ΠΑΝΕΠΙΣΤΗΜΙΟ ΔΥΤΙΚΗΣ ΑΤΤΙΚΗΣ

ΣΧΟΛΗ ΕΠΙΣΤΗΜΩΝ ΥΓΕΙΑΣ ΚΑΙ ΠΡΟΝΟΙΑΣ

ΤΜΗΜΑ ΜΑΙΕΥΤΙΚΗΣ

ΠΜΣ ΠΡΟΗΓΜΕΝΗ ΚΑΙ ΤΕΚΜΗΡΙΩΜΕΝΗ ΜΑΙΕΥΤΙΚΗ ΦΡΟΝΤΙΔΑ

Διπλωματική Εργασία

<<Στάσεις, γνώσεις και αντιλήψεις των μαιών για το κάπνισμα (πρωτογενές, δευτερογενές και τριτογενές) στην εγκυμοσύνη και τη λοχεία και τις νεότερες πρακτικές διακοπής του καπνίσματος>>.

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UNIVERSITY OF WEST ATTICA
SCHOOL OF HEALTH AND
CARE SCIENCES
DEPARTMENT OF MIDWIFERY
MSc in ADVANCED AND EVIDENCE BASED MIDWIFERY CARE

Diploma Thesis

<<Attitudes, Knowledge and perceptions of midwives about smoking, (firsthand, secondhand and thirdhand) in pregnancy and postpartum period and latest smoking cessation practices>>.

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ΠΑΝΕΠΙΣΤΗΜΙΟ ΔΥΤΙΚΗΣ ΑΤΤΙΚΗΣ
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Μέλη Εξεταστικής Επιτροπής συμπεριλαμβανομένου και του Εισηγητή

Η διπλωματική εργασία εξετάστηκε επιτυχώς από την κάτωθι Εξεταστική Επιτροπή:

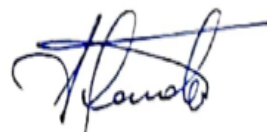| Α/α	ΟΝΟΜΑΤΕΠΩΝΥΜΟ	ΒΑΘΜΙΔΑ/ΙΔΙΟΤΗΤΑ	ΨΗΦΙΑΚΗ ΥΠΟΓΡΑΦΗ
1	Διαμάντη Αθηνά	Επίκουρη Καθηγήτρια, Τμήμα Μαιευτικής, Πανεπιστήμιο Δυτικής Αττικής	
2	Λυκερίδου Αικατερίνη	Ομότιμη Καθηγήτρια, Τμήμα Μαιευτικής, Πανεπιστήμιο Δυτικής Αττικής	
3	Σαραντάκη Αντιγόνη	Αναπληρώτρια Καθηγήτρια, Τμήμα Μαιευτικής, Πανεπιστήμιο Δυτικής Αττικής	

Η κάτωθι υπογεγραμμένη Δελακοβία Ταξιαρχούλα του Δημητρίου , με αριθμό μητρώου 20020, φοιτήτρια του Πανεπιστημίου Δυτικής Αττικής της Σχολής Επιστημών Υγείας και Πρόνοιας του Τμήματος Μαιευτικής , δηλώνω υπεύθυνα ότι:

 «Είμαι συγγραφέας αυτής της πτυχιακής/διπλωματικής εργασίας και ότι κάθε βοήθεια την οποία είχα για την προετοιμασία της είναι πλήρως αναγνωρισμένη και αναφέρεται στην εργασία. Επίσης, οι όποιες πηγές από τις οποίες έκανα χρήση δεδομένων, ιδεών ή λέξεων, είτε ακριβώς είτε παραφρασμένες, αναφέρονται στο σύνολό τους, με πλήρη αναφορά στους συγγραφείς, τον εκδοτικό οίκο ή το περιοδικό, συμπεριλαμβανομένων και των πηγών που ενδεχομένως χρησιμοποιήθηκαν από το διαδίκτυο. Επίσης, βεβαιώνω ότι αυτή η εργασία έχει συγγραφεί από μένα αποκλειστικά και αποτελεί προϊόν πνευματικής ιδιοκτησίας τόσο δικής μου, όσο και του Ιδρύματος.

Παράβαση της ανωτέρω ακαδημαϊκής μου ευθύνης αποτελεί ουσιώδη λόγο για την ανάκληση του πτυχίου μου».

Επιθυμώ την απαγόρευση πρόσβασης στο πλήρες κείμενο της εργασίας μου μέχρι 3/06/2024 και έπειτα από αίτηση μου στη Βιβλιοθήκη και έγκριση του επιβλέποντα καθηγητή

Ο/Η Δηλών/ούσα

* Ονοματεπώνυμο /Ιδιότητα
        (Υπογραφή)

Ψηφιακή Υπογραφή Επιβλέποντα

* Σε εξαιρετικές περιπτώσεις και μετά από αιτιολόγηση και έγκριση του επιβλέποντα, προβλέπεται χρονικός περιορισμός πρόσβασης (embargo) 6-12 μήνες. Στην περίπτωση αυτή θα πρέπει να υπογράψει ψηφιακά ο/η επιβλέπων/ουσα καθηγητής/τρια, για να γνωστοποιεί ότι είναι ενημερωμένος/η και συναινεί. Οι λόγοι χρονικού αποκλεισμού πρόσβασης περιγράφονται αναλυτικά στις πολιτικές του Ι.Α. (σελ. 6):

https://www.uniwa.gr/wp-content/uploads/2021/01/%CE%A0%CE%BF%CE%BB%CE%B9%CF%84%CE%B9%CE%BA%CE%B5%CC%81%CF%82_%CE%99%CE%B4%CF%81%CF%85%CE%BC%CE%B1%CF%84%CE%B9%CE%BA%CE%BF%CF%85%CC%81_%CE%91%CF%80%CE%BF%CE%B8%CE%B5%CF%84%CE%B7%CF%81%CE%B9%CC%81%CE%BF%CF%85_final.pdf).

Περίληψη

Εισαγωγή: Το κάπνισμα κατά τη διάρκεια της εγκυμοσύνης παραμένει ένα σημαντικό πρόβλημα της δημόσιας υγείας παγκοσμίως, με σημαντικούς κινδύνους για την υγεία της μητέρας και του εμβρύου. Στην Ελλάδα, όπου τα ποσοστά καπνίσματος είναι υψηλά, πρόσφατες έρευνες αναδεικνύουν το επίμονο κάπνισμα κατά τη διάρκεια της εγκυμοσύνης ως σοβαρό ζήτημα. Οι μαίες, αναπόσπαστο μέρος της περιγεννητικής φροντίδας, επηρεάζουν τις προσπάθειες διακοπής του καπνίσματος μέσω της στάσης και των γνώσεών τους. Η κατανόηση των αντιλήψεων τους σχετικά με τις αναδυόμενες στρατηγικές διακοπής καπνίσματος, είναι ζωτικής σημασίας για τη βελτίωση των αποτελεσμάτων.

Μεθοδολογία: Αυτή η μελέτη διενεργήθηκε μεταξύ Ελληνίδων μαιών ώστε να διερευνήσει τις στάσεις, τις γνώσεις και τις αντιλήψεις τους σχετικά με το κάπνισμα στην εγκυμοσύνη. Η έρευνα, που διεξήχθη από τον Δεκέμβριο του 2022 έως τον Δεκέμβριο του 2023, χρησιμοποίησε ένα διαδικτυακό ερωτηματολόγιο μεταξύ μαιών σε κέντρα υγείας, νοσοκομεία και ιδιωτικά ιατρεία.

Αποτελέσματα: Εκατόν πενήντα μαίες ανταποκρίθηκαν πλήρως (88,2%). Οι συμμετέχοντες ήταν κυρίως γυναίκες (97,3%), Έλληνες υπήκοοι (98,7%) και έγγαμες (61,3%). Οι περισσότεροι κατείχαν πτυχίο πανεπιστημίου (54,4%), ενώ ορισμένοι είχαν επίσης μεταπτυχιακές σπουδές (36,9%). Ένα σημαντικό ποσοστό (22%) είχε λάβει εκπαίδευση διακοπής του καπνίσματος, ενώ το 77,3% επιθυμούσε τέτοια εκπαίδευση. Όσες εκπαιδεύτηκαν παρουσίασαν υψηλότερες βαθμολογίες γνώσεων σχετικά με τις επιπτώσεις του καπνίσματος κατά τη διάρκεια της εγκυμοσύνης. Υπήρξε θετική συσχέτιση μεταξύ της γνώσης και των ισχυρότερων απόψεων σχετικά με τις βλάβες του καπνίσματος, οδηγώντας σε περισσότερες πρακτικές διακοπής καπνίσματος και αναγνώρισης του ρόλου των μαιών. Οι αντιλήψεις για τη συμβολή των μαιών στη διακοπή του καπνίσματος συσχετίστηκαν με αυξημένες πρακτικές προς αυτή την κατεύθυνση. Οι καπνίστριες έτειναν να υποτιμούν τους κινδύνους του καπνίσματος κατά τη διάρκεια της εγκυμοσύνης. Η εκπαίδευση και η οικογενειακή κατάσταση επηρέασαν τις αντιλήψεις για τη συμβολή των μαιών στη διακοπή του καπνίσματος. Οι μεγαλύτερης ηλικίας μαίες έδιναν μεγαλύτερη σημασία στην ενημέρωση και την παροχή βοήθειας στις έγκυες γυναίκες ώστε να διακόψουν το κάπνισμα.

Αποτελέσματα: Αυτά τα ευρήματα υπογραμμίζουν τον καίριο ρόλο της εκπαίδευσης και των αντιλήψεων των μαιών στην προσέγγιση διακοπής του καπνίσματος κατά τη διάρκεια της εγκυμοσύνης.

Λέξεις-κλειδιά: εγκυμοσύνη; διακοπή καπνίσματος; μαίες; εμβρυϊκή υγεία. περιγεννητική φροντίδα; εκπαίδευση

Abstract

Introduction: Smoking during pregnancy remains a significant global public health concern, with substantial risks to maternal and fetal health. In Greece, where smoking rates are high, recent surveys highlight persistent smoking during pregnancy as a serious issue. Midwives, integral to perinatal care, influence smoking cessation efforts through their attitudes and knowledge. Understanding their perspectives on emerging cessation strategies is crucial for improving outcomes.

Methods: This study surveyed Greek midwives to explore their attitudes, knowledge, and perceptions regarding smoking in pregnancy. Conducted from December 2022 to December 2023, the survey utilized an online questionnaire among midwives in health centers, hospitals, and private practices.

Results: One-hundred and fifty midwives provided full responses (88.2%). Participants were predominantly female (97.3%), Greek nationals (98.7%), and married (61.3%). Most held bachelor's degrees (54.4%), with some also having master's degrees (36.9%). A significant proportion (22%) had received smoking cessation training, while 77.3% desired such education. Those who were educated exhibited higher knowledge scores on smoking's effects during pregnancy. Knowledge positively correlated with stronger opinions on smoking's harms, leading to more cessation practices and recognition of midwives' role. Perceptions of midwives' importance in cessation were associated with increased cessation practices. Smokers tended to underestimate smoking's risks during pregnancy. Education and marital status influenced perceptions of midwives' contribution to cessation. Older

midwives perceived greater importance in informing and assisting pregnant women to quit smoking.

Conclusions: These findings underscore the pivotal role of education and perceptions in midwives' approach to smoking cessation during pregnancy.

Keywords: pregnancy; smoking cessation; midwives; fetal health; perinatal care; education

Introduction

Smoking during pregnancy continues to pose a significant global public health challenge, presenting substantial risks to the health of both mothers and fetuses. Throughout the perinatal period, exposure to firsthand, secondhand, and thirdhand tobacco smoke stands out as the most significant preventable contributor to numerous adverse pregnancy outcomes[1,2].

In Greece, smoking is notably prevalent among the population, with data from the 2020 Eurobarometer indicating a tobacco and related products usage rate of 42%[3]. Recent surveys conducted within Greece underscore the persistent nature of smoking during pregnancy as a serious public health issue[4,5]. One survey revealed that at the onset of pregnancy, 46.73% of expectant mothers identified themselves as smokers, with 17.55% continuing to smoke throughout their pregnancies[4]. Another recent study found that 41.4% of participating pregnant women reported smoking, while the overall prevalence of smoking at the conclusion of pregnancy stood at 19.7%[5].

 Given their constant interaction with pregnant women during both the prenatal and postpartum periods, midwives play a direct role in supporting smoking cessation effort[6]. Midwives play a pivotal role in supporting women through pregnancy and childbirth, advocating for healthy behaviors, and providing essential guidance on smoking cessation. As frontline healthcare professionals, their attitudes, knowledge, and perceptions regarding smoking in pregnancy profoundly influence the care provided to expectant mothers. Moreover, with the evolution of smoking cessation practices, understanding midwives' perspectives on newer strategies becomes imperative for improving maternal and neonatal outcomes[7].

In recent years, the landscape of smoking cessation has witnessed the emergence of innovative strategies leveraging technology and behavioral science. From mobile health applications to virtual counseling platforms, these novel approaches offer promising avenues for enhancing engagement and adherence to smoking cessation interventions among pregnant women[8]. Midwives' awareness of these advancements and their willingness to adopt them into practice are critical for addressing the evolving needs of expectant mothers and improving smoking cessation outcomes in pregnancy.

Primary prevention strategies focus on averting smoking initiation among women of childbearing age, thereby mitigating the risks associated with smoking during pregnancy. Secondary prevention involves early detection and intervention for pregnant women who smoke, aiming to minimize the adverse effects on maternal and fetal health. Tertiary prevention strategies focus on minimizing harm and optimizing outcomes for pregnant women who continue to smoke despite cessation support[9,10]. Midwives' perceptions of harm reduction approaches, such as nicotine replacement therapy, shape their recommendations and support strategies for women struggling to quit smoking during pregnancy[11].

In a previous study, the authors evaluated the attitudes and knowledge of midwives about smoking cessation perinatally[12]. Using a new cohort of midwives which also includes those from the previous study, this research aims to explore the attitudes, knowledge, and perceptions of midwives regarding smoking in pregnancy and childbirth in Greece, encompassing both traditional and emerging cessation practices.

Materials and Methods

Study design

We conducted a survey among Greek midwives working in health centers and hospitals in the 1st and 2nd Health Districts or at private practices from December 2022 to December 2023, using an online self-administered questionnaire.

Population studied

The sample for the collection of the data consisted of midwives working in the aforementioned health services. The inclusion criteria were: a) age > 18 years; b) agreement to participate in the study; c) sufficient knowledge of the Greek language; and d) practicing midwifery care. The exclusion criterion was a midwife's involvement in professional practices linked to smoking cessation.

Questionnaire used

We used data from the literature to create a self-administered questionnaire with 36 questions (Supplementary File 1). We divided the questionnaire into seven sections.

-Demographics of the study population (Q1 to Q7);
-Education about smoking and quitting smoking (Q8 to Q12);
-Smoking status of the participants (Q13 to Q19);
-Knowledge about smoking and smoking cessation in pregnant women (Q20 to Q33);
-Opinions about smoking and smoking cessation in pregnant women (Q34);
-Practices for smoking cessation in pregnant women (Q35);
-Perceptions about smoking and smoking cessation in pregnant women (Q36)

Data collection

We created the self-administered anonymized questionnaire using the Microsoft electronic platform. We shared the URL link to the self-administered questionnaire through social media posts, online closed groups where midwives participate, and via the researcher's personal e-mail to midwives. Participation in the survey was voluntary. At the outset of the questionnaire, a brief paragraph was provided to inform participants about the study's aims and assure them of the confidentiality of their responses. All participants gave informed consent. Data were collected anonymously.

Ethical considerations

The study protocol was approved by the Clinical Research and Ethics Committee of the 1st and 2nd Health Districts (protocol numbers 68197/15-11-2022 and 50502/23-

11-2022, respectively) and by the Research Ethics Boards of the University of West Attica (protocol number 64102/05-07-2023).

Statistical analysis

We tested the normality of the continuous-variable distributions using the Kolmogorov-Smirnov test. We used mean values and standard deviations (SD) to describe the normally distributed variables and additionally used medians and interquartile ranges for the non-normally distributed ones. We used absolute (N) and relative (%) frequencies to describe the categorical variables. We used Spearman's correlation coefficient (rho) to test the relationship between two continuous variables. We investigated the structure of opinions about the effects of smoking during pregnancy, cessation practices, and perceptions about them using "exploratory factor analysis" (Rotation Method: Varimax). We used the Kaiser-Meyer-Olkin (KMO) criterion and Bartlett's test to assess the appropriateness of the sample. We tested the internal reliability of the questionnaire using the Cronbach's coefficient. Linear regression analysis was used to find independent factors associated with participants' knowledge of the effects of smoking on pregnancy, views on the effects of smoking on pregnancy, cessation practices, and perceptions about them, from which dependence coefficients (b) and their standard errors (standard errors =SE) were derived. We used the logarithm of the dependent variable in the linear regression when its distribution was not normal. We used two-sided significance levels and set the statistical significance at 0.05. We used the statistical program SPSS 26.0 for the analysis.

Results

A total of 150 midwives fully responded to the questionnaire (88.2%).

Demographics

The sample consisted of 150 midwives with a mean age of 39.9±10.3 years. 97.3% of participants were females. 98.7% were of Greek nationality, and 61.3% were married. In addition, the majority of the participants (54.4%) had a bachelor's degree, while 36.9% also had a master's degree. The median length of service was 17 years (range: 7–23 years), and finally, 47.3% worked in primary health care.

Demographic characteristics of the study population are displayed in Table 1 (Supplementary file 2)

Education of the participants in smoking cessation

While 22% of participants had received some smoking cessation training, 77.3% expressed a desire for further education. Most participants (76.7%) considered that the best form of providing specific education is the conduct of special seminars (e.g., for lifelong learning). In addition, most participants (70%) would like the purpose of the education to be an understanding of the risks for both the pregnant woman and the fetus and their later lives due to their exposure to cigarette smoke. Furthermore, regarding smoking cessation education, 48% of the participants found education at the undergraduate level very to extremely useful, 45.3% found education at the postgraduate level very to extremely useful, and 68.6% mentioned that receiving training in smoking cessation techniques is very to extremely useful in daily clinical practice so they could help pregnant and lying-in women smokers to quit smoking.

Table 2 (Supplementary file 2) displays data about the participants' smoking cessation education.

The smoking status of the participants

55.3% of participants were never smokers, 19.3% smoked daily, 13.3% used to smoke but no longer smoked, and 12% smoked occasionally. Among smokers, the median

number of cigarettes per day was 9 (range: 3–17), and the corresponding duration of smoking was 19 years (range: 10–25). The median age of smoking initiation was 20 years (range: 18–22). In addition, 38.3% of smokers had their first cigarette one hour after waking up, and the majority of them (57.4%) used conventional cigarettes. Finally, the same percentage stated that they had tried to quit smoking in the past. Table 3 (Supplementary file 2) displays the participants' smoking status data.

Knowledge about smoking and smoking cessation in pregnancy

 Regarding the conditions for which smoking is a risk factor, 86.7% of the participants chose premature birth, 65.3% placental detachment, 63.3% childhood asthma, and 60.0% spontaneous. Moreover, 96.7% of the participants answered correctly that when quitting smoking, there can be withdrawal symptoms such as headache, dizziness, weakness, anxiety, and difficulty concentrating; 84.7% answered that smoking can cause damage to the fetus regardless of the number of cigarettes; and 88% said that nicotine can be just as addictive as heroin as a mood and behavior change agent. Also, 64% answered correctly that the safety limit for cigarette consumption during pregnancy is zero, and 90.7% said that the use of new tobacco products [electronic nicotine delivery systems (ENDS), e-cigarettes, IQOS, etc.] is also not allowed during pregnancy. Furthermore, 78% accurately concurred that the fetus's blood contains higher levels of nicotine and carbon monoxide than the pregnant women, and 28% agreed that the use of nicotine replacement therapy during pregnancy is permissible.

Only 24% of participants knew the term motivational interviewing; even less, 9.3% knew the '5As' and '5Rs' models as a smoking cessation intervention, while 78% were familiar with IQOS and ENDS products. Also, 96% would not recommend the use of other tobacco products during pregnancy (e.g., electronic cigarettes, heated tobacco) instead of conventional cigarettes, and 31.3% were aware of smoking cessation services that can refer pregnant smokers.

Table 4 (Supplementary file 2) summarizes the knowledge about smoking and smoking cessation in pregnancy.

A score about the knowledge of effects of smoking during pregnancy was then calculated. The score ranged from 0 to 100 points, and a higher score indicated better knowledge of the effects of smoking during pregnancy.

In the specific sample the minimum value of the score was 17.7 points and the maximum was 100. The mean value was 60.2 points (SD=18.5 points) and the median value was 58.8 points (interquartile range=47.1 – 70.6 points).

Opinions

We observed that 35.3% of the participants thought that third-hand smoke exposure affects the pregnant woman and the fetus very to extremely, and 50% thought that this exposure affects the newborn and the child. In addition, 73.3% consider that it contributes very much to extremely to the failure to quit smoking if the woman's partner smokes, and 76.6% if the woman's partner makes an effort to quit smoking at the same time. 66.6% believe that smoking significantly affects a smoker's milk, and 33.4% believe that smoking during breastfeeding is harmful, making it preferable not to breastfeed. Table 5 (Supplementary file 2) displays the participants' opinions regarding smoking during pregnancy.

The questions about the participants' opinions on smoking during pregnancy were grouped into one factor, after exploratory factor analysis with Varimax rotation. The factor is described in the Table 6 (Supplementary file 2).

The KMO criterion value was 0.58, which was above the acceptable limit (0.5), so there was sample adequacy, and it was suitable for factor analysis. Also, Bartlett's test was significant (p<0.001), so there was a significant correlation between the questions, supporting the suitability of the data for factor analysis.

A score for ''Participants' opinions on smoking during pregnancy'' was then calculated as an average of the relevant questions.

This score ranges from 0 to 4 points, with 0 representing 'Not at all' and 4 representing 'Extremely'. Thus, a higher score implies greater agreement with opinions on the aggravating effect of smoking during pregnancy.

In this particular sample the score ranged from 0.8 to 4.0 points with a mean value of 2.7 points (SD=0.7 points) and median value of 2.6 points (interquartile range 2.2-3.2 points).

Cronbach's α reliability coefficient was 0.75, greater than 0.7, indicating acceptable reliability.

Practices

Eighty-four percent of the participants asked pregnant women often to very often if they smoke; 70% determined their smoking profile at the same frequency; 87.4% asked how much they smoke; and 70% asked if they use other tobacco products such as e-cigarettes, etc. Also, 49.3% asked often or very often if there are smokers in the family, and 53% said the smoking cessation effort also includes smokers in the immediate environment. Eighty-two percent of the participants frequently explained the dangers of smoking; 92% advised smoking cessation, and indeed, 82.6% recommended the immediate effort to do so, while 85.3% recommended reducing smoking. Finally, 57.4% of the midwives asked the pregnant women if they were ready to quit, and 39.6% referred them to smoking cessation services.

Practices of the participants regarding smoking cessation during pregnancy are summarized in Table 7 (Supplementary file 2).

Questions about participants' smoking cessation practices during pregnancy were grouped into one factor, following exploratory factor analysis with Varimax rotation. The factor is described in the Table 8 (Supplementary file 2).

The KMO criterion value was 0.89, which was above the acceptable limit (0.5), so the sample was adequate and suitable for factor analysis. Also, Bartlett's test was significant ($p < 0.001$), so there was a significant correlation between the questions, supporting the suitability of the data for factor analysis.

A score for "Smoking Cessation Practices" was then calculated as an average of the relevant questions.

This score ranges from 0 to 4 points, with 0 representing 'Never' and 4 'Very often'. Thus, a higher score implies implementing more smoking cessation practices during pregnancy.

In this particular sample the score ranged from 0.0 to 4.0 points with a mean value of 3 points (SD=0.8 points) and a median value of 3.2 points (interquartile range 2.5-3.6 points).

Cronbach's α reliability coefficient was 0.9, greater than 0.7, indicating acceptable reliability.

Perceptions

Only 8.6% of participants believed that pregnant women are very to extremely well informed about the risks of firsthand, secondhand, and thirdhand exposure to tobacco smoke; 14% believed that smoking cessation counseling can affect their relationship with the pregnant woman; and 11.3% believed that smoking can help the pregnant woman manage her stress during pregnancy. Twenty percent of the participants agreed very strongly that women with mental illness are better off not quitting smoking than experiencing withdrawal symptoms due to their physical dependence on cigarette smoke; 71.3% said that midwives play an important role in informing pregnant smokers about smoking cessation; and 72.7% said similarly in informing lying-in women. In addition, 64% considered that smoking cessation is part of midwifery care, while 42.6% did not consider the training of midwives in this regard to be sufficient. Sixty-eight percent believed they should be trained at the undergraduate level; 88% believed that if there were smoking cessation clinics in maternity wards and maternity clinics, it would be easier to recommend them to pregnant smokers, and pregnant women would visit and trust them more easily, according to 77.4%. The largest percentage, 90.7%, considers the partner's involvement in smoking cessation very important, while only 32.7% feel very to extremely able to support pregnant or lying-in women in smoking cessation, only 50% have great confidence to talk about the risks, and 53.3% suggest quitting it. The perceptions of the participants regarding smoking cessation during pregnancy are illustrated in Table 9 (Supplementary file 2).

Questions about participants' perceptions of smoking cessation during pregnancy were grouped into two factors, ''Midwives' contribution to smoking cessation during pregnancy'' and ''Information and help to quit smoking during pregnancy'' after exploratory factor analysis with Varimax rotation. The factor is described in the Table 10 (Supplementary file 2).

The KMO criterion value was 0.78, which was above the acceptable limit (0.5), so there was sample adequacy, and it was suitable for factor analysis. Also, Bartlett's test was significant (p<0.001), so there was a significant correlation between the questions, supporting the suitability of the data for factor analysis.

The factor "Midwives' contribution to smoking cessation during pregnancy" consists of 6 questions and explains 27.7% of the variability. The factor "Information and help to stop smoking during pregnancy" consists of 9 questions and explains 16.9% of the variability.

The score for the dimensions "Midwives' contribution to smoking cessation during pregnancy" and "Information and assistance to stop smoking during pregnancy" was then calculated as an average of the relevant questions.

Table 11 (Supplementary file 2) is the table of descriptive elements for the ''Midwives' contribution to smoking cessation during pregnancy'' and ''Information and help to quit smoking during pregnancy'' scores, which range from 0 to 4 points, with 0 to represent 'Not at all' and 4 'Extremely'. Thus, a higher score implies a greater importance of midwives' contribution to smoking cessation during pregnancy and better information and assistance to quit smoking during pregnancy.

In the specific sample the score ranged from 0.3 to 4 points with a mean value of 2.8 points (SD=0.8 points) in the dimension "Midwives' contribution to smoking cessation during pregnancy" and from 1 to 4 points with a mean value of 2.4 points (SD=0.5 points) on the dimension "Information and help to quit smoking during pregnancy".

Cronbach's α reliability coefficient was greater than 0.7 for both dimensions, indicating acceptable reliability.

Association of knowledge with participants' demographic characteristics, smoking cessation education, and smoking status

To find the factors independently associated with participants' knowledge of the effects of smoking during pregnancy, multivariate linear regression was performed with knowledge score as the dependent variable and participants' demographic characteristics, smoking cessation education, and smoking status as independent variables (Table 12, Supplementary file 2).

Only education about smoking cessation was found to be independently associated with participants' knowledge scores. In particular, those who had been educated had a significantly higher score and therefore more knowledge about the effects of smoking during pregnancy (Figure 1).

Correlation of knowledge score and scores on participants' views on the harmful effects of smoking during pregnancy, smoking cessation practices, and dimensions related to informing pregnant women and midwives' contribution to smoking cessation

We found a significant and positive relationship between the knowledge score and opinions about the effects of smoking during pregnancy. More knowledge about smoking was associated with stronger opinions about the harmful effects of smoking during pregnancy. A similarly significant correlation existed between views of practices and perceptions. Stronger views on the negative effects of smoking were associated with the implementation of more cessation practices and a greater perception of the importance of midwives' contribution to cessation and information to pregnant women. Similarly, greater importance of midwives' contribution to smoking cessation and information to pregnant women was associated with more application of smoking cessation practices during pregnancy (Table 1).

Association of smoking cessation practices with participants' demographic characteristics and smoking status, their smoking cessation education, their knowledge, their opinions, and perceptions about smoking and smoking cessation in pregnancy

We performed multivariate linear regression with the practices score as the dependent variable, participants' demographic characteristics, smoking cessation education, smoking status, their knowledge of the effects on pregnancy, and their opinions and perceptions about it as independent variables to identify the factors independently associated with smoking cessation practices during pregnancy. We found an independent relationship between smoking cessation practices and variables regarding perceptions of the importance of midwives' contribution to smoking cessation during pregnancy, as well as information and assistance on this topic. In particular, a better understanding of the importance of midwives' contribution to smoking cessation during pregnancy, as well as information and assistance on this, entailed the implementation of more practices in this regard (Table 2).

Association of opinions on the effects of smoking in pregnancy with participants' demographic characteristics, smoking status and smoking cessation education.

We performed multivariate linear regression with opinion score as the dependent variable and participants' demographic characteristics, smoking cessation education, and smoking status as independent variables to identify the factors independently associated with opinions about the effects of smoking during pregnancy. We found an independent association between the participants' smoking profile and their views on the effects of smoking during pregnancy. Specifically, those who smoked had a lower score, so they considered the effects of smoking during pregnancy less harmful than those who did not smoke (Table 3, Figure 2).

Association of perceptions of smoking during pregnancy with participants' demographic characteristics, smoking status, and education about smoking cessation

To find the factors independently associated with perceptions of the effects of smoking during pregnancy, multivariate linear regression was performed with the score on the variables "Midwives' contribution to smoking cessation during pregnancy" and "Information and help on smoking cessation during pregnancy'' as the dependent variables and participants' demographic characteristics, smoking cessation education, and smoking status as independent variables.

With the dependent variable, the variable "Midwives' contribution to smoking cessation during pregnancy":

We found that perceptions of the importance of midwives' contribution to smoking cessation during pregnancy were independently associated with marital status and education about smoking cessation. More specifically, married people had a higher score, so they placed more importance on midwives' contribution to smoking cessation during pregnancy compared to single people, and those who had been trained in smoking cessation had a higher score, so they placed more importance on midwives' contribution to smoking cessation during pregnancy compared to those who had no training (Table 4).

With dependent variable the variable "Information and help to quit smoking during pregnancy":

Age was found to be independently associated with perceptions of help and information about smoking cessation during pregnancy. Specifically, older age was associated with a greater perception of the importance of informing and helping women quit smoking during pregnancy (Table 5).

Discussion

This study aimed to explore the knowledge, attitudes, and practices of midwives regarding smoking cessation during pregnancy. The findings shed light on various aspects of midwifery care related to smoking cessation interventions in Greece, highlighting both strengths and areas for improvement in current practices.

The results indicate a significant gap in formal education and training related to smoking cessation among midwives. Although a substantial proportion of participants expressed a desire for education in this area, only a minority had received formal training. This finding aligns with previous studies highlighting the lack of comprehensive training programs for healthcare professionals, including midwives, in smoking cessation interventions[7,13-15].

Midwives play a pivotal role in providing prenatal care, and their understanding of the risks of smoking during pregnancy directly influences the quality of care they provide to pregnant women. Studies have shown that midwives with higher levels of knowledge about the effects of smoking during pregnancy are more likely to engage in smoking cessation practices and provide effective counseling to pregnant women[16-18]. Therefore, efforts to enhance midwives' education and training in smoking cessation interventions are essential to improve patient outcomes and reduce the prevalence of smoking during pregnancy.

The prevalence of smoking among midwives in this study was relatively low, with the majority being non-smokers. However, a notable proportion had previously smoked, indicating personal experience with tobacco use that could potentially inform their counseling approaches. It is encouraging to note that most midwives frequently inquire about smoking status and provide counseling to pregnant women[19]. These findings suggest a commitment to addressing smoking cessation within the scope of midwifery practice.

Previous research has demonstrated the positive impact of midwives' engagement in smoking cessation practices on smoking behavior among pregnant women[20-22]. Research has shown that midwives' advice and support can increase quit rates and reduce smoking relapse during pregnancy[23-25]. Therefore, this study commends the proactive approach among midwives and emphasizes the importance of integrating smoking cessation interventions into routine prenatal care.

The attitudes and perceptions of midwives play a crucial role in shaping their approach to smoking cessation interventions. While the majority of midwives recognized the harmful effects of smoking during pregnancy, there were some misconceptions and gaps in knowledge, particularly regarding third-hand smoke exposure and the use of alternative tobacco products. These findings underscore the necessity of continuous education and training to dispel misconceptions and equip

midwives with precise and current knowledge on tobacco-related risks resulting not only from active smoking but also from second- and third-hand smoking[26].

Furthermore, the perception of midwives regarding their role in smoking cessation varied, with some expressing confidence in their ability to support pregnant women in quitting smoking, while others felt less capable. This discrepancy underscores the importance of addressing self-efficacy and providing midwives with the necessary skills and resources to deliver effective smoking cessation interventions[27,28].

Our results also revealed a significant association between education about smoking cessation and participants' knowledge scores. Midwives who had received formal training in smoking cessation exhibited higher knowledge levels regarding the effects of smoking during pregnancy. This finding underscores the importance of targeted educational programs in equipping midwives with the necessary knowledge to address smoking-related issues effectively. In addition, we observed a positive correlation between midwives' knowledge scores and their attitudes towards smoking cessation during pregnancy. Participants with greater knowledge about smoking-related risks were more likely to hold stronger opinions about the harmful effects of smoking and the importance of smoking cessation interventions. This suggests that increasing midwives' knowledge may lead to more proactive attitudes and advocacy for smoking cessation among pregnant women. These findings are consistent with previous research indicating a direct relationship between midwives' knowledge levels and their attitudes towards smoking cessation[29,30].

The study also examined the factors influencing midwives' implementation of smoking cessation practices during prenatal care and possible facilitators. The study identified perceptions of midwives' contribution to smoking cessation and the availability of information and assistance on cessation as independent predictors of the implementation of cessation practices. Midwives who recognized the significance of their role in supporting smoking cessation efforts and had access to resources and guidance on cessation interventions were more likely to engage in cessation practices.

Midwives often have limited time during prenatal appointments to address smoking cessation adequately. Midwives may encounter challenges in addressing smoking cessation due to competing priorities during prenatal visits, such as monitoring fetal health, discussing birth plans, or addressing other health concerns. However, building trusting relationships, providing non-judgmental support, offering tailored counseling, providing access to resources and referrals, and collaborating with interdisciplinary

teams have all been mentioned as facilitators for providing smoking cessation advice during pregnancy[7,14,21,31,32].

We found that perceptions of the importance of midwives' contribution to smoking cessation during pregnancy were independently associated with participants' demographic characteristics, smoking status, and education about smoking cessation. Married individuals and those who had received training in smoking cessation placed greater importance on midwives' role in cessation efforts. Additionally, older age was associated with a greater perception of the importance of informing and helping women quit smoking during pregnancy. These findings emphasize the need for tailored approaches to smoking cessation education and training, taking into account individual characteristics and demographics.

This research offers valuable perspectives on the understanding, beliefs, and actions of midwives concerning smoking cessation in pregnant women. The use of a structured questionnaire allowed for comprehensive data collection, enabling a detailed analysis of various factors influencing midwifery care in this context. Nevertheless, it is important to acknowledge several limitations of the study. Firstly, the study was conducted only in Attica, posing geographical restrictions on the final conclusions. Also, the results were obtained from different databases and patients' records from several midwives, not from a centralized electronic health database.

In addition, the reliance on self-reported data may introduce biases such as social desirability bias and recall errors. Moreover, the relatively small sample size restricts the general izability of the findings to the wider population of midwives. Another limitation is that the study did not validate the current questionnaire as a tool. Thus, future research endeavors should endeavor to validate these results using larger and more diverse samples to ensure the reliability and applicability of the conclusions.

Conclusions

In conclusion, this study provides valuable insights into the associations between midwives' demographic characteristics, smoking cessation education, knowledge, attitudes, and practices related to smoking cessation during pregnancy. By addressing gaps in education, fostering positive attitudes, and providing support for cessation interventions, healthcare organizations and policymakers can empower midwives to

play a more proactive role in promoting smoking cessation among pregnant women. Ultimately, this can contribute to improving maternal and fetal health outcomes and reducing the prevalence of smoking during pregnancy.

Ethical approval and consent to participate

The study protocol was approved by the Clinical Research and Ethics Committee of the 1st and 2nd Health Districts (protocol numbers 68197/15-11-2022 and 50502/23-11-2022, respectively) and by the Research Ethics Boards of the University of West Attica (protocol number 64102/05-07-2023). Participants provided informed consent.

Data availability

The data supporting this research are available from the authors on reasonable request.

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Table 1. **Correlations of the knowledge, opinion, practice, and perception scores about smoking and smoking cessation during pregnancy.**

		Opinions regarding smoking during pregnancy	Smoking cessation practices during pregnancy	Midwives' contribution to smoking cessation during pregnancy	Information and help to quit smoking during pregnancy
Knowledge score	rho	0.25	0.13	0.06	0.08
	P	**0.002**	0.115	0.496	0.312
Opinions regarding smoking during pregnancy	rho		0.26	0.24	0.30
	P		**0.002**	**0.003**	**<0.001**
Smoking cessation practices during pregnancy	rho			0.53	0.25
	P			**<0.001**	**0.002**

Table 2. Multivariate linear regression with the practices score as the dependent variable and participants' demographic characteristics, smoking cessation education, smoking status, their knowledge of the effects on pregnancy, and their opinions and perceptions about it as independent variables.

Variable	β+	SE++	b*	P
Gender (Females vs. males)	0.005	0.043	0.008	0.906
Age	0.002	0.002	0.219	0,.322
Married (Yes vs. No)	0.007	0.017	0.036	0.675
Level of Education (Master's degree/Doctorate vs. Bachelor's degree/School of midwives)	0.006	0.014	0.031	0.662
Work experience in the field of health in years	0.000	0.002	0.017	0.937

Work setting				
Primary health care vs. Private practice	-0.005	0.022	-0.024	0.829
Secondary health care vs. Private practice	-0.023	0.025	-0.086	0.368
Tertiary health care vs. Private practice	0.024	0.024	0.097	0.311
Do you have some education about smoking and quitting smoking (Yes vs. No)	0.024	0.018	0.101	0.194
Smoking (Yes vs. No)	-0.023	0.016	-0.107	0.146
Knowledge score	0.001	0.001	0.005	0.950
Opinions of the participants about smoking during pregnancy	0.003	0.012	0.019	0.811
Midwives' contribution to smoking cessation during pregnancy	0.052	0.009	0.434	**<0.001**
Information and help to quit smoking during pregnancy	0.028	0.016	0.133	**0.047**

+dependence coefficient ++standard error *standard coefficient; note: The logarithm of the dependent has been used.

Table 3. Multivariate linear regression with opinion score as the dependent variable and participants' demographic characteristics, smoking cessation education, and smoking status as independent variables.

Variable	β+	SE++	b*	P
Gender (Females vs. males)	-0.037	0.062	-0.050	0.552
Age	-0.002	0.003	-0.150	0.560
Married (Yes vs. No)	0.038	0.025	0.152	0.128
Level of Education (Master's degree/Doctorate vs. Bachelor's degree/School of midwives)	0.018	0.021	0.074	0.384
Work experience in the field of health in years	0.001	0.003	0.103	0.685
Work setting				
Primary health care vs. Private practice	-0.043	0.031	-0.180	0.169

Secondary health care vs. Private practice	-0.047	0.036	-0.146	0.198
Tertiary health care vs. Private practice	-0.011	0.034	-0.035	0.752
Do you have some education about smoking and quitting smoking (Yes vs. No)	0.019	0.024	0.065	0.442
Smoking (Yes vs. No)	-0.048	0.022	-0.186	**0.027**

+dependence coefficient ++standard error *standard coefficient; note: The logarithm of the dependent has been used.

Table 4. Multivariate linear regression with the score on the variable "Midwives' contribution to smoking cessation during pregnancy" as the dependent variable and participants' demographic characteristics, smoking cessation education and smoking status as independent variables.

Variable	β+	SE++	b*	P
Gender (Females vs. males)	0.076	0.087	0.072	0.387
Age	-0.003	0.004	-0.179	0.483
Married (Yes vs. No)	0.071	0.035	0.202	**0.043**
Level of Education (Master's degree/Doctorate vs. Bachelor's degree/School of midwives)	0.025	0.029	0.073	0.385
Work experience in the field of health in years	0.004	0.004	0.216	0.392
Work setting				
Primary health care vs. Private practice	-0.031	0.044	-0.091	0.483
Secondary health care vs. Private practice	-0.056	0.051	-0.123	0.270
Tertiary health care vs. Private practice	-0.070	0.047	-0.162	0.145
Do you have some education about smoking and quitting smoking (Yes vs. No)	0.073	0.034	0.177	**0.036**
Smoking (Yes vs. No)	-0.031	0.030	-0.083	0.314

+dependence coefficient ++standard error *standard coefficient; note: The logarithm of the dependent has been used.

Table 5. Multivariate linear regression with the score on the variable "Information and help to quit smoking during pregnancy" as the dependent variable and participants' demographic characteristics, smoking cessation education and smoking status as independent variables.

Variable	β+	SE++	b*	P
Gender (Females vs. males)	-0.192	0.248	-0.066	0.441
Age	0.020	0.012	0.433	**0.048**
Married (Yes vs. No)	0.005	0.098	0.005	0.959
Level of Education (Master's degree/Doctorate vs. Bachelor's degree/School of midwives)	0.068	0.082	0.071	0.412
Work experience in the field of health in years	-0.024	0.013	-0.493	0.057
Work setting				
Primary health care vs. Private practice	-0.132	0.125	-0.139	0.294
Secondary health care vs. Private practice	-0.105	0.144	-0.083	0.465
Tertiary health care vs. Private practice	-0.189	0.135	-0.158	0.165
Do you have some education about smoking and quitting smoking (Yes vs. No)	0.073	0.097	0.064	0.452
Smoking (Yes vs. No)	0.118	0.086	0.115	0.174

+dependence coefficient ++standard error *standard coefficient

Figure 1. Participants' knowledge score in relation to education about smoking cessation.
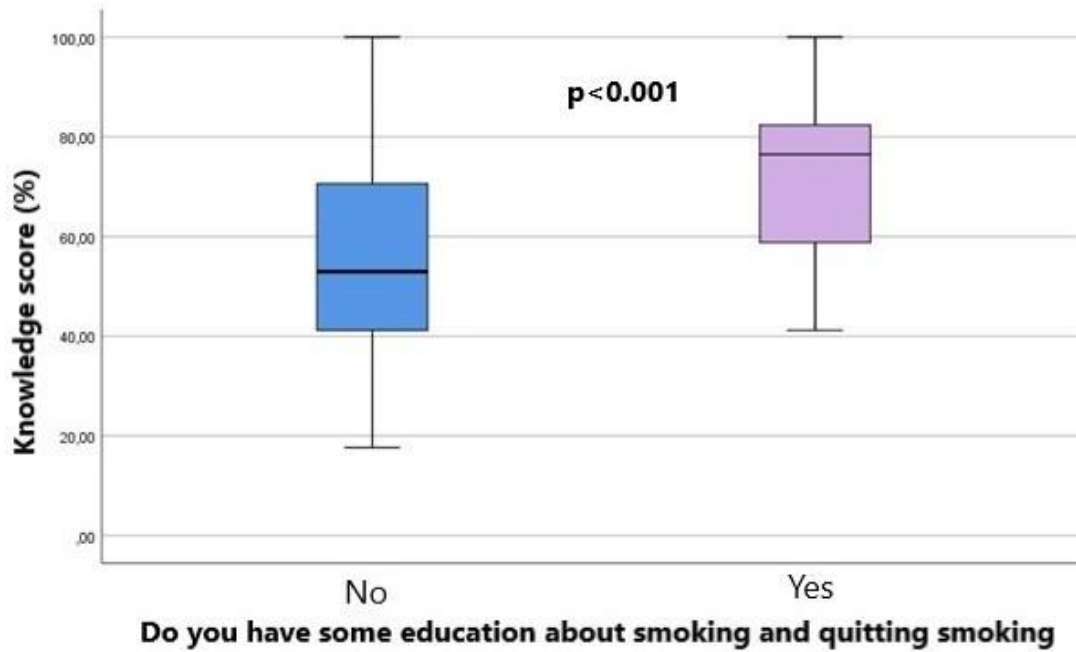
Figure 2. Score for opinions on the effects of smoking in pregnancy in relation to smoking status.
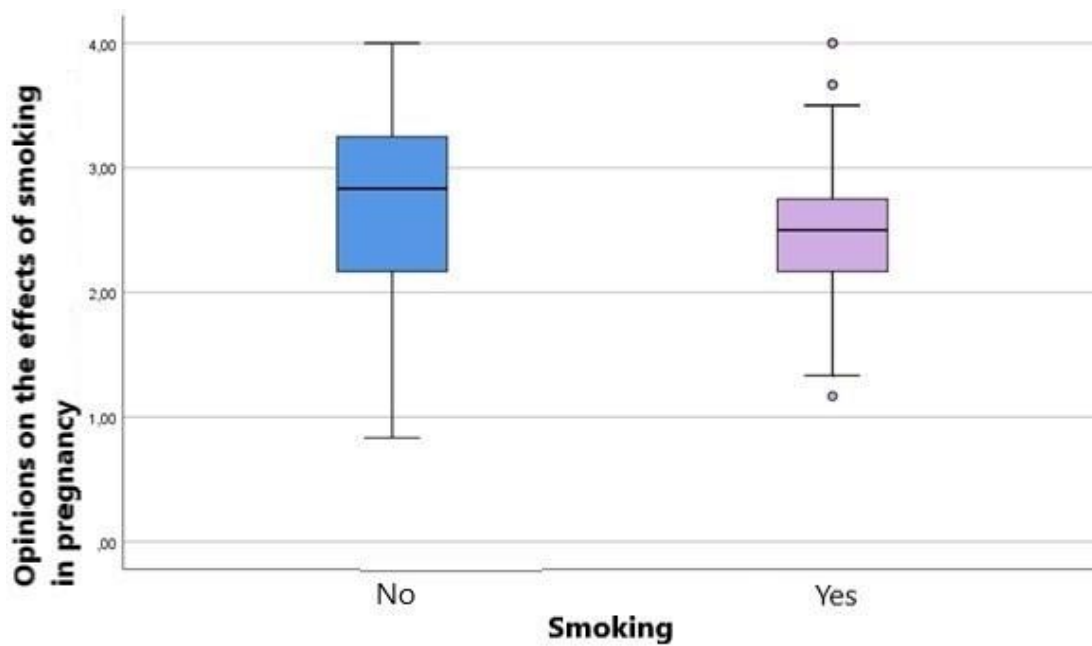
Supplementary file 2

Table 1. Demographic characteristics of the study population

Variable		N	%
Gender	Male	4	2.7
	Female	146	97.3
Age (years), Mean value (standard deviation), Median (interquartile range)		39.9 (10.3)	40(30 – 47)
Nationality	Greek	148	98.7
	Albanian	2	1.3
Family status	Single	51	34
	Married	92	61.3
	Cohabitation agreement	1	0.7
	Divorced	6	4
	Widowed	0	0
Level of education	School of midwives	5	3.4
	Bachelor's degree	81	54.4
	Master's degree	55	36.9
	Doctorate	8	5.4
	Post doctorate	0	0
Work experience in the field of health in years, Mean value (standard deviation), Median (interquartile range)		16 (9.7)	17 (7 – 23)
Work setting	Primary health care	71	47.3
	Secondary health care	25	16.7
	Tertiary health care	30	20
	Private practice	24	16

Table 2. Education of the participants in smoking cessation.

Question		N	%
Do you have some education about smoking and quitting smoking?	No	117	78
	Yes	33	22
Would you like to be educated at smoking cessation?	No	34	22.7
	Yes	116	77.3
What do you consider the best type of this particular education? *(Youcanchoosemorethanoneanswer)*			
As separate and specific courses of smoking cessation in undergraduate level.		36	24
As part of existing courses in undergraduate level.		35	23.3
As separate and specific courses of smoking cessation in postgraduate level.		15	10
As special seminar (e.g. for of life learning)		115	76.7
Other		3	2
What would you like to be the purpose of the training in smoking cessation?*(You can choose more than one answer)*			
Understanding of risks such for the pregnant as well as for the fetus and its later life because of its exposure to the smoke of a cigarette		105	70
Understanding the mechanism of nicotine addiction and education at techniques for smoking cessation.		98	65.3
Understanding and training in behavior therapy, in motivation interview and at short counseling.		77	51.3
Other		2	1.3
To what extent do you consider your education in smoking cessation techniques useful in <u>undergraduate</u> level?	Not at all	6	4
	Slightly	15	10
	Moderately	57	38
	Very	36	24
	Extremely	36	24

To what extent do you consider your education in smoking cessation techniques useful in __postgraduate__ level?	Not at all	7	4.7
	Slightly	18	12
	Moderately	57	38
	Very	35	23.3
	Extremely	33	22
To what extent do you think that receiving a training in smoking cessation techniques would help you to your daily clinic exercise to be able to help pregnant and lying-in women who smoke to quitsmoking?	Not at all	1	0.7
	Slightly	9	6
	Moderately	37	24.7
	Very	35	23.3
	Extremely	68	45.3

Table 3. Smoking status of the participants.

Question		N	%
Which is your smoking status?	Never smoker	83	55.3
	Ex-smoker	20	13.3
	Smoking daily	29	19.3
	Occasional smoking	18	12
Determine the number of cigarettes you consume daily. *		10.2 (9)	9 (3 – 17)
How many years have you been smoking? *		18 (10)	19 (10 – 25)
At what age did you start smoking? *		21(6)	20 (18 – 22)
How soon after you wake up do you smoke your first cigarette? *	After 60 minutes	18	38.3
	Within 31-60 minutes	7	14,9
	Within 6-30 minutes	12	25.5
	Within the first five minutes	2	4.2
Do you use: * *(You can choose more than one answer)*			

Conventional cigarette		27	57.4
Heated tobacco		16	34
Electronic cigarette		5	10.6
Have you tried to quit smoking in the past? *	No	17	36.2
	Yes	27	57.4

*Calculated only for smokers

Table 4. Knowledge about smoking and smoking cessation in pregnancy

Question		N	%
For which of the following situations do you consider smoking in pregnancy is a risk factor? *(You can choose more than one answer)*			
1.Placenta detachment		98	65.3
2.Premature rupture of membranes		66	44
3. Premature childbirth		130	86.7
4. Spontaneous abortions		90	60
5.Asthma in childhood		95	63.3
6. Congenital anomalies such as cleft lip and lycostoma		32	21.3
7.Neurodevelopmental problems at newborns		89	59.3
8.Syndrome of suddenly death		87	58
9. Development of cancer in childhood		37	24.7
10. Obesity in childhood		17	11.3
Symptoms may occur when quitting smoking such as headache, dizziness, weakness, anxiety and difficulty in concentration.	No	5	3.3
	Yes	145	96.7
Smoking during pregnancy causes damage to the fetus independently of number of cigarettes.	No	23	15.3
	Yes	127	84.7
Nicotine is equally addictive as	No	18	12

heroin, as a factor in changing disposition and behavior.	Yes	132	88
What is the safe limit for cigarette consumption in pregnancy?	0 cigarettes	96	64
	1-3 cigarettes	48	32
	3-5 cigarettes	5	3,3
	Other	1	0.7
The use of new tobacco products (ENDS, e-cigarette, IQOS, etc.) is allowed during pregnancy.	No	136	90.7
	Yes	14	9.3
Nicotine and carbon monoxide penetrate the placental barrier and are detected in the blood of the fetus at higher levels compared to the pregnant.	No	33	22
	Yes	117	78
When quitting smoking during pregnancy, is it allowed to use nicotine replacement products?	No	108	72
	Yes	42	28
Do you know the term "motivational interviewing"?	No	114	76
	Yes	36	24
Do you know models"5As" and "5Rs"as an intervention for smoking cessation?	No	136	90.7
	Yes	14	9.3
Do you know what is the IQOS and the ENDS products?	No	33	22
	Yes	117	78

Would you recommend the use others of tobacco products (e.g. electronic cigarette, heated tobacco) instead of conventional cigarette during pregnancy?	No	144	96
	Yes	6	4
If you answered yes to the previous question, which would you recommend? And why?	E-cigarette	2	1.4
	IQOS due to reduced amount of nicotine	1	0.7
	IQOS as I also use it	1	0.7
	IQOS	1	0.7
Do you know the smoking cessation services where you can refer the pregnant smokers?	No	103	68.7
	Yes	47	31.3

*ENDS: electronic nicotine delivery systems

Table 5. Opinions of the participants regarding smoking during pregnancy.

Question		N	%	% Very-Extremely
To what extent do you consider that the	Not at all	10	6.7	35.3

thirdhand exhibition to smoke (smoke that stays in clothes, objects etc.) affects the pregnant and the fetus?	Slightly	30	20	
	Moderately	57	38	
	Very	29	19.3	
	Extremely	24	16	
To what extent do you consider that the thirdhand exhibition to smoke (smoke that stays in clothes, objects etc.) affects the newborn and the child?	Not at all	7	4.7	50
	Slightly	17	11.3	
	Moderately	51	34	
	Very	33	22	
	Extremely	42	28	
To what extent do you consider that the smoking status of the pregnant's companion contributes to the pregnant's failure to quit smoking?	Not at all	3	2	73.3
	Slightly	5	3.3	
	Moderately	32	21.3	
	Very	47	31.3	
	Extremely	63	42	
To what extent do you consider that the attempt of the pregnant's companion to quit smoking affects the pregnant's success to quit smoking?	Not at all	0	0	76.6
	Slightly	4	2.7	
	Moderately	31	20,7	
	Very	41	27.3	
	Extremely	74	49.3	
To what extent do you consider that the milk of a pregnant smoker is affected by tobacco smoke?	Not at all	2	1.3	66.6
	Slightly	13	8.7	
	Moderately	35	23.3	
	Very	38	25.3	
	Extremely	62	41.3	
To what extent do you consider that smoking is harmful during breastfeeding so that it is preferable to not breastfeed the baby?	Not at all	26	17.3	33.4
	Slightly	35	23.3	
	Moderately	39	26	
	Very	19	12.7	
	Extremely	31	20.7	

Table 6. Exploratory factor analysis with Varimax rotation for opinions of the participants regarding smoking during pregnancy

Question	Opinions of the participants regarding smoking during pregnancy
To what extent do you consider that the thirdhand exhibition to smoke (smoke that stays in clothes, object etc.) affects the pregnant and the fetus	0.822
To what extent do you consider that the thirdhand exhibition to smoke (smoke that stays in clothes, objects etc.) affects the newborn and the child	0.789
To what extent do you consider that the smoking status of the pregnant's companion contributes to the pregnant's failure to quit smoking?	0.724
To what extent do you consider that the attempt of the pregnant's companion to quit smoking affects the pregnant's success to quit smoking?	0.701
To what extent do you consider that the milk of a pregnant smoker is affected by tobacco smoke?	0.440
To what extent do you consider that smoking is harmful during breastfeeding so that it is preferable to not breastfeed the baby?	0.405

Table 7. Practices of the participants regarding smoking cessation during pregnancy.

Question		N	%	% Often-Very often
Do you ask pregnant women if they smoke?	Never	2	1.3	84
	Rarely	3	2	
	A few times	16	10.7	
	Often	31	20.7	
	Very often	98	65.3	
Do you specify the smoking status of the pregnant(e.g. if they are active smokers, if they quit smoking due to pregnancy, if they quit the last 2weeks, if they were smokers in the past, how many cigarettes do they smoke?)	Never	2	1.3	70
	Rarely	8	5.3	
	A few times	35	23.3	
	Often	41	27.3	
	Very often	64	42.7	
Do you ask the pregnant smokers how much they smoke?	Never	3	2	87.4
	Rarely	2	1.3	
	A few times	14	9.3	
	Often	34	22.7	
	Very often	97	64.7	
When taking obstetric history beyond of questions about with the conventional cigarette	Never	9	6	70
	Rarely	14	9.3	
	A few times	22	14.7	
	Often	32	21.3	

use do you ask the pregnant and lactating women if they use other tobacco products such as electronic cigarette, heated tobacco etc.?	Very often	73	48.7	
Do you ask the pregnant women If there are smokers in their family?	Never	22	14.7	49.3
	Rarely	25	16.7	
	A few times	29	19.3	
	Often	26	17.3	
	Very often	48	32	
Are you involved in efforts to quit smoking of pregnant women and smokers in her environment?	Never	13	8.7	53
	Rarely	21	14	
	A few times	35	23.3	
	Often	43	28.7	
	Very often	38	25.3	
Do you explain the dangers of smoking?	Never	3	2	82
	Rarely	3	2	
	A few times	21	14	
	Often	34	22.7	
	Very often	89	59.3	
Do you advise the pregnant smokers to quit smoking?	Never	1	0.7	92
	Rarely	3	2	
	A few times	8	5.3	
	Often	39	26	
	Very often	99	66	
Do you ask the pregnant smokers if they feel ready to quit smoking and set a date of quitting?	Never	12	8	57.4
	Rarely	26	17.3	
	A few times	26	17.3	
	Often	34	22.7	
	Very often	52	34.7	

Do you recommend to pregnant smokers that they start direct efforts for smoking cessation?	Never	4	2.7	82.6
	Rarely	4	2.7	
	A few times	18	12	
	Often	47	31.3	
	Very often	77	51.3	
Do you recommend to pregnant smokers to reduce smoking?	Never	3	2	85.3
	Rarely	4	2.7	
	A few times	15	10	
	Often	29	19.3	
	Very often	99	66	
Do you refer the pregnant smokers to smoking cessation services?	Never	24	16.1	39.6
	Rarely	34	22.8	
	A few times	32	21.5	
	Often	23	15.4	
	Very often	36	24.2	

Table 8. Factor for smoking cessation practices.

	Smoking cessation practices
Do you ask pregnant women if they smoke?	0.739
Do you specify the smoking status of the pregnant(e.g. if they are active smokers, if they quit smoking due to pregnancy, if they quit the last 2weeks, if they were smokers in the past, how many cigarettes do they smoke?)	0.659
Do you ask the pregnant smokers how much they smoke?	0.767
When taking obstetric history beyond of questions about with the conventional cigarette use do you ask the pregnant and	0.759

lactating women if they use other tobacco products such as electronic cigarette, heated tobacco etc.?	
Do you ask the pregnant women If there are smokers in their family?	0.689
Are you involved in efforts to quit smoking of pregnant women and smokers in her environment?	0.630
Do you explain the dangers of smoking?	0.718
Do you advise the pregnant smokers to quit smoking?	0.749
Do you ask the pregnant smokers if they feel ready to quit smoking and set a date of quitting?	0.688
Do you recommend to pregnant smokers that they start direct efforts for smoking cessation?	0.777
Do you recommend to pregnant smokers to reduce smoking?	0.696
Do you refer the pregnant smokers to smoking cessation services?	0.550

Table 9. Perceptions of the participants regarding smoking cessation during pregnancy.

Question		N	%	% Very-Extremely
Are pregnant women informed about the risks of firsthand, secondhand and thirdhand exposure to tobacco smoke?	Not at all	20	13.3	8.6
	Slightly	73	48.7	
	Moderately	44	29.3	
	Very	11	7.3	
	Extremely	2	1.3	
Could the counseling for	Not at all	25	16.7	14

smoking cessation affect my relationship with the pregnant/lying-in woman?	Slightly	51	34	
	Moderately	53	35.3	
	Very	14	9.3	
	Extremely	7	4.7	
Can smoking help the pregnant woman to manage her stress during pregnancy?	Not at all	37	24.7	11.3
	Slightly	56	37.3	
	Moderately	40	26.7	
	Very	14	9.3	
	Extremely	3	2	
Do you agree that pregnant women with mental illnesses are preferable to not quit smoking despite manifest withdrawal symptoms due to her physical dependence they have on the smoke of cigarettes?	Not at all	22	14.7	20
	Slightly	43	28.7	
	Moderately	55	36.7	
	Very	17	11.3	
	Extremely	13	8.7	
Midwives play an important role <u>in informing the pregnant smokers</u> about smoking cessation.	Not at all	1	0.7	71.3
	Slightly	3	2	
	Moderately	39	26	
	Very	32	21.3	
	Extremely	75	50	
Midwives play an important role in <u>informing the lying-in childbearing women smokers</u> about smoking cessation.	Not at all	1	0.7	72.7
	Slightly	9	6	
	Moderately	30	20	
	Very	31	20.7	
	Extremely	79	52.7	
Smoking cessation is a part of midwifery care.	Not at all	5	3.3	64
	Slightly	15	10	
	Moderately	34	22.7	
	Very	37	24.7	
	Extremely	59	39.3	
Midwives don't have enough education	Not at all	22	14.7	42.6

about smoking cessation.	Slightly	31	20.7	
	Moderately	33	22	
	Very	29	19.3	
	Extremely	35	23.3	
The education of of midwives about smoking cessation should be included in undergraduatelevel.	Not at all	3	2	68
	Slightly	11	7.3	
	Moderately	34	22.7	
	Very	34	22.7	
	Extremely	68	45.3	
If there were smoking cessation settings at maternity hospitals and at maternity clinics it would be more easy to commend them to pregnant smokers.	Not at all	0	0	88
	Slightly	0	0	
	Moderately	18	12	
	Very	34	22.7	
	Extremely	98	65.3	
If there were smoking cessation settings at maternity hospitals and at maternity clinics the pregnant women would visit and trust them more easily.	Not at all	0	0	77.4
	Slightly	4	2.7	
	Moderately	30	20	
	Very	52	34.7	
	Extremely	64	42.7	
How important do you think the partner's involvement in smoking cessation?	Not at all	0	0	90.7
	Slightly	0	0	
	Moderately	14	9.3	
	Very	37	24.7	
	Extremely	99	66	
How capable do you feel to support the pregnant/childbearing women in smoking cessation?	Not at all	9	6	32.7
	Slightly	43	28.7	
	Moderately	49	32.7	
	Very	22	14.7	
	Extremely	27	18	
How confident do you feel to	Not at all	3	2	50

speak up at pregnant / childbearing women for the risks of smoking?	Slightly	20	13.3	
	Moderately	52	34.7	
	Very	38	25.3	
	Extremely	37	24.7	
How confident you feel to recommend to pregnant/lactating women to quit smoking?	Not at all	3	2	53.3
	Slightly	18	12	
	Moderately	49	32.7	
	Very	38	25.3	
	Extremely	42	28	

Table 10. Factor for participants' perceptions of smoking cessation during pregnancy.

Question	Midwives' contribution to smoking cessation during pregnancy	Information and help to quit smoking during pregnancy
Are pregnant women informed about the risks of firsthand, secondhand and thirdhand exposure to tobacco smoke?		0.266
Could the counseling for smoking cessation affect my relationship with the pregnant/ childbearing woman?		0.432
Can smoking help the pregnant woman to manage her stress during pregnancy?		0.560
Do you agree that pregnant women with mental illnesses are preferable to not quit smoking despite manifest with drawal symptoms due to her physical dependence they have on the smoke of cigarettes?		0.544

Midwives play an important role <u>in informing the pregnant smokers</u> about smoking cessation.	0.685	
Midwives play an important role in <u>informing the childbearing smokers</u> about smoking cessation.	0.753	
Smoking cessation is a part of midwifery care.	0.647	
Midwives don't have enough education about smoking cessation.		0.396
The education of of midwives about smoking cessation should be included in undergraduate level.		0.359
If there were smoking cessation settings at maternity hospitals and at maternity clinics it would be more easy to commend them to pregnant smokers.		0.640
If there were smoking cessation settings at maternity hospitals and at maternity clinics the pregnant women would visit and trust them more easily.		0.569
How important do you think the partner's involvement in smoking cessation?		0.569
How capable do you feel to support the pregnant/ childbearing women in smoking cessation?	0.743	
How confident do you feel to speak up at pregnant / childbearing women for the risks of smoking?	0.818	
How confident you feel to recommend to pregnant/lactating women to quit smoking?	0.827	

Table 11. Scores for participants' perceptions of smoking cessation during pregnancy.

	Minimum	Maximum	Mean value (standard deviation)	Median (interquartile range)	Cronbach's a
Midwives' contribution to smoking cessation during pregnancy	0.3	4	2.8 (0.8)	3.2 (2.5 -3.3)	0.87
Information and help to quit smoking during pregnancy	1.1	4	2.4 (0.5)		0.71

Table 12. Multivariate linear regression analysis with knowledge score as the dependent variable and participants' demographic characteristics, smoking cessation education, and smoking status as independent variables.

Variable	β+	SE++	b*	P
Age	0.001	0.003	-0.018	0.940
Gender (Females vs. males)	0.046	0.070	0.051	0.518
Work experience in the field of health in years	-0.002	0.004	-0.108	0.653
Do you have some education about smoking and quitting smoking (Yes vs. No)	0.114	0.028	0.331	**<0.001**
Married (Yes vs. No)	0.048	0.028	0.161	0.089
Level of Education (Master's degree/Doctorate vs. Bachelor's degree/School of midwives)	0.018	0.023	0.060	0.449
Work setting				

Secondary health care vs. Private practice	-0.009	0.041	-0.024	0.818
Tertiary health care vs. Private practice	0.015	0.038	0.042	0.691
Primary health care vs. Private practice	-0.042	0.035	-0.147	0.234
Smoking (Yes vs. No)	-0.041	0.024	-0.133	0.093

+dependence coefficient ++standard error *standard coefficient; *note: The logarithm of the dependent variable has been used.*