mortality (2, 3) .Nevertheless, young mothers' unmet information needs in their first pregnancy and their demand for accessing necessary information is a challenge for information providers, as this challenge is mixed with a limited understanding of the mothers' information needs (4). Information behavior begins with acknowledging a need for information and refers to activities that an individual performs to access information to meet his/her information needs (5, 6).

Pregnant mothers and newborns are more vulnerable to illness and death. (7) In particular, first-time pregnant mothers are more likely to develop postpartum depression, anemia, gestational diabetes, and gestational hypertension compared to those who have experienced several pregnancies (8-11). Therefore, providing health services for first-time mothers is considered one of the most important aspects of primary health care (8, 12). In a survey of 2366 mothers, over 40% of them reported unmet information needs during antenatal and postnatal care (13). Lack of adequate information on pregnancy complications and childbirth and issues related to taking care of newborns are some of the problems that expectant mothers often face. Unfortunately, pregnancy may lead to undesirable outcomes, too, especially in developing countries, where pregnancy and childbirth complications are the main causes of death for women in their reproductive age. Lack of knowledge about contraception and pregnancy complications were reported as one of the main factors that increase the risk of illness and death among pregnant women in developing countries (4, 14-16).

Access to healthcare services is considered an essential factor in reducing the maternal mortality rate. Nevertheless, mothers in many developing countries continue to receive pregnancy and childbirth services as the last substitute for their health care needs. This is mainly due to the women's lack of information on the importance and use of maternal health care. Women's social, cultural, and economic status is also effective in constituting this attitude and behavior (17-19). Educating mothers and improving their information-seeking behavior plays an essential role in raising awareness about pregnancy and maternity care, reducing the maternal mortality rate (17, 20, 21). UNICEF also considered access to information, counseling, and pregnancy services as one of the main global strategies to improve mothers' health during pregnancy (22).

Therefore, supporting women with relevant health information during pregnancy and transition to motherhood can help them take on their new role with a greater sense of readiness and self-confidence (4). Pregnant women need various information during pregnancy. Access to information increases pregnant women's self-confidence, improves their lifestyle, reduces their stress and negative emotions during pregnancy, and reduces labor pain during childbirth (12, 23-25). It also helps expectant mothers make informed decisions about their own health and their newborns and manage their pregnancy effectively (17). As a result, it can prevent many maternal and infant deaths (14, 26).

Understanding the first-time mothers' health information needs and seeking behavior helps identify their health issues and threats, improve clinical decision-making regarding their health issues, facilitate healthcare providers' interactions with mothers, and identify resources available when stressful situations occur (23). Providing appropriate health care services and raising awareness and knowledge of pregnant women through educational and counseling programs before, during, and after pregnancy will considerably prevent maternal and infant

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mortality and make the mother ready to give birth and take care of themselves and their newborns (27).

Previous studies showed the quality of pregnancy services and the availability of these services, as well as the strategies to encourage mothers to access and receive pregnant information around the country, including in the health centers, is not quite desirable (28-30). Some of the factors that prevent providing appropriate pregnancy care include limited access of mothers to educational programs, mothers' low literacy and lack of awareness, religious or personal barriers, lack of services and facilities available, a long distance from the healthcare facilities, and financial problems (31). Taybi also stated that the main obstacles to the implementation of the maternity and pregnancy care package are the lack of mothers' awareness and information about the package, lack of communication between health centers, and the manager's lack of attention to information deficiencies in the centers (32).

In conclusion, poor information services to mothers and pregnant women, limited information resources available, mothers' lack of knowledge and awareness, and lack of familiarity with pregnant mothers' information-seeking behavior were evident in the previous research. In particular, first-time mothers and first-time pregnant women's information-seeking behavior, including their information needs, information sources, access methods, and challenges in accessing the information, were rarely addressed in the Iranian literature. Therefore, the present study attempted to investigate first-time mothers' information-seeking behavior and first-time pregnant women in Tehran, Iran.

Methods

The cross-sectional-descriptive survey was used to conduct the study. The population of the study consisted of 4378 first-time mothers (who had just experienced their first delivery and their child was under-one-year-old) and 842 first-time pregnant women (being within the 4 to 40 weeks of their pregnancy) referred to 9 health centers in the northwest of Tehran under the supervision of Iran University of Medical Sciences in 2017. A simple random sampling method was used to select the participants from the two groups of first-time mothers and first-time pregnant women separately and based on their proportion. Using Cochran's formula (at confidence level of 95% and error coefficient of 0.05%), the sample size was estimated as 358 first-time mothers and first-time pregnant women.

$$n=\frac{\frac{Z^2pq}{d^2}}{1+\frac{1}{N}\left(\frac{Z^2pq}{d^2}-1\right)}$$

$Z = 1.96, p=q=0.5, d=0.05, N= N_1 (4378) + N_2 (842) = 5220$

A self-administered questionnaire used for data collection was designed based on the Das (33) and Guelph's (34) studies. The questionnaire had four main parts. First, personal information, including age, job, education level, first pregnancy/ motherhood experience, and income level, were asked. The main questions, including questions about pregnant women's information needs, information resources, access methods, and barriers, were asked. The questions were based on a Likert scale of 1-5, with 1 meaning "very low" and 5 meaning "very high." Face validity of the questionnaire was obtained by asking the opinions of three faculty members in midwifery and five faculty members in the library and information science to assess clarity, grammar, readability, and relevance of the items to the research questions. As a result, some questions were removed, and some were revised. The questionnaire's reliability was obtained by estimating the Cronbach's alpha coefficient ($\alpha = 0.86$) on a sample of 36 participants, indicating acceptable reliability.

The questionnaires were distributed in person and randomly among the study population after obtaining verbal consent. The questionnaires were completed by women themselves under the supervision of one of the researchers. Of 358 questionnaires distributed 294 questionnaires were returned (the response rate = 82.22%). Data were analyzed using descriptive statistics (frequency, frequency percentage, mean, standard deviation) and inferential statistics (Kruskal Wallis and Mann

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Whitney) using the SPSS software version 24 at a significance level of 0.05. Kolmogorov–Smirnov test was also performed in order to check data for normal distribution. The results showed non-normal distribution for "information needs" (P = 0.001), "information resources" (P = 0.041), "information accessing methods" (P = 0.0001), barriers to access information" (P = 0.038). As a result, relevant non-parametric statistics were used for testing the research hypotheses.

Results

The mean age of the women who participated in the study was 28.83 years, the lowest was 18, and the highest was 38. More than half of the participants (73%) had experienced their first birth and had just one child who was under-one-year-old (first-time mother), and the rest (27%) were pregnant for the first time and had not yet experienced childbirth (first-time pregnant woman).

In terms of the education level, the majority of the participants had a bachelor's degree (36.4%) followed by a diploma (24.1%), master's degree (13.4%), associate's degree (12.7%), under diploma (11%), and the doctoral degree (2.4%). The majority of the participants (69%) were housewives. The rest were either employee (26.2%), student (2%), or self-employed (2.8).

Using a questionnaire, the health information-seeking behavior of the first-time mothers and first-time pregnant women in Northwest Health Centers of Tehran, Iran, was assessed in four areas: information needs, information resources, information accessing method, and information barriers.

Table 1 shows the information needs of first-time mothers and first-time pregnant women. As the table shows, the main information need of the first-time mothers and first-time pregnant women was related to "Fetal/newborn health". The other important information needs were reported as follows: "neonatal vaccination," "newborn care and communication practices," "lactation" and "infant nutrition and supplements." While the need for information about "abortion," "sexual relations during pregnancy," and "the amount of activity (household/physical) during the pregnancy" were ranked as less important information needs of the first-time mothers and first-time pregnant women.

Table 1. The information needs of first-time mothers and first-time pregnant women

Information needs	Mean	SD	Ranking
Fetal/newborn health	4.043	1.064	1
Neonatal vaccination	4.004	1.046	2
Newborn care and communication practices	3.961	1.015	3
Lactation	3.943	1.093	4
Infant nutrition and supplements	3.926	1.078	5
Signs of danger and common illnesses associated with infants	3.903	1.152	6
Nutrition and the mother's diet	3.835	1.098	7
Common problems of infancy (Including bloating, reflux, colic, jaundice, constipation, diarrhea)	3.826	1.095	8
Natural delivery/cesarean	3.708	1.708	9
Ultrasound and pregnancy tests	3.701	1.073	10
Child-related products (such as baby clothes, etc.)	3.658	1.122	11
Pregnancy and postpartum care	3.633	1.059	12
How to lose weight after childbirth	3.590	1.156	13
The cost of normal and cesarean delivery	3.557	1.172	14
Health care provider centers	3.555	1.095	15
Medications during pregnancy and after delivery	3.553	1.147	16
Non-pharmacological pain reduction methods at delivery	3.500	1.191	17
Complications of pregnancy	3.434	1.168	18
Common diseases of pregnancy (such as: diabetes, bleeding, premature rupture of membranes, decreased fetal movements)	3.368	1.309	19
Depression during pregnancy and postpartum	3.303	1.252	20
The amount of activity (household/physical) during pregnancy	3.244	1.054	21
Sexual relationships during pregnancy	3.139	1.187	22
Abortion	2.95	1.249	23

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Table 2 shows the information resources used by first-time mothers and first-time pregnant women. The most important and the first source of information for pregnant women was the "gynecologist," which was used most of the time by the participants. Next, the "mother," "public search on the Internet," the "husband," and "books" were respectively used as primary sources of information by pregnant women. "Telephone counseling line" and "DVD / Video" were less frequently used as information sources during the pregnancy.

Table 2. Information resources used by first-time mothers and first-time pregnant women

Information resources	Mean	SD	Ranking
Gynecologist	4.126	0.918	1
Mother	3.780	3.654	2
Public search on the Internet	3.360	1.509	3
Husband	3.268	1.323	4
Books	3.139	1.275	5
TV/radio programs	2.960	1.133	6
Groups related to pregnancy and childbirth in social networks (such as Telegram, Instagram, WhatsApp, Facebook, etc.)	2.856	1.500	7
Friends	2.785	1.141	8
Midwife, nurse	2.748	1.188	9
Mother-in-law	2.725	1.277	10
Internet Forum on pregnancy and parenting	2.708	1.544	11
Educational brochures	2.623	1.192	12
Magazines	2.584	1.250	13
Relatives other than mother, mother-in-law, and husband	2.241	1.095	14
Mobile-based pregnancy applications	2.208	1.402	15
Participation in educational programs and classes for pregnant women and mothers	2.193	1.219	16
Other medical staff	2.169	1.013	17
DVD / video	2.102	1.102	18
Telephone counseling line	1.540	0.963	19

Table 3 shows the methods used by first-time mothers and first-time pregnant women for accessing the information resources. "Visiting a doctor in person" was reported as the first way to access information resources. Using the "phone," "social networks relevant to pregnancy/parenting," "Internet communities on pregnancy/parenting, "and using "SMS" were other most used methods of accessing the information resources by first-time mothers and first-time pregnant women. On the other hand, they were not interested in getting information through "Video chat/online chat" and "email."

Table 3. Methods of access to information resources by first-time mothers and first-time pregnant women

Access method	Mean	SD	Ranking
Visiting a doctor in person	4.700	0.713	1
Phone	3.785	1.080	2
Social networks relevant to pregnancy/parenting	3.300	1.393	3
Internet Communities on pregnancy/parenting	3.192	1.414	4
SMS	3.078	1.242	5
Video chat / online chat	2.685	1.265	6
Email	2.601	1.165	7

Table 4 shows the barriers to access and obtain pregnancy information. First-time mothers and first-time pregnant women mentioned that the "high costs of visiting a doctor, midwife, or nurse" were the main barriers. Subsequently, "insufficient counseling centers," "insufficient time given by the doctor, midwife, or nurse for advice and information," "failure to refer to the clinic due to the need to take care of the family/child" "the doctor, midwife, or nurse do

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not recommend valid references (such as books, magazines, websites)" were other main barriers mentioned by first-time mothers and first-time pregnant women.

Table 4. Barriers to access information among first-time mothers and first-time pregnant women

Barriers to access information	Mean	SD	Ranking
High costs of visiting a doctor, midwife, or nurse	3.718	1.338	1
Insufficient counseling centers	3.338	1.453	2
The insufficient time given by the doctor, midwife, or nurse for advice and information	3.067	1.351	3
Failure to refer to the clinic due to the need to take care of the family/child	3.048	1.275	4
The doctor, midwife, or nurse do not recommend valid references (such as books, magazines, websites) by	2.832	1.341	5
I feel anxious when I receive too much information	2.791	1.224	6
My husband does not help me much in obtaining the health information	2.768	1.079	7
Not having someone to accompany to the clinic	2.752	1.180	8
High costs of purchasing a book or Internet access	2.697	1.265	9
A very long distance between the home and the clinic	2.619	1.113	10
I feel fear/embarrassment to ask for information	2.485	1.007	11
It's not necessary to talk about all things	2.441	1.178	12
Healthcare staff behave inappropriately	2.440	0.960	13
Don't need any information. I know almost everything about pregnancy and childcare	2.413	1.108	14

Table 5 shows the results of the Kruskal Wallis test examining the relationship between the demographic characteristics and the components of the information-seeking behavior of the first-time mothers and first-time pregnant women. The results showed no significant differences between the information needs of first-time mothers and first-time pregnant women and their demographic characteristics such as education level, income, age, and job. However, significant differences were found between the information resources used by first-time mothers and first-time pregnant women and all the demographic characteristics studied. Similarly, there were significant differences between information accessing methods of the first-time mothers and first-time pregnant women and all the demographic characteristics studied except the age that the hypothesis was not supported. Moreover, significant differences were found between the barriers to access information and the participants' education levels, age, place of residence, and job. However, the relationship between income and barriers to access information among first-time mothers and first-time pregnant women was not supported.

Table 5. The relationship between demographic characteristics and the components of the information-seeking behavior of first-time mothers and first-time pregnant women

Demographic characteristics	Information seeking components											
	Information needs			Information resources			Information accessing methods			Barriers to access information		
	df	Chi-Square	p	df	Chi-Square	p	df	Chi-Square	sig	df	Chi-Square	p
Education	5	2.26	0.813	5	28.62	0.001	5	23.12	0.001	5	11.23	0.047
Income	4	5.22	0.265	4	20.05	0.001	4	16.41	0.003	4	3.66	0.454
Residence	8	9.53	0.30	8	31.49	0.001	8	22.82	0.004	8	17.82	0.023
Age	4	7.06	0.133	4	10.83	0.029	4	7.41	0.116	4	10.08	0.039
Job	3	0.41	0.938	3	9.07	0.028	3	9.074	0.028	3	6.52	0.089

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Table 6 shows the results of the Mann- Whitney test examining the differences between information-seeking behavior of the two groups, i.e. first-time mothers and first-time pregnant women. It was found that there are no significant differences between the two groups in all components of information-seeking behavior.

Table 6. The differences between the information-seeking behavior of first-time mother and first-time pregnant women

Information seeking components	Group	Average rating	Z	Mann-Whitney U	sig
Information needs	First-time mothers First-time pregnant women	143.94 141.30	-0.240	7654.500	0.811
Information Resources	First-time mothers First-time pregnant women	135.34 139.66	-0.398	7140.00	0.690
Access method to information	First-time mothers First-time pregnant women	116.81 137.51	-1.953	5692.00	0.051
Obstacles to access information	First-time mothers First-time pregnant women	121.11 141.94	-1.918	6043.00	0.055

Discussions

The purpose of this study was to understand the health information-seeking behavior of first-time mothers and first-time pregnant women, such as their information needs, information resources used, information accessing methods, and barriers in Tehran, Iran. We discuss the results according to the research questions of the study in the following sections.

The findings of the study showed the main information needs of first-time mothers and first-time pregnant women were "Fetal/newborn health," "Neonatal vaccination," "baby care and communication practices," "lactation," and "Infant nutrition and supplements," respectively. Past studies reported different outcomes for the information-seeking behavior of pregnant mothers, based on their study context. For instance, Gholami (27) showed that pregnant women were more interested in obtaining information on "infertility disorders," "diagnosis and treatment," "pregnancy-related problems and pregnancy complications," and "pregnancy measures." Moreover, in Nasrollahzadeh's research (35), the most important information needs of pregnant women were mentioned as "mental needs," "nutrition," "maternal and fetal health," and "delivery methods." In contrast, Das's study findings (36) were in line with the findings of the current study. They reported, "have a healthy child" as the most important information need of pregnant women. Chalak (37) also reported that pregnant women's main information needs are related to "fetal health", which is similar to the current study. The current study revealed other information needs of pregnant women such as "sexual relations during pregnancy" and "activity at home" which had not been identified in their study.

Testing the hypotheses also showed that there were no significant differences between the information needs of the first-time mothers and first-time pregnant women and their demographic characteristics such as age, income, education level, and place of residence. In some studies such as Al Qadire (38) and Zamani (39) on the information behavior of cancer patients and Riahi's research (40) on the information needs of Afghan and Iranian immigrants, significant differences between the information-seeking behavior of the participants and the demographic characteristics such as income, education levels and the place of residence were reported. However, regarding the pregnant women, Das (33) did not observe a correlation between age and education and the components of the information seeking behavior, which are similar to the results of the current study.

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Based on the results of this study, the most important and the first source of information for pregnant women was the "gynecologist," followed by "mothers," " the Internet," "husband," and "books," respectively. The findings of the study are similar to the findings of the past literature. For instance, a study by Szwajcer (41) reported the Internet, books, and experts as the most important information sources used by pregnant women. Bernhardt (42) also reported the Internet as one of the most important information sources for obtaining pregnancy and childcare information. Lewallen (43) reported family members such as spouses and mothers as the most important information sources for pregnant women. Lee's study (44) also reported the Internet, books, and television as the most widely used sources for finding information about pregnancy.

Testing the hypotheses also indicated significant differences between the sources of information used by first-time mothers and first-time pregnant women and their demographic characteristics such as education, income level, place of residence, and job. Similarly, Sutan et al.(6) reported significant relationships between the income and the education level of pregnant women and the health information sources they used. Sayakhot (45) also showed that there is a significant difference between the sources of information used by pregnant women and the age and level of education. In contrast, Zamani (39) found that there is no meaningful relationship between the information sources used by patients and their place of residence, which is contrary to the results of the present study. However, it has been conducted in a different group. According to the results of the current study, pregnant women living in places with fewer facilities are less likely to have access to appropriate pregnancy-related information sources.

The results of this study showed that the main way first-time mothers and first-time pregnant women used to get access to pregnancy- related information sources was “visiting a doctor in person” followed by "phone," "social networks," "Internet communities on Pregnancy/Parenting "and "SMS." Similarly, Szwajcer (41) also reported the Internet as the most important way of accessing pregnant women's information. Almoajel (46) also showed that the Internet and specialized relevant associations were the most important ways to access health information during pregnancy.

Examining the hypotheses also showed that there are significant differences between the methods of accessing the information sources used by first-time mothers and first-time pregnant women and their demographic characteristics such as the level of education, place of residence, and age. However, the relationship between the job and income level and information access methods were not supported. Song (47) reported a significant relationship between income levels and information accessing methods among low-income pregnant women, contrary to the results of the present study. Lalazaryan's (48) also showed a significant relationship between the level of education and the methods of accessing information among diabetic patients, which is in line with the results of this study; however, it has been conducted on a different group. Rutten (49) also stated that people with higher education levels would look for different ways to access the information resources they need.

The results of this study showed that "high costs of visiting a doctor, midwife, or nurse" and "insufficient counseling centers" were the main barriers that first-time mothers and first-time pregnant women face while they seek health information. Nasrollahzadeh (35) reported that the main barriers pregnant women face while information seeking were: “being busy and having little time for information seeking,” “the inability to assess the accuracy of the information,” and “the unsuitability of the pregnancy books for their level of understanding.” Szwajcer (41) also reported that the most important barrier in the information-seeking behavior of pregnant women is insufficient information centers available, which is in line with the results of this study.

In addition, testing the hypotheses showed that there are significant differences between the barriers

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that first-time mothers and first-time pregnant women faced during information seeking and their demographic characteristics such as education level, place of residence, and age. However, the relationship between the barriers and the level of income and job were not supported. Lagan's research (50) showed no significant differences between the age and place of residence and access to pregnancy information and its barriers, which are contrary to the results of this study. Zamani (39) also found no significant difference between the barriers to access information and the place of residence of cancer patients. This is contrary to the results of this study; however, it has been carried out on a different group.

Finally, one of the main limitations of this study is that, this study was conducted only in Northwest Health Centers of Tehran, The nature of our sample makes it difficult to generalize results to other health centers and can be generalized only to first-time mothers and first-time pregnant women in Northwest Health Centers of Tehran.

Conclusion

The study showed that the most important information needs of first-time mothers and first-time pregnant women were "Fetal/newborn health." The main source of information they commonly used was "gynecologist"; the most important way of accessing resources was “visiting a doctor in person"; and the most important barrier to access information was "high costs of visiting a doctor, midwife, or nurse." Testing the hypotheses also showed that there were significant differences between “information sources” used and all demographic characteristics studied; between “access to information” and participants’ education level, income, and place of residence; and between “barriers to access information” and participants’ education level, place of residence and age. Also, according to the results of the Mann-Whitney test, it was found that there was no significant difference between the components of information-seeking behavior among the two groups of first-time mothers and first-time pregnant women.

Educating and improving the health information-seeking behavior of expectant mothers, particularly first-time mothers, is important. Providing high-quality educational programs at an affordable cost in health centers can improve their health and newborns.

Identifying the information resources, the first-time mothers need, improving their access to information, and removing the barriers they encounter can ensure providing high-quality information services and appropriate health care services.

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The Ethics Committee of Iran University of Medical Sciences approved the study (IR.IUMS.REC.1395. 9221504205).

Conflicts of Interest

There are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Author contribution

S.P., F.M. and SH.S. Contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

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