

**Deanship of Graduate Studies
Al-Quds University**



**Evaluation of Pap smear test role in the detection of
cervical lesions among West Bank females and the risk
factors associated with them**

Nancy Fawzi Abdallah Falah MD

M.Sc. Thesis

Jerusalem – Palestine

1440-2019

**Evaluation of Pap smear test role in the detection of
cervical lesions among West Bank females and the risk
factors associated with them**

**Prepared by:
Nancy Fawzi Abdallah Falah MD**

**B.SC: General medicine from Al-Quds University
Palestine**

Supervisor: Dr. Ghassan Balosha MD. PhD

**A thesis submitted in partial fulfillment of requirement
for the degree of Master of Public Health/School of
Public Health / Al-Quds University**

1440- 2019



Thesis approval

Evaluation of Pap smear test role in the detection of cervical lesions among West Bank females and the risk factors associated with them

Prepared by Nancy Fawzi Abdallah Falah
Registration No: 21510079

Supervisor: Dr. Ghassan Balosha

Master thesis submitted and accepted, Date:5/5/2019

1. Head of committee: Dr. Ghassan Balosha

Signature :

2. Internal examiner : Dr. Asma Al-Emam

Signature :

3. External examiner: Dr.Shukri Ode

Signature :

Jerusalem – Palestine

1440 - 2019

Dedication

To my father soul

To my great mother for her prayers

To my sisters and brother

To all my friends

Declaration

I certify that this thesis submitted for the degree of Master in Public Health is the result of my own research, except where otherwise acknowledged, and this (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signature:
Nancy Fawzi Abdallah Falah
Date: 5/5/2019

Acknowledgment:

First of all, I am grateful to God (Allah) who enlightened my way in choosing this particular issue for my thesis. Without God's guidance and will, I would not be able to do this work and endure all the obstacles and difficulties I encountered throughout my work. Thank you God.

I would like to give my greatest appreciation to my supervisor, Dr. Ghassan Balosha, for his supervision, encouragement, guidance and patience throughout this study.

I would like to express my thanks to the faculty of public health; Al-Quds University with its entire staff especially Dr. Khaldoun Bader, Dr. Motasem Hamdan and Dr. Nuha Sharif.

I would like to express my wholehearted thanks to my mother, whom I owe my deepest gratitude for her continuous support, inspiration and patience throughout my entire life and particularly through the process of pursuing my master degree. Only because of her love and prayers, I have had the chance to complete this thesis.

My special thanks to Dr Kamal Alshakhra the General Director of Primary Health Directorate and all medical staff at all primary health directorate in Palestinian Ministry of Health for their help, support and hospitality during data collection phase.

I wish to express my gratitude to all my friends and colleagues for their encouragement and endless support.

.

Abstract

Background: Globally cervical cancer is the fourth most common cancer in women, and is considered a highly preventable disease if precancerous lesions are detected and diagnosed before they progress to malignancy.

Palestine lack accurate or rare epidemiological statistical data on cervical lesion but it is estimated that the annual incidence of cervical cancer is 2.4 per 100,000.(Feraly et al,2014) Cervical lesion researches in Palestine have been neglected and the Palestinian health system has not been committed to the cervical screening program, despite the fact that it is a highly preventable disease and multiple modifiable risk factors play a role in increasing its incidence, but unfortunately, few studies about cervical lesion factors were done before in Palestine

This study could be a baseline for decisions makers to develop a national strategy that can help in preventing precancerous and cancerous cervical lesions

Aim & Objectives: This study aims to determine the role of Pap smear screening in the detection of various cervical lesions among Palestinian women. The objective of the study is to determine the associations between the various socio-demographic, reproductive health, participant health status, family history of malignancy, and life style behavior factors as smoking, with the risk of developing different cervical lesions seen as different positive findings in Pap smear test, and by that determine the effectiveness of Pap smear test in detecting cervical lesion.

Study methodology: A cross sectional study design was used. And by using a non-probability convenience sampling method, a 100 female participants from Ramallah governorate were interviewed by the researcher and cervical Pap smears were collected by a Gynecologist and then was tested by specialized pathologist, so three data collection tools were constructed; a face to face questionnaire, a medical form for the use of the physician and laboratory form.

Statistical Analysis: IBM SPSS 23.0 was used for data entry and analysis. Frequencies were calculated for all study variables. Cross tabulation and the significance of Pearson chi-square test or fisher's exact test was used to examine the binary association between dependent and independent variables. Forward logistic regression models comparing odds ratio with confidence interval of 95%. *P-value* < 0.05 was used in the multivariate analysis.

Results: Analysis of the data revealed that Pap smear test was able to detect 82% cervical lesions; 76% were infection, 66% were inflammation, 43% were Candida, 7% were precancerous, 3% were Atypical Squamous cell and 2% were Atypical glandular cells.

In multivariate analysis, age at marriage , age at first baby , high parity, oral contraceptives having vaginal infection, cigarette smoking and water-pipe smoking were the risk factors for cervical lesions with an adjusted odds ratio, 7.6 (CI 95%: 2.5-23), 1.9 (CI 95%: 1.1-3.4), 0.28 (CI 95%: 0.11-0.7) , 4.3(CI 95% 1.3-14.2), 30(CI 95% 9.2-50.7), 1.9(CI 95% 1.8-4.1) and 5.6(CI 95% 1.2-26.2) respectively.

Conclusion: The study revealed that Pap smear test is effective in screening and detecting multiple cervical lesions and factors such as age at marriage, age at first baby, high parity, using oral contraceptives use, having vaginal infection and smoking are all associated with increased risk of cervical lesions. Therefore, the study recommendation for policy makers is to adapt a national strategy and screening program for cervical lesion in Palestine.

تقييم دور اختبار مسحة عنق الرحم في الكشف عن مختلف إصابات عنق الرحم من آفات او سرطان، بين إناث الضفة الغربية وعوامل الخطورة المسببة له

اعداد: نانسي فوزي عبد الله فلاح

اشراف: د. غسان بعلوشة

ملخص

خلفية الدراسة: سرطان عنق الرحم عالمياً هو السرطان الأكثر شيوعاً لدى النساء، ويعتبر مرضاً يمكن الوقاية منه بشكل كبير إذا تم اكتشاف وتشخيص وعلاج الآفات الحميدة التي تسبق المرض الخبيث.

تفتقر فلسطين إلى بيانات إحصائية دقيقة أو حتى لا توجد بيانات إحصائية عن آفة عنق الرحم، لكن يقدر أن معدل الإصابة بسرطان عنق الرحم السنوي هو 2.4 لكل 100,000 شخص. (Feraly et., 2014)

نادرة هي أبحاث سرطان عنق الرحم في فلسطين، ولا يلتزم نظام الصحة الفلسطيني ببرامج فحص عنق الرحم ، على الرغم من أنه مرض يمكن الوقاية منه بشكل كبير، كما أن عوامل الخطورة المتعددة له القابلة للتحويل تؤدي دوراً في زيادة حدوثه، ولكن للأسف يوجد القليل من الدراسات عن عوامل الخطورة المؤدية لأمراض عنق الرحم في فلسطين.

لذلك تعد هذه الدراسة بمثابة نقطة الإنطلاق الأولى لصانعي القرارات لوضع خطة استراتيجية وطنية يمكن أن تساعد في الوقاية من آفات عنق الرحم المسببة لسرطان عنق الرحم

أهداف الدراسة: تهدف هذه الدراسة إلى تحديد دور فحص مسحة عنق الرحم في الكشف عن آفات عنق الرحم المختلفة بين النساء الفلسطينيات. وكذلك تحديد الارتباط بين مختلف العوامل الاجتماعية - الديموغرافية، والصحة الإنجابية، والحالة الصحية للمشاركين، والتاريخ العائلي للأورام الخبيثة، وعوامل السلوك مثل التدخين، مع خطر الإصابة بآفات عنق الرحم المختلفة التي تظهر على شكل نتائج إيجابية في اختبار مسحة عنق الرحم، والتي تحدد فعالية اختبار مسحة عنق الرحم في الكشف عن آفة عنق الرحم.

منهجية الدراسة: اعتمدت الدراسة تصميم دراسة مقطعية. وباستخدام الطريقة الغير احتمالية لأخذ العينات ، حيث تمت مقابلة 100 امرأة من محافظة رام الله وتم جمع عينة مسحة عنق الرحم لهم من قبل أطباء متخصصين ، وتمت قراءة النتائج من قبل أخصائي علم الأنسجة، حيث تم بناء ثلاث

أدوات لجمع البيانات. الأداة الأولى كانت عبارة عن استبيان يعبئ من قبل الباحث، والثانية كانت تقرير طبي يعبئ من قبل الطبيب، والثالثة عبارة عن تقرير مخبري يعبئ من قبل اخصائي الأنسجة.

التحليل الإحصائي : تم إدخال جميع البيانات وتحليلها باستخدام برنامج SPSS-IBM 23. تم احتساب النسب لجميع المتغيرات في الدراسة. من تم استخدام اختبار Pearson chi-square لفحص الارتباط الثنائي بين المتغيرات المستقلة والغير مستقلة. ومن ثم تم استخدام نماذج الانحدار اللوجستي لمقارنة نسبة الأرجحية حيث استخدمت قيمة $p > 0.05$ في التحليل متعدد المتغيرات.

النتائج الرئيسية: كشف تحليل البيانات أن اختبار مسحة عنق الرحم تمكن من الكشف عن 82% من آفات عنق الرحم. كان 76% منهم مصابين بالالتهابات المعدية ، 66% منهم كانوا مصابين بالإحتقان، و43% كانوا مصابين بنوع من الفطريات (المبيضة)، 7% خلايا ما قبل السرطانية في التحليل متعدد المتغيرات، كان العمر عند الزواج، والعمر عند الطفل الأول، وتعدد الولادات، وموانع الحمل، الالتهابات المهبلية، وتدخين السجائر وتدخين الأرجيلة عوامل خطورة لآفات عنق الرحم مع نسبة الأرجحية المعدلة، 7.6 (95% CI: 2.5-23) ، 1.9 (95% CI: 1.1-3.4) ، 0.28 (95% CI: 0.11-0.7) ، 4.3 (95% CI: 1.3-14.2) ، 30 (95% CI: 9.2-50.7) ، 1.9 (95% CI: 1.88-4.1) و 5.6 (95% CI: 1.2-26.2) على التوالي.

الخاتمة: كشفت الدراسة أن اختبار مسحة عنق الرحم فعال في فحص وكشف آفات عنق الرحم المتعددة وأن العمر عند الزواج ، والعمر عند الطفل الأول، وتعدد الولادات ، واستخدام موانع الحمل، الالتهابات المهبلية كلها مرتبطة بزيادة خطر آفات عنق الرحم لذا، فإن هذه الدراسة توصي صانعي القرار بالعمل على ايجاد استراتيجيات وطنية وبرنامج ممنهج للإستصقاء عن آفات عنق الرحم باستخدام مسحة عنق الرحم في فلسطين.

List of abbreviations

ACOG	American Congress of Obstetricians and Gynecologists
ACS	American Chemical Society
AGCUS/AGC-NOS	Atypical Glandular cells of undetermined significance
AOR	Adjusted Odds Ratio
ASCP	American Society for Clinical Pathology
ASC-US	Atypical squamous cell of undetermined significance
ASR	Age Standardized Rate
CDC	Centre of Disease Control and Prevention
CI	Confidence Interval
CIN	Cervical Intraepithelial Neoplasia
COR	Crude Odds Ratio
CVD	Cardiovascular Disease
DALYs	Disability Adjusted life years
DHIS2	District Health Information System 2
DM	Diabetes Mellitus
DNA	Deoxyribonucleic acid
EA	Ethyl-alcohol
ECA	Epithelial Cell Abnormalities
GBD	Global Burden of Disease
HCL	Hydrochloric acid
HPV	Human Papillomavirus
H₂O	Water
HR	Hazard Rate
HSIL / HGSIL	High- Grade Squamous Intraepithelial Lesion
HTN	Hypertension
IACR	International Agency for research on Cancer
IUD	Intrauterine Device
Krt	Keratin
LSIL / LGSIL	Low Grade Squamous Intraepithelial lesion
MOH	Ministry of Health
NGOs	Non-governmental organization
NIH	National Institute of Health
NILM	Negative for Intraepithelial Lesions or Malignancy
OCP/OC	Oral contraceptive pills
OR	Odds Ratio
OS	Ostium
Pap	Papanicolaou
PAS staining	Periodic acid–Schiff staining
Ph	Potential hydrogen
PHC	Primary Health Directorate
PV	Vaginal Examination
RNA	Ribonucleic acid
RR	Relative Risk

SCC	Squamous cell carcinoma
SC junction	Squamocolumnar junction
SIL	Squamous Intraepithelial Lesion
SPSS	Statistic Package for Social Sciences
STIs	Sexual Transmitted Infections
UAE	United Arab Emirates
UK	United Kingdom
UNRWA	United Nation Relief and Work Agency
USPSTF	United States Preventive Services Task Force
US/USA	United State of America
WHO	World Health Organization

Table of contents

Declaration	I
Acknowledgment.....	II
Abstract	III
ملخص الدراسة باللغة العربية.....	V
Chapter One: Introduction	1-14
1.1 Background	1
1.2 Cervix.....	2
1.3 Cervix metaplasia	4
1.4 Pap Smear	5
1.5 Bethesda classification system.....	10
1.6 Study problem.....	10
1.7 Justification of the study.....	11
1.8 Aim of the study.....	12
1.9 Objectives.....	12
1-10 Expected outcomes.....	13
1-11 Study Limitation.....	13
Chapter Two: Literature review	15-36
2.1 Introduction.....	15
2.2 Cervical Cancer epidemiology worldwide.....	15
2.3 Cervical cancer epidemiology in the Arab world.....	15
2.4 Cervical cancer epidemiology in Palestine.....	18
2.5 Risk factors for cervical lesions	19
2.5.1 Exogenous Factors.	20
2.5.1.1 Sexually transmitted disease and risk for cervical lesions.....	20
2.5.1.2 Tobacco smoking and risk for cervical lesions	23
2.5.1.3 Socioeconomic factors and risk of cervical lesions.....	25
2.5.1.4 Reproductive health and risk for cervical lesions	26
2.5.1.5 Contraceptive hormones, devices and risk for cervical lesions.....	29
2.5.2. Endogenous Factors	31
2.5.2.1 Demographic factors and risk for cervical lesions	31
2.5.2.2 Genetic susceptibility and risk for cervical lesions.....	32
2.5.2.3 Family history and risk for cervical lesions	33
2.6 Pap smear screening test and role in detecting cervical lesion	34
Chapter Three: Conceptual Framework	37-44
3.1 Cervical lesions definition.....	37
3.2. Cervical cancer definition.....	37
3.3. Cervical lesion determinants risk factors models.....	37
3.4 Independent variables	39
3.4.1 Socio-demographic variables	39
3.4.2 Environmental variables	39
3.4.3 Life Style factors	41
3.4.4 Reproductive health factors	41
3.4.5 Family history and genetic factors	41
3.5 Dependent variables	42
3.5.1 Precancerous and cancerous lesions with positive Pap smear	42
Chapter four: Methodology.	44-50
4.1 Introduction	44

4.2 Study setting	44
4.3 Study Design	45
4.4 Study population	45
4.4.1 Inclusion criteria	46
4.4.2 Exclusion criteria.....	46
4.5 Study period	46
4.6. Sampling and sample size	46
4.7. Data source and study tools.....	47
4.7.1 Structured interview questionnaire	47
4.7.2 Medical forms	48
4.7.3 Lab results forms	48
4.7.4 Validations of the instruments	48
4.8 Field work	49
4.8.1 Interviews.....	49
4.8.2 Pap smear samples.....	49
4.8.3 Laboratory Histopathology results.....	50
4.9 Statistical analysis.....	50
4.10 Ethical approval.....	50
Chapter Five: The Results	51-74
5.1. Introduction	51
5.2. Part 1 ; Descriptive analysis	51
5.2.1 Socio-demographic characteristics	51
5.2.2 Reproductive health related characteristics	51
5.2.3 Past medical history	51
5.2.4 Family and genetic history	51
5.2.5 Smoking behavior	54
5.2.6 Medical symptoms and signs.....	55
5.2.7 Histopathology findings	56
5.3 Part 2: Association between dependent and independent variables.....	57
5.3.1 Risk factors association with positive Pap smear test	57
5.3.2 Risk factor association with different Pap smear findings.....	62
5.4 Multivariate association	72
5.4.1 Positive Pap smear results	72
5.4.2 Inflammation in Pap smear.....	73
5.4.3 Infection in Pap smear.....	73
5.4.4 Candida in Pap smear.....	74
5.4.5 Precancerous cells in Pap smear.....	74
Chapter six : Discussion.....	75-85
6.1 Introduction.....	75
6.2 Socio- demographic study factors	75
6.2.1 Age factor.....	75
6.2.2 Socioeconomic factors.....	75
6.3 Reproductive health factors.....	76
6.3.1 Age at marriage factor	76
6.3.2 Age at first childbirth factor	77
6.3.3 Parity	77
6.3.4 Contraceptive factors	78

6.4 Medical history	79
6.5 Family history and genetic factors	81
6.6 Smoking life style factor.....	82
6.7 Pap smear test.....	83
6.8 Conclusions	84
6.9 Recommendations	84
6.9.1 Recommendations for policy makers and health care team	84
6.9.2. Recommendations for the Palestinian female	85
6.9.3. Recommendations for future researchers	85
References	86-101
Annex 1: The Questionnaire	102
Annex 2: Medical form to be filled by Gynecologist.....	106
Annex 3: Lab Result Form.....	107
Annex 4: The Letter from Al-Quds University to MOH	108
Annex 5 : The Letter from Al-Quds University to Al-Zakat Committee	109
Annex 6: The Letter from Al-Quds University to the Gynecologists.....	110
Annex 7: Letter of approval from PHC in MOH.....	111
Annex 8: Consent Form	112