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# Factors associated with low birthweight in Palestinian refugees at Al-Wehdat camp, Jordan: a cross-sectional study using routine data

Shirin Aliabadi, Majed Hababeh, Akiko Kitamura, Shakoor Hajat

## Abstract

**Background** Low birthweight (LBW), defined as a birthweight of less than 2500 g, is a leading cause of infant morbidity and mortality worldwide. Previous studies have shown that the risk of LBW is higher in vulnerable populations, such as refugees. Few studies have assessed the prevalence and associated risk factors of LBW in refugee populations using routine monitoring data. This study sought to measure the prevalence of LBW and associated risk factors in refugees in Al-Wehdat Camp in Jordan using routine monitoring data.

**Methods** The study examined a dataset that included 3916 births from mothers registered in the UNRWA e-Health database between June 1, 2016, and June 30, 2017. The dataset was cleaned and variables were analysed. The variables were parity, mother's age, maternal education level, marital status, mother's occupation, multiple pregnancies, presence of complications, diastolic hypertension above 90 mm Hg, place of delivery, number of antenatal visits, sex of infant, infant year of birth, infant month of birth, and type of service received (family planning or antenatal services). Continuous variables were grouped into categorical (eg, parity, number of antenatal visits, mother's age) or binary variables (eg, infant's birthweight). Bivariable and multivariable logistic regression were employed to evaluate the association between previously identified potential risk factors and LBW outcomes. The resulting odds ratios (ORs) and adjusted ORs were evaluated.

**Findings** The prevalence of LBW was 6.3% (246 of 3916). In the crude analysis, significant associations were found between the presence of maternal complications (OR 2.86; 95% CI 2.02–4.04) with LBW outcomes. Significant associations were also found between women that did not receive full antenatal services (OR 1.36; 95% CI 1.03–1.78) and LBW outcomes. Multivariable analyses showed that LBW outcomes were higher with maternal complications (adjusted OR 2.85; 95% CI 2.10–4.24) and receipt of full antenatal services over receiving only family planning (1.37; 95% CI 1.04–1.81), when adjusting for the a priori confounders.

**Interpretation** The study identified positive associations between LBW outcomes and maternal complications and the type of health service received. No other associations were significant, but some variables confounded the relationship between maternal complications and LBW outcomes. The study supports findings from previous studies, such as an increased risk of LBW outcomes when maternal complications are coupled with no family planning. The implications of this study are that prevention of maternal complications should be improved and that there should be better care of women with such complications. In addition, family planning services should be available to all women. Further research is required to form robust policies to reduce the burden of LBW in the context of vulnerable Palestinian refugees.

**Funding** None.

## Contributors

AK and MH provided the data and provided partial supervision of the project. SA carried out the statistical analysis with input from SH. SA wrote the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Use of the national electronic maternal and child health registry (MCH eRegistry) in primary care clinics in occupied Palestinian territory: a pilot time-motion study

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## Abstract

**Background** In primary care maternal and child health clinics in occupied Palestinian territory, documentation and reporting consume considerable time for care providers. An electronic maternal and child health registry (MCH eRegistry), with point-of-care clinical decision support, is being implemented nationally in governmental clinics. We conducted a pilot study of time spent by care providers on important tasks, in preparation for a trial to compare eRegistry and non-eRegistry clinics.

**Methods** We conducted semi-structured interviews of ten nurse-midwives from six governmental clinics in the West Bank to map clinical workflows, and developed a data collection tool for time-motion observations. In May, 2017, observers recorded one workday in three eRegistry and three non-eRegistry clinics. For each consultation, we calculated the median time spent (in minutes) on each task, and then compared time spent in eRegistry and non-eRegistry clinics using Wilcoxon rank-sum tests. Ethics approvals were obtained from the Palestinian Health Research Council and Regional Ethics Committee, Norway. Informed consent was obtained from all pregnant women.

**Findings** Twelve antenatal consultations (four first booking visits, eight follow-up visits) were observed in eRegistry clinics and 39 (four first visits, 35 follow-up visits) in non-eRegistry clinics. The median duration of booking visits was 19·9 min (IQR 12·9) in eRegistry clinics and 22·1 min (24·9) in non-eRegistry clinics. In eRegistry clinics, the median duration of follow-up visits was 14·6 min (17·3), of which the median clinical examination time was 1·7 min (0·6) and median health information management time was 5·3 min (5·8). In non-eRegistry clinics, the median duration of follow-up visits was 8·8 min (8·7), of which the median clinical examination time was 2·5 min (2·9) and health information management time was 4·6 min (2·0). This pilot study was not sized for comparisons; health information management time was not statistically different between groups ( $p=0\cdot1$ ).

**Interpretation** Health information management constituted large parts of limited antenatal consultation time. The pilot provided data to estimate that the upcoming trial must include a sample of 24 clinics and 210 observations, with similar proportions of booking and follow-up consultations in both arms, to observe meaningful differences in time consumption with sufficient statistical power.

**Funding** European Research Council and Research Council of Norway.

## Contributors

TA contributed to data collection and to writing of the Abstract. MV carried out data analysis, data interpretation and contributed to writing of the Abstract. MHL carried out data collection and data analysis. KAK and TH contributed to data collection. BG contributed to data collection and revision of the Abstract. KM contributed to data analysis. AR and RS contributed to revision of the Abstract. JFF contributed to data analysis, data interpretation and revision of the Abstract. All authors have seen and approved the final version of the Abstract for publication.

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# Dental caries experience and related factors among a clustered random sample of students in occupied Palestinian territory: a cross-sectional study

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## Abstract

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**Background** Dental caries is still the most prevalent chronic disease worldwide. In the occupied Palestinian territory, data about oral health status and its determinants are scarce. This study aimed to assess the prevalence of dental caries and associated factors among schoolchildren in a random sample of marginalised schools in the West Bank.

**Methods** Marginalised schools (according to the School Support Program [SPP] criteria) were stratified by district, gender, and grade level to select a random sample of 20 schools. Students in the sixth and ninth grades were interviewed by senior dental students about their oral hygiene and diet habits. Students' weight, height, gingival health, and dental caries experience were assessed. Senior dental students were trained and calibrated to carry out the interviews and the examinations. Parental informed consents were collected by school administrative staff. Ethics approval for the study was obtained from the Al-Quds University Scientific Research Ethics Committee.

**Findings** In total, 1282 students completed the interviews and the clinical screening. The mean decayed, missing and filled teeth (DMFT) index was 6.4 (SD 4.4). According to the WHO dental caries experience classification, 49% (309 of 623) of the sixth grade students and 74% (484 of 658) of the ninth grade students fell in the high and very high categories. The mother's level of education and recent visit to the dentist correlated negatively with DMFT score ( $\rho=-0.06$ ,  $p=0.029$ ;  $\rho=-0.063$ ,  $p=0.024$ ). BMI was correlated positively with DMFT ( $r=0.092$ ,  $p=0.001$ ). Drinking milk and fresh juices was related to lower DMFT scores ( $r=-0.077$ ,  $p=0.006$  and  $r=-0.072$ ,  $p=0.010$ ). In the final model, grade ( $\beta=0.314$ ,  $p<0.0001$ ), gender ( $\beta=0.058$ ,  $p=0.034$ ), recent visit to the dentist ( $\beta=-0.059$ ,  $p=0.029$ ) and drinking fresh juices ( $\beta=-0.054$ ,  $p=0.047$ ) were significant factors in explaining the high level of dental caries in this sample.

**Interpretation** Students in the marginalised schools of the West Bank have high DMFT scores that indicate high prevalence of dental caries. Access to dental care and bad oral health habits are associated with high disease prevalence. Interventions to improve access to care and increase awareness about healthy diet and hygiene habits are crucial to alleviate the burden of oral disease in this population.

**Funding** AMIDEAST School Support Program (SSP).

### Contributors

EK designed the study, collected and analysed data, and drafted the Abstract. AH contributed to data collection and data entry. MH contributed to the study design. FM contributed to the study design and data collection. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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We thank the dental students of Al-Quds University who helped with the clinical screening of schoolchildren and data collection.

# Prevalence of anaemia in children newly registered at UNRWA schools: a cross-sectional study

Nada Abu Kishk, Majed Hababeh, Suha Saleh, Yassir Turki, Zohair el Khiteb, Nimer Kassim, Hasan Arab, Wafaa Zeidan, Akihiro Seita

## Abstract

**Background** Children entering first grade at United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) schools across the five fields of its operations (West Bank, Gaza, Lebanon, Jordan, and Syria) complete a comprehensive medical examination at UNRWA health centres as a requirement for their acceptance. Our study aimed to assess the prevalence of anaemia and undernutrition indicators in these children.

**Methods** We conducted a cross-sectional study at 59 UNRWA health centres, targeting all children entering grade one at UNRWA schools in Gaza, West Bank, Syria, and Lebanon in 2017. The children included boys and girls living inside and outside Palestine refugee camps. Using Epi-Info V2000, a weighted sample of 2399 was calculated (Gaza, 961; West Bank, 982; Syria, 334; Lebanon, 622) based on the prevalence of anaemia in a previous study (2005) and the total number of first grade students at UNRWA schools during the school year 2016–2017, with a confidence level of 95% and precision of 3%. Descriptive statistics were obtained and chi squared tests were carried out using SPSS v22. Child growth z-scores were calculated using WHO Anthroplus software. Informed verbal consent was obtained from parents.

**Findings** 2419 students (1278 females and 1141 males) aged 6.1 (SD 0.4) years were examined. The prevalence of anaemia (haemoglobin level of <11.5 mg/dL) was 25.0% (Gaza, 29.3%; West Bank, 22.0%; Syria, 30.0%; and Lebanon, 18.3%) with no significant differences between males and females ( $p=0.383$ ). The mean haemoglobin level was 12.0 [SD 0.9] mg/dL. Stunting, underweight, and thinness were assessed according to WHO growth indicators. The overall prevalence of stunting, underweight, and thinness were 3.2%, 3.5%, and 5.6%, respectively, with the highest levels found in Syria (4.3%, 6.3%, and 10.1%, respectively).

**Interpretation** The overall prevalence of anaemia in surveyed children (25.0%) was higher than in the 2005 study (19.5%). However, the prevalence in children in Gaza (29.3%) was lower than in 2005 (36.4%). Haemoglobin testing should be included as part of the medical examination for new school children. In addition, malnutrition among these children should be investigated further.

**Funding** Health Programme at UNRWA Headquarters, Amman, Jordan.

### Contributors

NK designed the study, collected and interpreted data, carried out data management, and wrote the Abstract. MH interpreted data and revised the Abstract. SS input data for analysis, analysed data, and produced tables and figures. ZK, NK and HA collected and interpreted data, and carried out data management. YS wrote and revised the Abstract. WZ designed the study. AS interpreted data and revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

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# Addressing the social determinants of health through public health policy: a case study of US-based advocacy efforts for health justice in occupied Palestinian territory

Cindy Sousa, Amy Hagopian, Nancy Stoller

## Abstract

**Background** Policy development, one of the core functions of public health, is often achieved through professional associations leveraging disciplinary expertise and values via their official policy statements. The 140-year-old American Public Health Association (APHA) has adopted hundreds of policy statements, including several focused on the health implications of war and armed conflict, both in general, and in Iran, Iraq, the Persian Gulf, Nicaragua, El Salvador, and Vietnam. Yet, despite four attempts, the APHA has failed to pass a resolution addressing the health consequences of the Israeli occupation of Palestine. Here, we document the need for solidarity between health professionals in the USA and occupied Palestinian territory, and identify mechanisms predicting success of professional advocacy based on a commitment to international health justice.

**Methods** We conducted a case study, drawing on extensive literature review, historical analysis, examination of APHA procedures and documents, and interviews with organisations that have been successful in professional advocacy in addressing US policy as it relates to occupied Palestinian territory.

**Findings** Findings point to four factors within US academic institutions that underlie the advancement of policies relating to occupied Palestinian territory: (1) the moment in history and the political environment; (2) the organisation's history of taking controversial policy stands; (3) the rhetorical strategies deployed; (4) the organisation's structure and process of decision making. We applied these factors to our case study.

**Interpretation** Findings reveal profound differences in understanding among US public health professionals regarding the effects of the occupation of Palestinian territory on public health in the region. Results suggest that fear of controversy interferes with what should otherwise be an obvious response for US public health professionals. For public health resolutions that are deemed politically controversial, advocates need to adjust the language to respond to the historical moment, and history and culture of the organisation, to effectively counter deflective rhetorical strategies, and to acknowledge the formal and informal power of stakeholders within governing structures.

**Funding** None.

## Contributors

CS, AH, and NS contributed to the study design, and to data collection, analysis, and interpretation. CS wrote the Abstract, with input from AH and NS.

## Declaration of interests

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# Pharmacological prophylaxis of venous thromboembolism in adult medical and surgical wards in the Gaza Strip: a multi-centre clinical audit

Yousef Abuowda, Mohammad Alswerki, Abdelrahman Alsheikh Ahmad, Maha Alfaqawi, Tayseer Afifi, Hasan Alyazouri, Abdelrahman Alqedra, Bettina Böttcher

## Abstract

**Background** Hospital-acquired venous thromboembolism (VTE) has a reported worldwide prevalence of 0·8–11%. It is the most common cause of preventable death, underlining the importance of VTE prevention.

**Methods** This clinical audit was conducted in adult medical and surgical wards of three hospitals in Gaza, from March to August, 2017. Patients were assessed prospectively using the modified Padua Prediction Score risk assessment model and the Caprini Score to categorise patients as having high or low risk of developing VTE. Approval was obtained from the General Directorate of Human Resources of the Ministry of Health.

**Findings** In total, 300 medical patients were included, with a mean age of 54 years (SD 22 years) and a mean hospital stay of 4 days (SD 2·5 days). Of these patients, 49·7% (149 of 300) had a Modified Padua score of 4 or greater (anticoagulants indicated), of whom 84·6% (126 of 149) received anticoagulants in accordance with guidelines, whereas 15·4% (23 of 149) did not. Of the 50·4% of patients (151 of 300) with a score of less than 4 (anticoagulants not indicated), 64·2% (97 out of 151) had no VTE prophylaxis, whereas 35·8% (54 out of 151) received it without indication. In total, 150 surgical patients were included, with a mean age of 32 years (SD 14·7 years) and a post-operative stay of 3 days (SD 1·5 days). Of these patients, 43·3% (65 of 150) had a Caprini score of greater than 2 (anticoagulants indicated), 69·2% (45 of 65) received anticoagulants in accordance with guidelines, but 30·7% (20 of 65) did not. Of the 56·7% of patients (85 of 150) with a score of 2 or lower (anticoagulants not indicated), 82·3% (70 out of 85) had no VTE prophylaxis, whereas 17·7% (15 out of 85) received it without indication.

**Interpretation** The results reflect poor adherence to current standards of care for VTE prophylaxis, demonstrating that an action plan for appropriate heparin prescription is needed for each hospital. Action plans involving hospital pharmacy departments, multidisciplinary care, good communication within teams, and staff education are underway. A re-audit is planned following this action.

**Funding** None.

## Contributors

YA, MF, and AA designed the study, contributed to data collection, carried out data analysis and interpretation, and wrote the Abstract. All authors have seen and approved the final version of the Abstract for publication.

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# Prevalence of metabolic syndrome among school children aged 6–18 years in Ein Al-Helwa Palestinian Refugee Camp, Lebanon: a cross-sectional study

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## Abstract

**Background** Metabolic syndrome is characterised by the presence of several metabolic abnormalities, including hyperglycaemia, central obesity (also known as abdominal obesity), elevated blood pressure, and an abnormal blood lipid profile. The prevalence of metabolic syndrome is rising rapidly around the world as childhood obesity is increasing. The aim of this study is to determine the prevalence of metabolic syndrome in school children aged 6–18 years residing in Ein Alhelwe Refugee camp in Saida, Lebanon.

**Methods** School children aged 6–18 years from the first to twelfth grades from two United Nations Relief and Works Agency (UNRWA) schools were randomly chosen. We used a school-based cross-sectional study design with two stages. The first stage included measurements of weight, height, body mass index (BMI), waist circumference, and blood pressure. In the second stage, blood tests were carried out for fasting blood sugar, triglycerides, and high-density lipoprotein (HDL). Approval was obtained from the ethics committee at Al Hamshari Hospital in Saida, Lebanon. Written permission was obtained from the UNRWA and the principals of the two schools for the first stage, and informed written consent was obtained from parents on behalf of the children involved in the second stage of the study.

**Findings** The first stage of the research included 487 participants (258 female, 229 male) and the second stage included 73 participants (36 overweight participants [12 male, 24 female] and 37 obese participants [19 male, 18 female]). The prevalence of overweight and obesity were 15.2% (74 of 487) and 14.4% (70 of 487) among all age groups, respectively. Among Palestinian refugee school children in Saida aged 10–18 years, the prevalence of metabolic syndrome was more pronounced when the modified National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP-III) definition was used (30.9%; 21 of 68) compared to the International Diabetes Federation (IDF) definition (11.8%; eight of 68), with no statistical differences between male and female participants. Note that the IDF definition can be applied to children aged 10–18 years, of whom there were 68 participants, and for comparison between IDF and NCEP ATP-III, prevalence of metabolic syndrome was calculated for participants in this age range. Low HDL cholesterol (52.1%; 38 of 73), central obesity (46.6%; 34 of 73), and raised blood pressure (42.5%; 31 of 73) were the leading three common metabolic abnormalities among children who were overweight or obese.

**Interpretation** This study has shown that metabolic syndrome is common among children who are obese or overweight, who are aged 10–18 years, living in Ein Al-Helwa Refugee Camp in Saida, Lebanon. These data raise the importance of early prevention and treatment of metabolic syndrome and its components (abdominal obesity, elevated triglycerides, reduced HDL cholesterol, elevated blood pressure, and elevated blood glucose) to reduce the risk of diabetes and cardiovascular complications in susceptible individuals. A potential limitation of this study is that the small sample size may not accurately reflect the prevalence of metabolic syndrome.

**Funding** Palestinian Civil Society Organizations Commission, Life Hope Center, and Palestinian Red Crescent Society Al Hamshari Hospital.

## Contributors

AA designed the study. AA, MT, AN, DQ, HM, and DY collected data. AA analysed data. AA and MT interpreted data. AA and MT drafted and revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

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# Retrospective analysis of arteriovenous fistula patency and failure in patients on dialysis for end-stage kidney disease in the Gaza strip

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## Abstract

**Background** The preservation of patent, well-functioning arteriovenous fistulas is one of the most difficult clinical problems in the long-term management of patients undergoing renal dialysis. This study aimed to define the patency and failure rates of fistulas in patients with end-stage kidney disease on dialysis and to examine how fistula failure is managed.

**Methods** Data regarding disease history and long-term patency and failure of hemodialysis arteriovenous fistulas were collected from patients and patients' charts in five dialysis centres in the Gaza strip, including a specialised centre for paediatric dialysis, from May, 2017, to October, 2017, using a specifically designed data collection sheet. Informed written consent was obtained from participants upon enrolment.

**Findings** Data were collected from 606 patients with end-stage kidney disease on dialysis. The mean age was 50·3 (SD 18·6) years and 56% (339 out of 606) were males. The mean age at diagnosis was 45 (19·9) years and at first fistula creation was 46·2 (19·2) years. Hypertension was the most common cause of end-stage kidney disease (34·7%; 210 of 606), followed by diabetes mellitus (26%; 158), and obstructive uropathy (11·6%; 70). Failure of the first fistula was reported for 36% (97 of 267) of females and 31% (105 of 339) of males. The failure rate at 1 month was 21% (43 of 202) for first fistulas and 13% (six of 45) for second fistulas. Hypertension was reported for 77% (156 of 202) of patients who encountered failure. Of first fistulas, failure was reported for 61% (21 of 34) of right distal, 39% (52 of 133) of left distal, 37% (37 of 101) of right cubital, and 31% (91 of 201) of left cubital fistulas, indicating that the site of placement of the first arteriovenous fistula might have had a role in determining failure. The mean time until fistula failure after creation was 0·8 years (SD 2·0, range 0–13) for first fistulas and 0·1 years (0·79, 0–8) for second fistulas. Most fistulas were created as direct arteriovenous fistula anastomoses. Synthetic grafts were used in three cases for first fistulas and in eight cases for second fistulas. The failure rate for synthetic graft fistulas was higher than for direct anastomosis, and the failure rates were 60% (two of three) and 62% (five of eight) for first and second synthetic graft fistulas, respectively. The management of fistula failure involved creating a new fistula in 85·6% (173 of 202) of first fistulas and 49% (22 of 45) of second fistulas. Of the 606 patients, 48 were paediatric patients younger than 18 years, with a mean age of 13 (3·6) years; two-thirds (60·4%, 29 of 48) of these patients were male. Their mean age at diagnosis was 7 years (SD 5·4) and the most prevalent aetiologies were congenital (40%; 20 of 48), obstructive uropathy (21%; ten), and glomerulonephritis (12%; six). Half of these patients (24 of 48) were on dialysis via a central line and all others had arteriovenous fistulas for dialysis. Proximal sites of the right and left upper forearms were preferred over distal sites for the first fistula in most cases, failure was reported in a third (16 of 48) of cases, and the mean duration of fistula patency before failure was 1 year (range 0–8 years). Of the patients who encountered fistula failure, 12 had direct anastomosis fistulas with the right cubital fossa as the preferred site. In five of these cases, failure of the second fistulas was encountered within 3 years.

**Interpretation** Hypertension was the major cause of end-stage kidney disease, and this necessitates the proper recognition and management of hypertension, especially among middle-aged people (35–60 years). Female sex, hypertension, distal (versus proximal) placement of fistulas, and operations outside of Ministry of Health hospitals were found to be risk factors for fistula failure. The high failure rates at 1 month are likely to be due to technical issues relating to surgery, as fistulas are not used for dialysis before 1 month. To improve patency, preference should be given to direct anastomosis arteriovenous fistulas rather than synthetic grafts.

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## Contributors

AA, MK, and KE designed the study. All authors contributed to data collection. AA, MA, and KA carried out data analysis and interpretation. AA and KE wrote the Abstract. All authors have seen and approved the final version of the Abstract for publication.

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# Determinants of food insecurity in occupied Palestinian territory: a cross-sectional survey

Davod Ahmadi, Hugo Melgar-Quiñonez

## Abstract

**Background** Food insecurity is a major issue facing Palestinians. According to the latest statistics (from 2014), 1·6 million people in Palestinian territory are food insecure. Specifically, 20% of the population of the West Bank and over 50% of the population of the Gaza Strip live in food insecurity. High rates of poverty, high food prices, and economic shocks influence food insecurity. The objective of this study was to explore the major determinants of food insecurity in Palestinian territory.

**Methods** Data from the Gallup World Poll (GWP) from 2014 to 2017 were used (n=1000 per year). The target population in the GWP is the entire civilian non-institutionalised population aged 15 years and older. All sample selection is probability based and nationally representative. The GWP surveys an average of 1000 sample individuals per country. The Food Insecurity Experience Scale (FIES) was used as the dependent variable. The FIES measures individuals' food security status, and it is composed of eight questions with simple dichotomous responses (1=yes, 0=no). Respondents are asked whether, at any time during a certain reference period, they have worried about their ability to obtain enough food, their household has run out of food, or they have been forced to compromise the quality or quantity of the food that they ate owing to limited availability of money or other resources to obtain food. Sociodemographic, economic-related, and health factors were used as the independent variables. Different statistical analyses, such as descriptive, unadjusted, and adjusted binary logistic regression were carried out.

**Findings** Results from descriptive analysis showed significant differences in the frequency of severe food insecurity status on the FIES scale between 2014 and 2017 (2014, 27·3%; 2015, 26·0%; 2016, 22·1%; 2017, 24·6%). In terms of economy-related factors, more than 50% of the sample reported no confidence in national government, and more than three-quarters of the sample reported low local job opportunities. Approximately 55% of the sample reported having poor personal health. Findings from unadjusted logistic regression indicated that food insecurity was highest among the poorest 20% (odds ratio [OR] 25·64;  $p<0\cdot0001$ ), those with low education (completed elementary education; 3·802;  $p<0\cdot0001$ ), those with unemployed status (3·192;  $p<0\cdot0001$ ), and those living in a household with more than seven people (1·576;  $p<0\cdot0001$ ). Furthermore, food insecurity status increased with low local job opportunities (2·932;  $p<0\cdot0001$ ). Results of adjusted logistic regression analysis showed that females were more food insecure (1·335;  $p<0\cdot0001$ ) than their male counterparts. Among people aged 26–49 years, food insecurity was high (2·244;  $p<0\cdot0001$ ) compared with other age groups. The probability of being food insecure was higher in people with low education (3·943;  $p<0\cdot0001$ ). Importantly, Financial Life Index index was strongly related to food security. This index measures respondents' personal economic situations and the economics of the community in which they live. People with a low Financial Life Index were more food insecure (OR 24·27;  $p<0\cdot0001$ ). Probability of being food insecure was high among people with poor personal health status (2·546;  $p<0\cdot0001$ ). In conclusion, this study found food insecurity to be associated with different sociodemographic, health-related, and economy-related factors.

**Interpretation** Very strong linkage was observed between food security status and Financial Life Index. In fact, macroeconomic conditions contribute to people's food security status through influence on job opportunities. Consistent with this, job status and employment opportunities affect income directly, and are found to be significantly related to food security in Palestinians. Food security status reflects individuals' health and wellbeing. In this study, a strong association was observed between Palestinians' poor health and their food security status. In developed countries, education can help to promote a healthy lifestyle by increasing nutritional knowledge. However, in developing countries, education can—through providing better job opportunities—directly influence income, which affects food security status. In this study, Palestinians with low education reported being food insecure. Palestinians living in rural areas were food secure and females were found to be more food insecure than their male counterparts.

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### Contributors

DA contributed substantially to the study design, analysed data and drafted the Abstract. DA and HM contributed to the Interpretation section of the Abstract. HM gave final approval for the Abstract. Both authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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# Impact of mastectomy on quality of life in female patients with breast cancer in the Gaza Strip: a cross-sectional study

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## Abstract

**Background** For patients with breast cancer, the quality of care following mastectomy should be designed with long-term goals to ensure the physical and psychosocial wellbeing of survivors. This study explores the impact of mastectomy on the quality of life of breast cancer survivors in the Gaza Strip.

**Methods** This cross-sectional study involved the only two oncology centres of the Gaza Strip. In total, 173 patients who had undergone mastectomy were chosen using convenience sampling. Upon their arrival at the oncology centres (a minimum of 3 months after mastectomy), the patients completed face-to-face questionnaires made up of five sections: sociodemographic data, physical, psychological, and social wellbeing, and family dynamics. Data were collected from August, 2015, to September, 2016. SPSS software (version 21) was used for data analysis. Ethics approval was obtained from the Palestinian Ministry of Health.

**Findings** The mean age at data collection was 51·0 (SD 10·0) years. In total, 73·0% (126 of 173) had low educational achievements (below secondary level), 91·0% (157) were unemployed, and 20·8% (36) had a first-degree relative with breast cancer. Two-thirds (133) had undergone radical mastectomy, and 17·0% (29) had breast-conserving surgery. Evaluation of the negative impacts of mastectomy showed that psychological wellbeing was the most affected domain (66·4%; 115), followed by physical wellbeing (52·2%; 90), social wellbeing (44·2%; 77), and family dynamics (49·2%; 85). Following mastectomy, 57·2% (99), 48·6% (84), and 42·8% (74) of patients experienced fatigue, early menopausal symptoms, and sleep disturbances, respectively. Feeling worried was the most common psychological complaint (52·6%; 91). Furthermore, 55·5% of patients (96) experienced financial impacts (eg, some mentioned that treatment expenses were drawn from very basic living and household funds), and 59·0% (102) had decreased day-to-day activity (physical activity for the household that would usually be carried out on a regular basis, such as chores). Interestingly, 95·4% (165) were worried about divorce owing to their surgery.

**Interpretation** The fear of divorce found in this study demonstrates the insecurity of women in society in Gaza. However, this study could not validate the reality of such fears (for example, determine the proportion of women who get divorced following mastectomy). Involving the patient's family in the treatment process is important to promote social wellbeing. Improving holistic medical care for survivors of breast cancer in the Gaza Strip is essential.

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### Contributors

EA, ME, and KE contributed to study design and development of the data collection sheet. EA, ME, IA, HA, EK, HB, and AH collected data. ME analysed data; ME and BB interpreted the data. EA wrote the Abstract. EA, ME, KE, and BB reviewed the Abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

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# Simple changes save lives: a multi-centre clinical audit of the management of trauma patients on arrival at the emergency room in the Gaza Strip, occupied Palestinian territory

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## Abstract

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**Background** The WHO trauma checklist reduces morbidity and mortality. This study evaluates adherence of three hospitals in Gaza to the basic WHO checklist standards in order to promote set standards of care.

**Methods** A multi-centre clinical audit was conducted at the three major hospitals in Gaza (Nasser Hospital, European Gaza Hospital, and Alshifa Hospital), which we refer to as hospitals A, B, and C. A prospective observational study was carried out to assess current trauma care practice and to compare this with the WHO trauma care checklist, which was used as a data collection sheet. A team member selected the sample prospectively and randomly from patients with trauma in the emergency department of each of the hospitals over a 3-month period (June to September 2017), and data were analysed using SPSS.

**Findings** In each hospital, 50 patients were included, with mean ages of 9·5 years (SD 4·1 years), 21·3 years (7 years), and 13 years (9 years) in hospitals A, B, and C, respectively. The majority of these patients were male; 38 out of 50 patients (76%) in hospital A, 44 of 50 patients (88%) in hospital B, and 37 of 50 patients (74%) in hospital C. Road traffic accidents were the most common cause of trauma in hospitals A and C, whereas falling from a height of 2 m or greater was the most common in hospital B. All patients reached the emergency room within 30 min, mainly by ambulance in hospital A (28 of 50 patients; 56%), whereas private cars were the most frequent type of transportation to hospital B (28 of 50 patients; 56%) and hospital C (30 of 50 patients; 60%). Pre-hospital care was provided by non-trained first responders in all cases. In the emergency room, airway devices and chest drains were provided in all cases when indicated, but intravenous fluids and oximeters were not always used. Intravenous fluids were used in 32%, 34%, and 60% of indicated cases in hospitals A, B, and C, respectively. Oximeters were used in 72%, 74%, and 76% of indicated cases in hospitals A, B, and C, respectively. All patients were checked for internal and external bleeding and pelvic fractures, with immobilisation when indicated. In hospitals A and B, urinary catheters were used in some cases despite no appropriate indication (for 8% and 16% of patients with no indication in hospitals A and B, respectively). In hospital C, urinary catheters were only used when indicated. The broader treatment plan was discussed with patients' families, with good communication with units to which the patients were referred after the emergency room. In the majority of cases (126 of 150 patients), the treatment plan was not documented on the patient's trauma chart.

**Interpretation** The findings show that adherence to trauma care standards and emergency room care provision vary by hospital. Areas requiring improvement include pre-hospital care and documentation on the patient's trauma chart. Universal use of the WHO checklist, a simple adaptable tool, should facilitate the necessary improvements, and a re-audit should be carried out after this improvement are made.

**Funding** None.

### Contributors

MF, designed the study. MF, YA, AQ, HB, and AB collected the data. MF did the data analysis. MF, YA, and BB wrote the abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

# Knowledge, attitudes, and practices relating to antibiotic resistance among pharmacists: a cross-sectional study in the West Bank, Palestine

Diala Abu Al-Halawa, Roudin Sarama, Ziad Abdeen, Radwan Qasrawi

## Abstract

**Background** Antibiotic resistance is an increasing problem worldwide. Inappropriate use of antibiotics, including suboptimal use, abuse, and dispensing errors substantially contributes to this problem. Dispensing antibiotics without medical prescription is a major contributing factor to antibiotic resistance. Pharmacists as health-care providers are, in many studies, considered accountable for this malpractice. However, in Palestine, little research has been carried out into their involvement in antibiotic resistance. Therefore, we aimed to study Palestinian pharmacists' knowledge, attitudes, and practices in relation to antibiotic resistance.

**Methods** A descriptive cross-sectional survey of Palestinian pharmacists was conducted in 2017. A convenience sample of 162 pharmacists was included in this study. The convenience sample was selected from the four main cities (Hebron, Ramallah, Nablus, and Bethlehem) of the West Bank. Subjects were selected based on their availability and accessibility, and there were no specific inclusion criteria. A self-administered questionnaire was developed as a data collection instrument. The questionnaire included five sections: demographic characteristics, practices, attitudes, knowledge, and potential interventions. Responses were given using a Likert scale and frequencies were recorded. There were also questions to which participants could respond with either "agree" or "disagree". Descriptive statistics, frequencies, percentages, and correlation tests were used to summarise and analyse the data.

**Findings** Of 162 questionnaires distributed, 155 (96.7%) were returned. Of the participants, 40.0% (62 of 155) had experience of 10 years or longer. Results indicated a significant association between pharmacists' experience and antibiotic practices. According to responses regarding practices, 77.0% (119 of 155) of pharmacists encountered unnecessary antibiotic prescriptions made by doctors. Furthermore, 82.6% (128 of 155) of pharmacists reported that patients demanded antibiotics without prescription, and 60.8% (94 of 155) of pharmacists reported dispensing antibiotics upon patient demand. In terms of knowledge, 53.2% (82 of 155) of pharmacists agreed with the statement that unnecessary dispensing of antibiotics is harmless, whereas 77.7% (120 of 155) thought that over-the-counter antibiotic purchases contribute to antibiotic resistance, and 89.2% (138 of 155) agreed that there is a need for antibiotic dispensing guidelines. Results of the knowledge scale reported that 35.5% (55 of 155) of pharmacists have a low level of knowledge regarding antibiotic use. Pharmacists were asked for potential interventions to which they would consent; 78.1% (120 of 155) agreed that restricting the use of antibiotics may help to contain antibiotic resistance, and 58.1% (90 of 155) responded that they would become participants in educational programmes regarding antibiotic resistance.

**Interpretation** This is the first study in Palestine to assess pharmacists' knowledge, attitudes, and practices in relation to antibiotic use and its relationship to microbial resistance. Our study indicated that patients demanding antibiotics without medical prescription is relatively common and is ascribed to patients' lack of information and knowledge regarding the relationship between antibiotic use and microbial resistance. Antibiotic dispensing is a problem in Palestine. The percentage of over-the-counter antibiotic purchases was found to be high compared to prescribed antibiotics, and there was a lack of information and knowledge about antibiotic resistance in the pharmacy community. An intervention programme for community pharmacists could be designed to improve the dispensing of antibiotics and to minimise resistance. Furthermore, the study highlights the need for intensive training and educational programmes to enhance community pharmacists' knowledge of antibiotic resistance.

**Funding** Al-Quds Public Health Society, Jerusalem, Palestine.

## Contributors

RQ and DAA-H contributed to the design and implementation of the research, to the analysis of the results and to writing of the Abstract. ZA and RS contributed to the design of the research. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Assessment of health-related quality of life among patients with hypertension: a cross-sectional study from Palestine

Samah W Al-Jabi, Sa'ed H Zyoud, Waleed M Sweileh, Aysha H Wildali, Hanan M Saleem, Hayat A Aysa, Mohammad A Badwan, Rahmat Awang

## Abstract

**Background** The ability to identify indicators of poor health-related quality of life (HRQoL) is crucial for both improving clinical care and determining targets of intervention for the prevention and treatment of disease. The main objectives of this study were to assess the HRQoL profile of individuals with hypertension in Palestine, and to determine the sociodemographic and clinical characteristics associated with poor HRQoL.

**Methods** A cross-sectional study was conducted, adopting the EuroQoL-5 Dimensions scale (EQ-5D-5 L) for the assessment of HRQoL. Patients with hypertension attending the outpatients' clinic at Al-Makhfyah primary health care clinic and from the outpatients' clinic at Alwatani Hospital, Nablus, Palestine, were approached for the study. The study was approved by the Institutional Review Board at An-Najah National University. Informed verbal consent was obtained from the participants before the start of the study.

**Findings** A total of 410 patients with hypertension were enrolled from the two centres (205 patients from each centre). Of these patients, 51.95% (213 of 410) were females. The average age of the study population was 58.37 (SD 10.65) years. The mean EQ-5D-5 L index value and EQ visual analogue scale (EQ-VAS) scores were 0.80 (SD 0.16) and 74.13 (15.62), respectively. There was a significant positive correlation ( $r=0.56$ ;  $p<0.001$ ) between the EQ-5D-5L index values and the reported EQ-VAS scores. Higher EQ-5D-5L index values were significantly associated with patients who were younger than 50 years, employed, married, with income higher than US\$500, who were university graduates, with a disease duration of less than 1 year, with or without one comorbid disease, and those taking 1–3 medications (Kruskal–Wallis test,  $p<0.05$ ), as well as with male gender and monotherapy (Mann–Whitney test,  $p<0.05$ ).

**Interpretation** The results highlight that specific sociodemographic and disease-related characteristics of patients with hypertension, as well as treatment factors, are strongly associated with HRQoL. The study findings may be helpful in clinical practice, particularly in the early treatment of such patients, at a point at which improvement of HRQoL is still possible.

## Funding None.

### Contributors

SWA conceived the study, led the study design, data analysis and interpretation, and drafted the Abstract. SHZ and WMS contributed to the conception of the study, participated in the study design, and revised the Abstract. AHW, HMS, HAA, and MAB interviewed the patients, participated in data interpretation and drafting of the Abstract. RA contributed to the conception of the study and revision of the Abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

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# Effects of the 10-year siege coupled with repeated wars on the psychological health and quality of life of university students in the Gaza Strip: a descriptive study

Khamis Elessi, Abdullah Aljamal, Loai Albaraqouni

## Abstract

**Background** Residents of the Gaza Strip live under severe and chronic conditions of strict siege. Many studies have reported that the residents experience physical and psychological insecurity, and that this is linked to frequent military attacks, lack of jobs, failing economic situations, and lack of hope for a better life. This study aimed to investigate the effects of such factors on the well-being of young people aged 18–24 years old.

**Methods** A descriptive study was carried out in October, 2017, using semi-structured interviews on a convenience and purposive sample of 600 male and female university students from the four main Palestinian universities in the Gaza Strip. Our research tools were the WHO Five Well-being Index (WHO-5), the Symptom-Checklist-27 (SCL-27), and the Gaza Stressful Situations Checklist. Ethics approval was obtained from the Helsinki Committee at the Ministry of Health. Informed verbal consents were obtained from participants prior to data collection.

**Findings** Of 600 students interviewed, 71·5% (429) completed all questions and were included in our analysis. The majority of our sample (90·2%; 540) were single and 54·0% (324) were female. In response to our questions, 83·0% (498) agreed with the statement that they had been negatively affected by the lack of electricity, and 67·0% felt that they were living in a big prison and are unable to travel for study abroad. In addition, 30·0% of participants (180) rated their quality of life as poor or very poor. More than 65·0% of students (390) did not have sufficient money to sustain their daily expenses, and 87·2% (522) had limited opportunities to enjoy leisure activities or daily life. Two-thirds of participants (450) felt sad, and 60·0% (360) felt hopeless about their future. Furthermore, based on a five-point Likert scale (never, seldom, sometimes, often, almost always), more than a third of our sample (35%; 210) reported that they had experienced suicidal thoughts sometimes or often.

**Interpretation** The majority of university students in Gaza feel imprisoned, unhappy, unsatisfied with their lives, hopeless, and powerless. This disturbing picture should alert political leaders, decision makers, and mental health specialists to study these phenomena more intensively. If these issues are not urgently addressed and resolved, they might lead to more serious mental and psychosocial consequences in the future that can negatively affect the national fabric in Gaza.

**Funding** None.

## Contributors

KE contributed to the study design and development of the data collection sheets, and wrote and reviewed the Abstract. AA contributed to the study design and development of the data collection sheets, collected data, and contributed to the writing of the Abstract. LA interpreted the results and reviewed the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

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# Induction of labour at Al-Helal Al-Emarati Maternity Hospital in the Gaza Strip: a clinical audit

Khaled Alkhodari, Bakr Abo-Jarad, Sadee Nkhala, Mohammed Elbelbessi, Bettina Bottcher

## Abstract

**Background** Labour induction is a commonly used obstetric procedure that has specific indications and may result in complications. This audit evaluated the adherence to the Palestinian Ministry of Health guidelines for labour induction at Al-Helal Al-Emarati Maternity Hospital in the Gaza Strip, and considered the implications.

**Methods** Data were collected retrospectively from patients' medical records at Al-Helal-Al-Emirati Maternity Hospital from Aug 25 to Oct 7, 2017, including all patients who underwent induction of labour. Local practice was compared to the Palestinian Ministry of Health guidelines. Patient confidentiality was maintained and ethics approval was obtained from the Palestinian Ministry of Health.

**Findings** In total, 101 patients were identified, with a mean age of 26·6 years (SD 5·3 years). The modified Bishop score was documented in 86% of women (87 of 101). The most frequent indication for induction was prolonged pregnancy (for 28% of women; 28 of 101). Of these women, 82% (23 out of 28) were induced at 41 or 42 weeks. Pre-labour rupture of membranes was the indication for induction in 25% of the cases (25 of 101). The prostaglandin misoprostol was used for induction in 99% of women (100 of 101), given orally as a 50 µg tablet in accordance with the Palestinian Ministry of Health guidelines. Cardiotocography was performed before and 1 h after misoprostol (in accordance with guidelines) in 43% of cases (43 out of 101), whereas 49% of women (49 out of 101) had cardiotocography only after misoprostol. Four women had cardiotocography only before misoprostol, three women had no cardiotocography, and documentation was missing for two women. Cervical evaluation was carried out before each dose of misoprostol (in accordance with guidelines) in 42% of women (42 out of 101). The mean duration between initiation of induction and delivery was 20·9 h (SD 21·94 h). Informed written consent for induction was obtained from three women, but none of the women were informed about the risks and benefits of induction.

**Interpretation** Adherence to local guidelines was poor, particularly with respect to the care that women received prior to and during induction, including cervical assessment and performance of cardiotocography. Further weaknesses were insufficient patient education combined with a lack of formal consent and poor documentation. These findings highlight deficiencies in involving patients in their care and decision making processes, which are widespread in the Gaza Strip. These results were shared with the team. Performance improvements are being implemented and a re-audit is planned to assess progress.

**Funding** None.

## Contributors

KA, SN, and BB conceived and designed the study. SN, ME, and BA collected and interpreted the data. BA analysed the data. KA wrote the Abstract. BB critically reviewed the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

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# Surgical site infections following gastrointestinal surgery in Palestine: a multicentre, prospective cohort study

Osaïd Alser, Haya Tahboub, Ibrahim Al-Slaibi, Yousef Abuowda, Mohamedraed Elshami, Loai Albarqouni, on behalf of Globalsurg 2 Palestine collaborators

## Abstract

**Background** Surgical site infection (SSI) is defined as operation-related infections that occur at or near surgical incisions within 30 days after surgery. SSI is the most common postoperative complication and leads to increased morbidity and mortality among surgical patients. In Palestine, prospective multicentre studies on the epidemiology of SSI are lacking. We aimed to describe SSI epidemiology following gastrointestinal surgery in Palestine.

**Methods** We used data from an international study (GlobalSurg 2), which is a prospective, multicentre cohort study. The 11 participating hospitals (four in the Gaza Strip and seven in the West Bank) provided a 30-day follow-up for consecutive gastrointestinal surgical operations performed during a 2-week period between Jan 1 and July 31, 2016, with the follow-up for the last period ending on Aug 30, 2016. 30-day follow-up data collection included incidence of SSI or other hospital acquired infection, any unexpected re-intervention and 30-day mortality. The primary outcome was the occurrence of SSI within 30 days of surgery, and secondary outcomes were 30-day postoperative mortality rate and administration of perioperative antibiotics. We used RedCap for data management, and SPSS for data analysis. Ethics approval was obtained from the Palestinian Ministry of Health.

**Findings** Data were included for 249 patients; 133 (53.4%) were male and the mean age was 29 years (SD 17). Of these individuals, 43 patients (17%) were current smokers, 13 (5%) had diabetes, and 197 (79%) were rated as healthy according to the American Society of Anaesthesiology classification. Of the operations, 142 (57%) were emergencies, 224 (90%) were clean-contaminated, 186 (75%) were open surgeries, and 144 (58%) involved appendectomy. Antibiotics were given preoperatively to 79 patients (32%) and at the point of incision to 128 (51%). In total, 24 patients (10%) developed SSI and 3 (1%) had an intra-abdominal or pelvic abscess. The average length of in-hospital postoperative stay was 3 days (SD 2.5). One patient (0.4%) died within 30 days of surgery (30-day mortality rate).

**Interpretation** We observed a low rate of SSI (10%) and 30-day postoperative mortality rate (0.4%) compared with other low-income and middle-income countries (SSI rate of 23.2% to 14.0%, 30-day postoperative mortality rate of 4.8% to 1.6%, for low-income to middle-income countries, respectively). This may be attributable to the fact that most of our cases were healthy and had clean-contaminated wounds. The results should be interpreted cautiously because of limited sample size and event rates.

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## Contributors

OA and ME collected, analysed and interpreted the data, and wrote the Abstract. HT, IA, and YA collected data and reviewed the Abstract. LA reviewed the Abstract and contributed to data analysis and interpretation. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Dietary habits, energy drink consumption, obesity, and physical activity in marginalised Palestinian schools in the West Bank: a cross-sectional study

Sami Amer, Elham Kateeb, Abdullah Hassan, Fidah Musa

## Abstract

**Background** Socioeconomic factors have been found to be related to adolescents' dietary habits, physical activity, and body mass index (BMI). 50 schools in the West Bank that face socioeconomic and political challenges in terms of infrastructure, academic achievement, dropout rate, limited access, geography, and economic status were labelled as marginalised by the AMIDEAST School Support Program (SSP). This study aimed to describe and assess factors relating to dietary habits, energy drink consumption, BMI index, and physical activity in Palestinian adolescents attending marginalised schools.

**Methods** Marginalised schools (n=50) were stratified by district and gender to select a random sample of 20 schools. All students in sixth or ninth grades in the targeted schools were interviewed one-to-one by one of 14 senior dental students who were trained and calibrated by a public health specialist. The schoolchildren were asked about their dietary habits, such as daily consumption of added sugar, carbonated drinks, sweetened juices, and energy drinks. Daily intake of milk, fruits, vegetables, nuts, and non-vegetarian food were also assessed. In addition, schoolchildren's physical activity, father's employment and mother's education were recorded. Weight and height were measured, and BMI percentile was calculated. Parental informed consents were collected by the school administration. Ethics approval for the study was obtained from Al-Quds University Scientific Research Ethics Committee.

**Findings** A total of 1282 students out of 1308 completed the questionnaire; a response rate of 98%. Of our sample, 6% (77 of 1282) were underweight (5th percentile or under) and 34% (436 of 1282) were overweight or obese (85th percentile or over). Among sixth graders, 43% (155 of 360) of the boys and 24% (59 of 247) of the girls were overweight or obese. The opposite was true for ninth graders; 20% (54 of 268) of the boys and 42% (158 of 377) of the girls were overweight or obese. Ninth graders had more added sugar in their diet than sixth graders ( $p=0.002$ ), less milk consumption ( $p<0.0001$ ), more energy drink consumption ( $p=0.001$ ), and less physical activity ( $p<0.0001$ ). Consumption of carbonated and sweetened drinks was associated with being overweight or obese ( $p=0.016$ ,  $p=0.001$ ). Consumption of carbonated drinks was higher among children of mothers with a high-school education than among children of mothers with college degrees ( $p<0.0001$ ). In addition, children of mothers educated to high school level or below were associated with being underweight ( $p=0.05$ ).

**Interpretation** The results of this study suggest that dietary habits worsen between the ages of 12 years and 15 years. The mother's level of education is an important factor in being overweight or underweight. Interventions to increase awareness of the importance of healthy diets and physical activity among adolescents and their mothers should start before the age of 12 years.

**Funding** AMIDEAST School Support Program (SSP).

## Contributors

SA contributed to the study design, literature review, data collection, and drafting of the Abstract. EK contributed to the study design, data collection, data analysis, and interpretation of data. AH contributed to data collection and data entry. FM contributed to the study design and data collection. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# The epidemiological characteristics and visual outcome of open globe eye injuries in Palestine: a retrospective chart review study

Murad Y Amro

## Abstract

**Background** In Palestine, there are frequent eye injuries but there is a scarcity of studies—data on prevalence, causes, risk factors, and the visual outcomes are inadequate. This study aimed to describe the magnitude, causes, burden, and visual outcomes of open globe eye injuries in Palestine, and to identify people at risk through distribution analysis of the injured patients by age, sex, and area of residency.

**Methods** A descriptive cross-sectional study was carried out, based on a review of all 413 patient files of cases of open globe eye injury undergoing surgical repair at St John Eye Hospital, Jerusalem, between January, 2000, and December, 2005. Ethics approval was obtained from the St John Eye hospital Ethical Committee.

**Findings** Patients were from all of the districts of Palestine. The mean age of the injured patients was 16·5 years (SD 14·1), with males comprising 82% of the study population. The eye injuries were analysed in three groups. Injuries in preschool children (age 1–6 years) formed 28% of cases (116 of 413); the school-age group (age 7–18 years) was the largest category (39% of cases; 161 of 413); and the adult group (19 years and older) accounted for 33% of cases (136 of 413). For the school-age group, 15% (62 of 161) of eye injuries took place outdoors. Accidents accounted for 21% (35 of 161) of injuries in the group, whereas 12% (20 of 161) occurred owing to violence (for example, personal quarrels with injuries caused by fists, nails, sticks, and stones), and 12% (19 out of 161) were related to the second intifada (for example, due to rubber bullets, gun shots, explosions, and shrapnel from military action). For the adult group, 51% of eye injuries (69 of 136) occurred in the workplace, 21% (29 of 136) were caused by intifada, 14% (19 of 136) were caused by violence, 8% (11 of 136) occurred by accidents, and 6% were from unknown causes. Visual outcomes were measured after best correction (with surgery and with glasses); 21% (85 of 413) of all patients were left with a visual impairment, 21% (87 of 413) became blind, and 11% (47 of 413) lost an eye.

**Interpretation** Open globe eye injuries in Palestine have serious consequences, including visual impairment, blindness, and removal of the injured eye. However, this substantial impact on the patients' quality of life might be prevented by simple safety measures, legislative policies, and regulations. This study is cross-sectional in design and based on file abstraction; further studies should consider visual outcomes and preventive measures to minimise the risk of eye injuries.

**Funding** None.

## Contributors

MYA designed the study, collected, analysed and interpreted data, and wrote the Abstract.

## Declaration of interests

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# Quality of data in death notification forms in the Gaza governorate: a descriptive study

Huda Haidar Anan, Khaled Abu Saman, Nashwa Skaik, Ali Abu Ibaid, Mahmoud Daher, Rand Salman

## Abstract

**Background** The Cause of Death Registry data are derived from death notification forms (DNFs). These data are used to formulate mortality statistics that are used in the development of health systems and in public health planning. This study assessed the quality of registered data in DNFs in Gaza to form a basic understanding of the current situation, and with a view to providing evidence-based recommendations to improve data quality.

**Methods** In 2016, the Ministry of Health issued 4861 DNFs in the Gaza governorate. A representative sample of 509 DNFs was selected using proportional systematic random sampling. A set of indicators was identified using the WHO guidelines for DNF data quality assessment. 13 data items were identified to represent administrative data plus nine items to represent medical data, and a total score for completeness was calculated. The quality of medical data was examined by a doctor trained to analyse the quality of mortality data. Administrative approval was obtained from the Ministry of Health. The assessment did not include any personal data (and all data were anonymous).

**Findings** The completeness of administrative and medical data was 89·0% (5500 of 6180) and 47·3% (2168 of 4581), respectively. For the underlying cause of death, completeness was 36·5% (186 of 509). The completeness of ICD-10 coding was 46·8% (238 of 509) for the direct cause of death and 12·6% (64 of 509) for the underlying cause. Only 23·0% (three of 13) of DNFs for women of reproductive age indicated whether the woman was pregnant or not and whether her death was related to maternal health problems. The ICD-10 codes with the written cause of death were checked and the ICD-10 documentation was correct in 58·0% (138 out of 238) of DNFs for the direct cause of death and 67·2% (43 out of 64) of DNFs for the underlying cause of death.

**Interpretation** The completeness and accuracy of medical data in DNFs is low. There is an urgent need to train physicians and medical interns to give the correct death sequence and ICD-10 codes, particularly for the underlying cause of death.

**Funding** None.

### Contributors

HHA, KAS, and NS designed the study, carried out data management, data entry and interpretation, and wrote the Abstract. MD, RS, and AAI reviewed the study findings and the Abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

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# Exploring communication in the care for children with cancer in Palestine: an ethnographic qualitative case study approach

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## Abstract

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**Background** There has been little research in the Middle East regarding communication in the care for children with cancer. Findings of studies undertaken in diverse cultural settings show that health-care providers report being poorly prepared to communicate with children with cancer and feel inadequately prepared to support families facing loss. The Arab culture differs in numerous ways from western culture (eg, with regard to disclosing prognosis information to children). Therefore, this study explores the experiences of children, families, and health professionals in communication in the care of children with cancer in Palestine.

**Methods** This study used an ethnographic qualitative case study approach. It was conducted in one oncology unit based in the West Bank. Two data collection methods were employed: participant observation and semi-structured interviews. Ethics approval was obtained from the hospital ethical review board. Informed written consent was obtained from all participants (or legal guardians, in the case of children).

**Findings** 70 hours of observation were undertaken and 35 interviews were conducted, involving five physicians, 11 nurses, six children aged 6–18 years, seven mothers, and six grandmothers. Although a few parents completely hid the diagnosis of leukaemia from their children, others tried to relieve the situation by informing their children of different diagnoses, such as a blood infection. The term cancer was avoided in the discussion of the disease by health-care providers and parents to ameliorate the negative effect of this term. The observational data showed that the children were not involved in discussions relating to their disease, and most communication about their illness was between their parents and physicians.

**Interpretation** The findings reveal the challenges that physicians, nurses, grandmothers, and mothers face in communicating with children with cancer. Each group reported a need to improve their communication skills with children with cancer. Strategies are needed to involve children in communication regarding their disease and their prognosis.

**Funding** None.

### Contributors

MA, BC, and IB contributed to the conception and design of the study, acquisition of data, analysis and interpretation of data, and drafting and critical revision of the Abstract for important intellectual content. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

# The quest to expand the coverage of public health insurance in the occupied Palestinian territory: an assessment of feasibility and sustainability using a simulation modelling framework

Sameera Awawda, Mohammad Abu-Zaineh, Bruno Ventelou

## Abstract

**Background** In their quest for universal health coverage (UHC), many developing countries explore alternative financing strategies to address the potential budgetary impact of health coverage expansion (for example, deferred debt versus current finance through taxation or premiums). Given the limited fiscal space, these policies may have different implications for fiscal sustainability and may worsen intergenerational inequality.

**Methods** We assessed the impact of UHC on fiscal sustainability and intergenerational inequality using an overlapping generations model within a general equilibrium framework, which we calibrate using data from the Palestinian Expenditures and Consumption Survey (PECS-2011) and the Social Accounting Matrix (SAM-2011). Fiscal sustainability is assessed using a prudent debt–GDP level of 39%. Intergenerational inequality induced by different policies is assessed by comparing the relative incremental burden (RIB) borne by each generation following the policy adjustment.

**Findings** In the absence of any policy adjustment, an ad hoc expansion of health coverage would increase the debt–GDP level to 15% above the prudent level. This indicates that the UHC fiscal stance may be financially unsustainable in the long run, therefore calling for a policy adjustment. Among the policies we examined, UHC finance through the increase of premiums (whether current or deferred) seems to be unsustainable and may further widen intergenerational inequality ( $RIB \in [3,6]$ ). By contrast, current finance through indirect taxes helps to restore a prudent debt–GDP level and seems to be associated with a lower level of intergenerational inequality than deferred-debt finance through direct taxation (RIB of 1.25 and 5, respectively).

**Interpretation** Among the policy options assessed, the current indirect taxation emerged as the best policy option in terms of its impact on both fiscal sustainability and intergenerational inequalities. However, from a policy perspective, the capacity of governments to raise additional revenues might be constrained in the short-term. Under such circumstances, deferred-debt finance may be preferred—a situation in which policy makers may have to trade fiscal sustainability against intergenerational inequality.

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## Contributors

SA prepared the data, conceived the framework for the study and carried out data analysis. MA-Z developed the framework for the study, carried out data analysis and wrote the Interpretation section. BV developed the framework for the study. All authors have seen and approved the final version of the Abstract for publication.

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# Safety and efficacy of different prostaglandins used at term pregnancy for labour induction: a comparative study

Haly Zourob, Khaled Abu El Aish

## Abstract

**Background** Prostaglandins are commonly used for labour induction in obstetric practice. Given the harsh effects of occupation and siege on provision of health care and on economic conditions, this study was conducted to compare the efficacy and safety of oral misoprostol and vaginal dinoprostone, to find the more appropriate and economic drug for labour induction in the Gaza Strip, occupied Palestinian territory.

**Methods** In this case-control study, we screened medical files of 155 women undergoing labour induction at Al-Helal Al-Emirati Hospital, Rafah, in the Gaza Strip. Inclusion criteria were singleton, cephalic presentation, and full-term pregnancies (40 weeks) needing labour induction. Patient files were divided into two groups according to the drug regimen. 76 women received 50 µg oral misoprostol for parity 0–4 or 25 µg for parity 4 or greater, every 6 hours. 79 women received dinoprostone vaginal tablets, with a dose of 3 mg then 1.5 mg for nulliparous women and 1.5 mg for parity 1 or greater, every 8 hours. There were no significant differences between the misoprostol and dinoprostone groups in terms of mean age (25.07 [SD 5.66] vs 27.86 [6.56] years,  $p=0.34$ ), mean gestational age (279.43 [SD 11.41] vs 285.57 [SD 15.50] days,  $p=0.81$ ), and mean parity (2.10 [SD 1.97] vs 2.73 [SD 2.64],  $p=0.05$ ). Outcome measures were induction success, induction–delivery interval, number of used drugs and doses, caesarean section rate, and maternal complications. Data were analysed with SPSS software. We compared outcomes using the Mann–Whitney U-test, student's *t*-test, or chi squared test. A *p* value of less than 0.05 was considered significant. The study was approved by the Helsinki Committee, Gaza Strip.

**Findings** Induction of labour succeeded in 80% (61 of 76) and 78% (62 of 79) cases ( $p=0.492$ ) in the misoprostol and dinoprostone groups, respectively. There was no significant difference between the misoprostol and dinoprostone groups in the induction–delivery interval (15.2 h vs 16.4 h,  $p=0.625$ ). The number of doses required was 2.2 and 1.8 in the misoprostol and dinoprostone groups, respectively ( $p=0.070$ ). The caesarean section rate did not differ significantly between the misoprostol and dinoprostone groups (7.9% [six of 76] vs 10.1% [eight of 79],  $p=0.369$ ). In addition, complications (mild vaginal bleeding, post-partum haemorrhage, and puerperal fever) also did not differ significantly between the misoprostol and dinoprostone groups (37.7% [23 of 76] vs 33.9% [21 of 79],  $p=0.430$ ), and all were mild.

**Interpretation** Oral misoprostol and dinoprostone vaginal tablets have the same safety and efficacy. Misoprostol is a good alternative for induction of labour.

**Funding** None.

## Contributors

HZ contributed to the study procedure, conceptualization of the study, study design, and revision of the Abstract. KAEA contributed to the conceptualisation of the study, study design, data collection, data input for analysis, data analysis, data management, and writing and revision of the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Prevalence of obesity and overweight in Palestine: a systematic review

Khamis Elessi, Loai Albaraqouni

## Abstract

**Background** Overweight and obesity are increasing at an alarming rate in developed countries and developing countries like Palestine. Obesity (body mass index [BMI]  $\geq 30$ ) and overweight (BMI 25.0–29.9) predispose to several non-communicable diseases (NCDs) such as diabetes, hypertension, and cardiovascular diseases. Obesity prevalence studies in different age groups and locations across Palestine are very varied in their methods, participants, settings, or results. We aimed to assess the prevalence of obesity and overweight among children (18 years of age and under), adults (over 18 years of age), and people with NCDs in Palestine.

**Methods** We conducted a systematic search and review of literature in PubMed, Embase, Scopus, CINAHL, and the Cochrane Library (from inception to Dec 3, 2016) for articles reporting obesity or overweight prevalence among Palestinians. We included all original, population-based studies, irrespective of their design or publication status, language, or age of participants. Studies were included if they used BMI, waist circumference, or waist–hip ratio as their measurement tool. Two authors independently screened titles, abstracts, and full texts for eligibility, then extracted relevant data and assessed the risk of bias. We pooled prevalence estimates of obesity and overweight using random effect models and reported the prevalence (with 95% CI) for children, adults, and people with NCDs separately.

**Findings** Of 773 citations retrieved, we included 38 eligible articles. The pooled prevalences of obesity and overweight were 6% (range 4–10%;  $P=98\%$ ) and 15% (13–17%;  $P=92\%$ ) in children; 18% (11–29%;  $P=98\%$ ) and 30% (24–38%;  $P=97\%$ ) in adults; and 49% (35–64%;  $P=98\%$ ) and 40% (31–50%;  $P=96\%$ ) in people with NCDs. All studies had a moderate to high risk of bias, especially selection bias. Most studies had incomplete reporting of STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist items, especially for source of bias (95%), study limitations (60%), and funding (80%).

**Interpretation** The prevalences of obesity and overweight in Palestine are high compared with those of some other developing nations, such as Tunisia, especially among adults and people with NCDs. However, the results should be interpreted cautiously in light of the high heterogeneity encountered in most studies. Our findings suggest that strategies are required to reduce obesity, and future research needs to identify the most effective interventions for combatting obesity in Palestine.

**Funding** None.

### Contributors

KE designed the study and protocol, developed the data collection sheet, collected data, and wrote and reviewed the Abstract. LE designed the study, developed the data collection sheet, and interpreted and reviewed the Abstract). All authors have seen and approved the final version of the abstract for publication.

### Declaration of interests

We declare no competing interests.

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# Carbapenem-resistant Gram-negative bacteria isolated from poultry samples: a cross-sectional study

Abdelraouf A Elmanama, Mariam R Al-Reefi, Madleen A Shamali, Haya I Hemaid

## Abstract

**Background** Gram-negative bacteria are a common cause of human infections and can be transmitted through food handling and food consumption. Infection with carbapenemase-producing Gram-negative bacteria is becoming a worldwide threat, and is hard to cure because the broad-spectrum carbapenem antibiotics are considered a last resort for treatment. This research aimed to determine carbapenem resistance among Gram-negative bacteria from poultry samples.

**Methods** Samples from chicken litter, water, chicken feed, and intestinal content (220 samples in total) were collected during 2017 from representative slaughter houses, farms, and homes from four different randomly selected locations in the Gaza Strip. Samples were cultured and all isolates were identified using conventional techniques. The Clinical and Laboratory Standards Institute disk diffusion method was used to determine antimicrobial susceptibility to 15 antimicrobial agents. Carbapenemase was detected by the modified Hodge test. The multiple antibiotic resistance (MAR) index for each isolate was also calculated. Permission was obtained from the Ministry of Agriculture, and verbal consent was obtained from owners of the establishments.

**Findings** *Escherichia* species were the most frequently isolated bacteria (48 of 122; 39%), followed by non-lactose fermenting *Enterobacteriaceae* (36 of 122; 30%) and other lactose fermenting *Enterobacteriaceae* (32 of 122; 26%). The lowest frequency was for non-fermenting Gram-negative bacilli (six of 122; 5%). Most isolates were resistant to most antimicrobial agents tested except for meropenem and amikacin (3% were resistant to meropenem and amikacin), and 41 isolates (34%) were resistant to imipenem. From 122 tested isolates, 42 carbapenem-resistant isolates (36%) were detected. There was no significant difference in resistance to carbapenem or other drugs among isolates from the four locations. None of the three meropenem-resistant isolates and only five of the 41 imipenem-resistant isolates (12%) were positive for carbapenemase production. Most of the tested isolates (115 of 122 isolates; 94%) were resistant to five or more of the tested antimicrobials, and were regarded as multi-drug resistant according to MAR index results.

**Interpretation** Resistance to carbapenems as well as to other antimicrobials was high, as indicated by the MAR index. This might be due to the lack of regulation of the use of antimicrobials in poultry. The responsible authorities should take note of these findings and implement an immediate antimicrobial resistance monitoring programme for poultry. Cross-contamination prevention measures should also be promoted and implemented.

**Funding** None.

### Contributors

MASH and HIH collected samples and performed laboratory work. MRA analysed the data. AAE supervised the study, analysed the data and wrote the Abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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# Socio-demographic and economic determinants of overweight and obesity in preschool children in Palestine: analysis of data from the Palestinian Multiple Indicator Cluster Survey

Yousuf Elmokhallalati, Heba FarajAllah, Loai Albarqouni

## Abstract

**Background** Obesity is a global public health issue and worldwide rates of childhood obesity are ten times higher than 40 years ago. A limited number of studies have been conducted to determine the prevalence of preschool obesity and overweight and associated factors in Palestinian children. The aim of this study was to examine sociodemographic and economic factors associated with preschool overweight and obesity in Palestinian children younger than 5 years of age.

**Methods** We used data from the fifth Palestinian Multiple Indicator Cluster Survey (MICS5), a cross-sectional survey of a representative sample of Palestinian households in 2014. The analysis was based on 6853 children (after excluding children whose z-score was out of range or not measured) below 5 years of age (46% [3152 out of 6853] in the Gaza Strip and 54% [3701 out of 6853] in the West Bank), drawn from 7816 completed surveys of a multi-stage cluster sample (99% response rate). The z-scores for BMI-for-age of children were used to evaluate weight status. Underweight, overweight, and obesity were defined as the proportion of preschool children with z-score values of 2 SDs or less, greater than 2 SDs, and greater than 3 SDs, respectively, from the WHO Child Growth Standards. Covariates included gender, age, area and region, number of children per household, mother's level of education, marital status of the mother, mother's age at birth, and wealth quantile (which we used as a composite indicator of wealth, with the first quintile representing the poorest households, and the fifth quintile representing the wealthiest households). We used multiple logistic regression analysis to estimate adjusted odds ratios (AORs) with 95% confidence intervals (CIs).

**Findings** The overall prevalence of overweight and obesity in Palestinian children (birth to 5 years) was 8·8% (95% CI 8·1–9·4); 7·3% were overweight and 1·5% were obese. The prevalence of underweight was 1·4%. The odds of overweight and obesity were lower among children in the Gaza Strip than in the West Bank (AOR=0·74; 95% CI 0·61–0·90). Girls were less likely to be obese and overweight than boys (AOR=0·75; 95% CI 0·63–0·89). Children under 4 years of age had a higher risk of being obese and overweight than children aged 4–5 years. Children who lived in the wealthiest households (fifth quintile) were more likely to be overweight and obese than children in the poorest (first) quintile (AOR=1·36; 95% CI 1·09–1·71).

**Interpretation** The prevalence of obesity and overweight among preschool children in Palestine (8·8%) is higher than the global prevalence (6·7%; derived using the same standardised method as in this study, and using the WHO Child Growth Standards to assess the nutritional status of children). Obesity and overweight were more likely to affect children from wealthier households, children from the West Bank, boys, and younger children. Excessive weight gain in early childhood is a strong predictor of adulthood obesity. Routine assessment of all children needs to become standard clinical practice from very early childhood. Effective management and preventive interventions are needed to tackle the increasing obesity problem in preschool children.

**Funding** None.

## Contributors

YE, HF, and LA designed the study, and contributed intellectually to the writing and revision of the Abstract. YE conducted the statistical analysis. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Socio-demographic and economic determinants of overweight and obesity in preschool children in Palestine: analysis of data from the Palestinian Multiple Indicator Cluster Survey

Yousuf Elmokhallalati, Heba FarajAllah, Loai Albarqouni

## Abstract

**Background** Obesity is a global public health issue and worldwide rates of childhood obesity are ten times higher than 40 years ago. A limited number of studies have been conducted to determine the prevalence of preschool obesity and overweight and associated factors in Palestinian children. The aim of this study was to examine sociodemographic and economic factors associated with preschool overweight and obesity in Palestinian children younger than 5 years of age.

**Methods** We used data from the fifth Palestinian Multiple Indicator Cluster Survey (MICS5), a cross-sectional survey of a representative sample of Palestinian households in 2014. The analysis was based on 6853 children (after excluding children whose z-score was out of range or not measured) below 5 years of age (46% [3152 out of 6853] in the Gaza Strip and 54% [3701 out of 6853] in the West Bank), drawn from 7816 completed surveys of a multi-stage cluster sample (99% response rate). The z-scores for BMI-for-age of children were used to evaluate weight status. Underweight, overweight, and obesity were defined as the proportion of preschool children with z-score values of 2 SDs or less, greater than 2 SDs, and greater than 3 SDs, respectively, from the WHO Child Growth Standards. Covariates included gender, age, area and region, number of children per household, mother's level of education, marital status of the mother, mother's age at birth, and wealth quantile (which we used as a composite indicator of wealth, with the first quintile representing the poorest households, and the fifth quintile representing the wealthiest households). We used multiple logistic regression analysis to estimate adjusted odds ratios (AORs) with 95% confidence intervals (CIs).

**Findings** The overall prevalence of overweight and obesity in Palestinian children (birth to 5 years) was 8.8% (95% CI 8.1–9.4); 7.3% were overweight and 1.5% were obese. The prevalence of underweight was 1.4%. The odds of overweight and obesity were lower among children in the Gaza Strip than in the West Bank (AOR=0.74; 95% CI 0.61–0.90). Girls were less likely to be obese and overweight than boys (AOR=0.75; 95% CI 0.63–0.89). Children under 4 years of age had a higher risk of being obese and overweight than children aged 4–5 years. Children who lived in the wealthiest households (fifth quintile) were more likely to be overweight and obese than children in the poorest (first) quintile (AOR=1.36; 95% CI 1.09–1.71).

**Interpretation** The prevalence of obesity and overweight among preschool children in Palestine (8.8%) is higher than the global prevalence (6.7%; derived using the same standardised method as in this study, and using the WHO Child Growth Standards to assess the nutritional status of children). Obesity and overweight were more likely to affect children from wealthier households, children from the West Bank, boys, and younger children. Excessive weight gain in early childhood is a strong predictor of adulthood obesity. Routine assessment of all children needs to become standard clinical practice from very early childhood. Effective management and preventive interventions are needed to tackle the increasing obesity problem in preschool children.

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## Contributors

YE, HF, and LA designed the study, and contributed intellectually to the writing and revision of the Abstract. YE conducted the statistical analysis. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Sociocultural factors in access to contraception by Palestine refugees in Jordan: a qualitative study

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## Abstract

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**Background** Maternal mortality rates in Palestine refugees in Jordan increased by 16% between 2013 and 2016. Action is needed to prevent future maternal deaths. Risk factors for maternal mortality are a young mother (below 20 years of age) and pregnancies that are close together (interval of less than 18 months), which can be prevented through the use of contraception. Contraceptive discontinuation rates increased among Palestine refugees in Jordan by 3% between 2015 and 2016. Sociocultural factors are important in access to contraception. This study assesses sociocultural barriers and opportunities to accessing contraception among Palestine refugees in Jordan.

**Methods** Focus group discussions were conducted in June, 2017, with female and male patients and health-care workers in rural and urban communities in Jordan. Patients were selected using opportunistic sampling at health centres; health centres and health-care workers were selected using purposive sampling. Only participants who signed the informed consent form were included. Discussions were moderated by a local researcher, tape-recorded, transcribed, translated, and analysed with MaxQDA. Analysis was conducted by two researchers independently using predetermined and emergent themes. Approval was obtained from the UNRWA Ethics Office.

**Findings** 12 discussions were conducted with 84 participants, seven participants per discussion; 40 females, 27 males, and 17 health workers with an age range of 18–67 years. Perceived barriers to accessing or using contraception included husband or family-in-law opposition to contraception use; preferences in terms of the sex of children; pride in having many children; fear of infertility; incorrect use of contraception; a lack of health-care workers to provide contraception; reluctance of staff to provide contraception to females without spousal consent; and costs involved in using contraception. Perceived benefits included the financial advantage of a smaller family; and birth spacing for women's mental and physical health.

**Interpretation** Despite the use of opportunistic sampling, this study shows that both sociocultural barriers and benefits to accessing contraception exist for Palestine refugees in Jordan. More resources are needed to improve access by further researching sociocultural dynamics related to contraception use.

**Funding** Share-Net International, Royal Tropical Institute (KIT), the Netherlands.

### Contributors

NG designed the study, collected, analysed, and interpreted data, carried out data management, and wrote the Abstract. IO analysed and interpreted data, and revised the Abstract. IA collected data, contributed to data analysis, and revised the Abstract. MD collected data and revised the Abstract. MH contributed to data analysis and revised the Abstract. AS revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

AS is the director of the Health Department at UNRWA Headquarters. MH is an employee of the UNRWA Health Department. We declare no other competing interests.

# Improvements in economic, social, and food security outcomes of Palestinian refugee women and diet diversity of Palestinian schoolchildren in Lebanon: the Healthy Kitchens, Healthy Children intervention

Hala Ghattas, Zeina Jamaluddine, Jowel Choufani, Amelia R Masterson, Nadine R Sahyoun

## Abstract

**Background** Palestinian refugees living in Lebanon continue to face social and economic exclusion that hinders their ability to improve their living conditions and livelihoods. This study aimed to investigate the effect of a two-pronged intervention that employed women through social enterprises to deliver a subsidised healthy daily school meal to elementary schoolchildren in Palestinian camps.

**Methods** We established two healthy kitchens in community-based organisations in Palestinian camps; these kitchens employed 32 women to provide daily meals to children attending primary schools. We used mixed methods to assess the effect of participating in the intervention on the women's economic, social, and food security outcomes. We also assessed the impact of the subsidised meal programme on children's dietary diversity, nutritional status, school absenteeism, and achievement in two intervention schools, compared to two control schools. Difference-in-difference and regression analyses were conducted to examine the associations between participation and outcomes, controlling for potential confounders. Quantitative and qualitative data analyses were conducted using Stata 13.0 and NVivo 10, respectively. Written informed consent was obtained from women and parents, followed by assent from children prior to participation. All study protocols were approved by the Institutional Review Boards of the American University of Beirut and the University of Maryland.

**Findings** At baseline, women's median household expenditure was US\$169 per capita per month. Additional income due to the intervention was equivalent to US\$110 per month, which translated into increases in total household and food expenditures ( $p=0.040$ ), as well as a reduction in food insecurity ( $p=0.006$ ). Qualitative data found improvements in morale, social support, and decision making. There were 648 children in the control group, and in the meal programme group there were 260 children with low participation (LP; participated less than 50% of total school days) and 454 with high participation (HP; participated more than 50% of total school days). There was a significantly greater increase in overall diet diversity score ( $\Delta 0.32$ ,  $p=0.0060$ ) and dairy consumption (odds ratio 1.2, 95% CI 1.1–1.3) in the HP group compared to controls. Both LP and HP groups were more likely to consume proteins, and less likely to consume sweetened beverages and desserts than controls. Furthermore, the HP group had a significant increase in haemoglobin ( $p=0.05$ ) and both LP and HP groups had a significant decrease in school absenteeism ( $p=0.04$ ) compared with controls.

**Interpretation** This study provides evidence of the positive effect of the Healthy Kitchens, Healthy Children model on economic, food security, and social outcomes of marginalised women, as well as diet diversity, haemoglobin, and school outcomes of children. This intervention contributed to human capital gains in two generations of protracted refugees.

**Funding** The Nestle Foundation for the Study of Problems of Nutrition in the World.

### Contributors

HG and NRS designed the study. ARM, JC, and ZJ conducted the field research under the supervision of HG. ZJ analysed the data. ZJ, HG, and NRS drafted the Abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

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# Follow-up survey of oral health status of children enrolled in UNRWA schools: a cross-sectional study

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## Abstract

**Background** The United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) School Health Programme provides preventive oral health services to school students through regular dental screening of new entrants and fourth and seventh grade students, in addition to the health education activities and treatment of decayed teeth provided by dental surgeons in health centres and by mobile dental teams. The main focus of UNRWA oral health services continues to be prevention rather than treatment. The objective of this follow-up survey was to calculate decayed, missing, and filled teeth (DMFT), and decayed, missing, and filled surfaces (DMFS) indices among seventh grade UNRWA schoolchildren in all five areas in which UNRWA operates (Gaza, Jordan, Lebanon, Syria, and West Bank), and to compare the results of this survey globally, locally and with a previous survey conducted in 2010 and 2011.

**Methods** A cross-sectional survey was conducted by calibrated examiners between March, 2016, and May, 2016. Two-stage sampling was used, with schools selected during the first stage and classes selected in the second stage. The sample size was calculated based on the number of students registered in each area. The confidence level was 95%, power 80%, and precision 5%. A total of 1550 children participated (100% response rate), 383 in Jordan, 390 in Lebanon, 340 in West Bank, and 437 in Gaza. All participants provided verbal informed consent. Data were analysed using Epi Info 7. Multiple logistic regression was used to analyse caries experience, prevalence of caries, and the most relevant behavioural and sociodemographic indicators. A p value of less than 0.05 was considered statistically significant.

**Findings** The prevalence of dental caries among examined children was 72.8% (1129 of 1550; 95% CI 70.5–75.0); the highest prevalence was in the West Bank (79.7%; 271 of 340) and lowest was in Jordan (68.4%; 262 of 383). The prevalence of untreated decayed surfaces was 69.4% (1076 of 1550; 95% CI 67.0–71.7); the highest prevalence was in the West Bank (76.8%; 261 of 340) and lowest was in Jordan (64.0%; 245 of 383). The percentage of children with one or more sealed permanent teeth was 9.8% (8.4–11.4), compared with 6.8% in 2011, and with wide variation between areas; the highest prevalence was in Lebanon (31.5%), while in Gaza and the West Bank the prevalence was less than 2.0%. The percentage of children who did not use a toothbrush and toothpaste was 19.1%, compared with 22.0% in 2011. The percentage of children who cleaned their teeth after every meal was 59.3% (919 of 1550), compared with 31.6% in 2011. Overall, 18.3% (284 of 1550) of children had never attended a dentist, and 83.1% (1289 of 1550) had experienced toothache in the past. In the total sample, 66.0% (1022 of 1550) of children were used to drinking soft drinks during meals. This habit was less frequent in Gaza (37.5%; 164 of 437) than in Jordan (71.1%; 272 of 383), the West Bank (75.0%; 255 of 340), and Lebanon (75.0%; 292 of 390).

**Interpretation** The prevalence of dental caries remains very high in Palestinian refugee school children, of whom only 27.2% are free of caries. The high percentage of untreated dental caries and the low percentage of sealed teeth call for increased efforts, refinement, and completion of the preventive strategies of the UNRWA. The main behavioural factors relating to the prevalence and severity of caries were frequency of sugar intake between meals and soft drink consumption.

**Funding** None.

## Contributors

MH wrote the Abstract. AK designed the study. AM, AO, AN, HD, IB, ZS, AA, MS, and MHS carried out data collection. AS supervised the study. PDC and LB carried out data analysis and interpretation. MAA and CZ trained and calibrated the data collectors. GC supervised the study. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Knowledge, opportunities, challenges, and the way forward for reproductive health rights: a qualitative study of women in the Bethlehem area of the West Bank

Yara Hadweh

## Abstract

**Background** Reproductive health rights were declared as fundamental human rights at the International Conference on Population and Development in Cairo in 1994, and at the Fourth World Conference on Women in Beijing in 1995. Acknowledgment of the importance of these rights was a momentous event for reproductive health. In the Palestinian context, reproductive health rights are severely affected by the political system and cultural context. There has been growing interest in efforts to strengthen women's knowledge and opportunities to promote their reproductive health rights in Palestine. This study aimed to identify the multiple political, demographic, and cultural factors that influence Palestinian women's reproductive health rights as well as their knowledge, awareness, opportunities, and challenges regarding these rights.

**Methods** The study was designed with two parts. First, a thorough review of previous literature was carried out using key terms and definitions to search for papers, to gain an overview of reproductive health rights in Palestine, focusing on the long-standing conflict, the Palestinian cultural context, and Palestinian law. Second, an empirical qualitative study was carried out using semi-structured interviews that were carried out via Skype. A purposive sample of ten Palestinian women aged 18–55 years, and living in the Bethlehem Area of the West Bank, were chosen. The sample was selected to include Islamic and Christian women, refugee and non-refugee women, and housewives and working wives. Interviews formed the basis of the analysis. The theory of intersectionality was used to guide the various discussions and debates within the interviews. All interviews were conducted in Arabic, recorded on a portable device, and translated into English. They were then analysed using the Six-Phase Thematic Analysis. Ethics approval was obtained from the Queen Margaret University Ethics Committee. Informed written consent was obtained from participants.

**Findings** The literature from approximately the past 20 years confirms that women's health has had a place in Palestinian health regulations and policies. Many Palestinian organisations and institutions have launched procedures to promote reproductive health for women and their families, through maternal and child health services. Despite the focus on women's health and reproduction, access to knowledge or education regarding reproductive health rights in Palestine is limited. Access has been hampered by the combination of the political situation and traditional cultural norms existing in Palestinian society. Interviews were considered in the context of several themes and sub-themes: knowledge, information, and education (knowledge levels and access to information and knowledge); services and resources (accessibility and distribution of services); Palestinian context and norms (patriarchal society and loss of privacy and decision making); conflict and occupation (restriction of movement, and discrimination and humiliation); and violence against women. These themes shaped women's knowledge of reproductive health rights, highlighting factors that influence the existing opportunities and challenges for women to access reproductive health care and services, health-seeking behaviours, and overall wellbeing. Reproductive health rights in Palestinian society are perceived and acknowledged differently by different group of individuals (eg, between those living in cities and those in villages), but such differences are rarely mentioned in laws, policies, or programmes relating to reproductive health. Moreover, there is often a gap between laws and policies that are set, and what is implemented.

**Interpretation** This research emphasises the great importance of women's reproductive health rights in Palestine. Two significant limitations were the unavailability and scarcity of literature on Palestinian women's reproductive health rights, and the sensitive nature of the political conflict. It is recommended that governments demonstrate commitment to prioritising initiatives to promote reproductive health rights. Further research regarding reproductive health rights should be conducted in other areas of Palestine.

**Funding** None.

### Contributors

YH designed the study, collected, analysed and interpreted data, and wrote the Abstract.

### Declaration of interests

I declare no competing interests.

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# Well-being and its determinants from the perspective of the Palestinian youth in the occupied Palestinian territory

Weeam Hammoudeh, Ahmad Khatib, Dima Masoud, Suzan Mitwalli, Shiraz Nasr

## Abstract

**Background** Young people in the occupied Palestinian territory face challenges—including economic, political, and social challenges—that hinder their wellbeing. It is therefore pertinent to understand the needs of the youth and the factors that determine their well-being. This study explores the understanding and definition of well-being from the perspective of Palestinian youths, and their views of the factors that influence wellbeing.

**Methods** A qualitative investigation of twelve focus group discussions was carried out in 2017. The participants were Palestinian youths (aged 18–32 years) residing in the West Bank, including East Jerusalem, and the Gaza Strip. Participants were selected using snowball sampling, with the help of various community organisations, and youths' personal contacts. A total of 123 youths participated in the discussions, which were recorded and transcribed verbatim. Research team members coded the transcripts and then organized codes into key dimensions of life (ie, economic, political, social, and personal), and into themes within these dimensions. Ethics approval was obtained from Birzeit University. Informed verbal consent was obtained from all participants.

**Findings** The participants defined wellbeing as having good health (both physical and psychological), being active, and having the energy, drive, and stamina to face challenges and to persevere. We organised the reported determinants of wellbeing into four key dimensions of life: political, economic, social, and personal. In general, the participants believed that they influenced wellbeing through their interactions with each other. The political dimension was reported to be an important determinant of wellbeing, and had a direct effect on other dimensions, particularly the economic dimension. Prolonged military occupation and blockade in the Gaza Strip, and related restrictions were perceived to have a negative impact on wellbeing, especially when they limited the youths' mobility and opportunities. The participants' discussions of the internal political situation highlighted the diminishing space for youth in the political and public spheres, as well as a lack of trust in Palestinian political institutions. Participants noted that corruption, cronyism and nepotism, autocracy, and ageism within these institutions further excluded and demoralised youth. The economic dimension included personal and household economic conditions, as well as broader economic conditions, both at the local and country level. The youths believed that adequate economic conditions at the household level are necessary but insufficient to ensure wellbeing, and that poor economic conditions at a broader level, especially unemployment, had negative effects on wellbeing. The social dimension includes both family-level factors and societal-level factors. Most youths considered their families to be a source of support with positive family relationships resulting in better wellbeing. However, experiences within the broader community were mixed, with youths consistently noting that they faced negativity and discouragement from others. The participants reported that personal characteristics moderated the effects of social, economic, and political conditions; personality traits such as determination and perseverance had the potential to help them to overcome negative influences.

**Interpretation** The findings from this study highlight the ways in which various dimensions of life interact to influence wellbeing from the perspective of Palestinian youths. The extremely challenging political and economic conditions, and the continued exclusion of youth from various aspects of life, as described by participants, hinder wellbeing and add to the discouragement of youth.

**Funding** The fieldwork for this study was funded by a grant from Oxfam Quebec.

### Contributors

WH, AK, DM, SM, and SN were involved in data collection, coding, and analysis of transcripts. WH drafted the Abstract, with input from all other authors. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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# Modification of the impact of access to water on childhood diarrhoea by socioeconomic status in the Gaza Strip from 2000 to 2014: a cross-sectional study

Victoria Ponce Hardy, Amira Shaheen, Ai Milojevic

## Abstract

**Background** Access to unsafe water is a concern in the Gaza Strip, where water supplies continue to degrade owing to regional sanctions, bombardment, and mismanagement. Our previous study found that decreased access to public water networks was associated with increased diarrhoea prevalence in children younger than 5 years in the Gaza Strip. This study examined the role of socioeconomic status as an effect modifier in this association.

**Methods** We used data from five consecutive demographic health surveys and multiple indicator cluster surveys conducted by the Palestinian Central Bureau of Statistics in 2000, 2004, 2006/2007 (December, 2006, to March, 2007), 2010, and 2014. Multivariable logistic regression models were applied to pooled data with prevalence of diarrhoea as the outcome and access to water as the main exposure of interest, with adjustment for age, sex, governorate, and survey year (to adjust for the seasons or other administrative conditions, for each survey). Access to water was characterised by the type of source, namely piped, other improved (eg, public standpipe, borehole, protected dug well, protected spring, and rainwater collection), or unimproved, as defined by the WHO. We defined socioeconomic status in the analysis using maternal education, refugee status, and locality type (urban, rural, or camp).

**Findings** The odds ratio (OR) of diarrhoea for children with access to unimproved water sources was higher than for those with access to piped water sources when mothers had only primary education (OR 1.35; 95% CI 1.07–1.71) than when mothers also had secondary or higher education (1.09; 0.93–1.27). The OR for children in camps was 1.32 (1.10–1.57) compared with 1.19 in urban areas (1.05–1.36). Point estimates of ORs suggested strong effect modification by refugee status, although with wider CIs for non-registered refugee children (4.95; 1.58–15.55) than for registered refugees (1.35; 1.18–1.53) or non-refugees (1.18; 1.07–1.43).

**Interpretation** Our results suggest that, in the Gaza strip, children with lower socioeconomic status experience a greater burden of diarrhoea morbidity risk than children with higher socioeconomic status, even when using the same type of water source. Changes to policy are required to address such disproportionate burden of diarrhoea risk in the occupied Palestinian territory.

**Funding** None.

## Contributors

VPH and AM developed the concept and study design. VPH, AS, and AM secured data access. VPH conducted data collection, management, and analysis. VPH and AM contributed to interpretation of the results. VPH, AS, and AM wrote and revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Maternal and child health and care provision in Palestine: data from the national electronic maternal and child health registry (MCH eRegistry)

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## Abstract

**Background** Good quality data from health systems can benefit several stakeholders, including policy makers, care providers, clients, and researchers. Conventional data collection methods for maternal and child health, such as household surveys, may not be suitable to assess processes of service delivery. The electronic maternal and child health registry (MCH eRegistry) has been implemented in 182 governmental primary care clinics in Palestine. Here we present the data in the MCH eRegistry.

**Methods** We processed the raw data in the MCH eRegistry from the West Bank, and documented validation rules for crude data points (time of entry, values allowed). Definitions and appropriate categorisations were created for core process indicators. Data from the MCH eRegistry and the electronic health information system in governmental hospitals were linked using statistical software.

**Findings** As per the second quarter of 2018, the MCH eRegistry contained raw data on 69 793 antenatal care visits, 27 304 postpartum care visits and 40 264 newborn care visits. From antenatal care, data on core process indicators were available for screening of anaemia (n=48 542), hypertension (n=66 814), diabetes (n=18 013), asymptomatic bacteriuria (n=31 757), as well as antenatal ultrasound (n=55 453). Distributions of raw data on haemoglobin and blood pressures had no extreme outliers. Links had been established between antenatal care and delivery data in governmental hospitals for 51% of births.

**Interpretation** The MCH eRegistry contains data from antenatal to postpartum and newborn care. These data have been successfully linked with delivery data, resulting in a large data set on continuity of care and birth outcomes. Furthermore, the data are accessible, of good quality, and can be used for studies of quality of care and maternal and newborn epidemiology, among others. Researchers are invited to use this resource in working towards improving the health system and the health of Palestinians.

**Funding** European Research Council and Research Council of Norway.

## Contributors

MI formulated the research question, carried out data management and analysis, and wrote the Abstract. MV contributed to analysis, interpreted results and wrote the Abstract. TA carried out data curation. BG supervised the project and revised the Abstract. KAK, TH, MB, and EA supervised data collection as part of the support provided by the MCH eRegistry. RS and AR provided contextual knowledge and administrative support for data management. BB contributed to data analysis. JFF conceptualised data collection from the MCH eRegistry, refined the research question, interpreted data, and revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Local medical students can be instructors for life-saving first-aid courses for lay people: a descriptive study from Gaza

Anas Ismail, Maisara Al Rayyes, Mohammed Shatat, Rajai Al Hafj, Hanne Heszlein-Lossius, Guido Veronese, Mads Gilbert

## Abstract

**Background** Bystanders can initiate a chain of survival in emergency situations by recognising the situation, calling for help, and initiating basic life support (BLS) and first aid. The lay population of Gaza has had little if any access to systematic BLS and CPR training. This study aimed to find out whether medical students could act as instructors to train 3000 lay people in BLS and CPR.

**Methods** We selected 82 medical students from Al Azhar University to train as BLS and CPR instructors. Student volunteers who were in their third, fifth, and sixth year of medical school were chosen based on sex (to achieve equal numbers of males and females) and geography (for approximately even geographical distribution). Their training included 12 hours of BLS and CPR skills and 4 hours of didactic instruction, with a view to delivering 1–2 hours of basic training for lay people. Students responded to a written questionnaire with details of their demographics, training experience, motivation, and expectations. Teaching materials and methods were based on the European Resuscitation Council guidelines and followed a similar training model as that at The Arctic University of Norway (UiT). The board of the Faculty of Medicine at Al Azhar University approved the training and the study.

**Findings** 82 medical students completed training (mean age 21.7 years [SD 1.25]; 54% [44 of 82] female, 46% [38 of 82] male). Following training, 87% of students (71 of 82) responded to the questionnaire and 76% (62 of 82) took part in training lay people. Of those who completed the questionnaire, five reported having lost family members during Israeli military operations in Gaza (the questionnaire section on demographics included the impact of warfare on the students' lives). Almost two-thirds (54 of 71) had no previous practical first aid training. 49 of 71 (69%) described a sense of belonging and duty to the community as their most important motivation, and 56 of 71 (79%) hoped that their training would contribute to increased capacity and skills in the community's response to emergencies, especially during attacks. 55 training sessions have been completed so far, involving 1222 lay participants, mostly school students (including students at vocational schools) aged 13–20 years (75%; 922 of 1222). 62 student instructors have been active, with a ratio of 5.4 lay trainees to each student instructor. Of the trainees, 45% were male (546 of 1222) and 55% female (676 of 1222).

**Interpretation** We have shown that local medical students are willing and capable of being trained as volunteer instructors to teach BLS and CPR, targeting lay people in serious conditions. The effects of such training on local resilience and patient outcomes need further study.

**Funding** The Palestine Children Relief (PCRF) funded the travel expenses of the trainers and provided medical students with first aid kits.

### Contributors

AI, MAR, MS, RAH, HH-L, GV, and MG contributed to the project idea, planning, and development. AI, MAR, MS, and RAH recruited and selected the student instructors, and collected the data. HH-L and MG were responsible for instructor training. MG designed the study. AI wrote the Abstract, and HH-L, GV, and MG revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

### Acknowledgments

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# Assessment of the hygiene-related risks of child illness at selected elementary schools in Nablus city: a cross-sectional survey

Mohammad Qadi, Lubna Kharraz, Amira Shaheen, Athar Amleh, Fatima Ibrahim, Doaa Abu Saleh, Hanin Rabee, Ro'ya Hamed, Ghassan Shakhshir, Rasha Khayyat

## Abstract

**Background** The health and safety of children at schools in Palestine are not paid the attention they require. Our objective was to assess the major risks and patterns associated with hygiene and sanitation at selected schools in Nablus in the West Bank.

**Methods** A two-layer cross-sectional survey was implemented to collect data on hygiene, sanitation, and bacterial contamination from pupils and staff at ten urban schools in Nablus. We took swab samples from 199 children's and eight food handlers' dominant hands and from 82 school bathrooms and classrooms. We observed and recorded variables related to school hygiene on a pre-prepared form. Bacterial identification for each sample was done at An-Najah National University. Using univariate and multivariate analysis, risk factors related to hygiene and sanitation were tested for individual and combined association with the presence of bacterial species transmitted primarily through fecal-oral contamination. Approval was obtained from the institutional review board committee at An-Najah University and consent forms were signed by children's parents and by food handlers.

**Findings** Our findings showed non-statistically significant associations between the presence of bacterial species that indicate a substantial risk of fecal-oral contamination (*Listeria*, *Streptococcus*, *Micrococcus*, *Bacillus subtilis*, and Gram-negative bacilli) and the following factors: school address (univariate analysis,  $p=0.384$ ), absence of soap in the school, absence of hand washing after use of bathroom, increased number of children per classroom, and decreased numbers of teachers, toilets, and sinks per number of students at school (ordinal logistic regression,  $p=0.084$ ).

**Interpretation** This pilot study highlights the presence of several risk factors for bacterial contamination, including child behaviour and aspects of the school environment, favouring the possible spread of fecal-oral transmitted diseases. Policy makers' efforts should be turned towards new policies rendering schools a safer place for Palestinian children. This study has to be validated on a larger scale and in other cities in the occupied Palestinian territories.

**Funding** This research was funded by An-Najah University as a support for research projects of medical students.

### Contributors

RK, GS, and AS conceived the idea for the study. RK wrote the Abstract. DS, HR, and RH collected the samples in Nablus and LK, MA, AA, and FI identified the bacteria. DS, HR, and RH did the analysis under the supervision of RK and GS. MA and LK contributed equally.

### Declaration of interests

We declare no competing interests.

### Acknowledgments

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# Evaluation of types and treatment protocols for breast cancer among Palestinian women: a retrospective study

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## Abstract

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**Background** Breast cancer is the leading cause of cancer deaths among females in Palestine. The aims of this study were to assess the histological types of breast cancer, the stage at diagnosis, and oestrogen receptor status of women with breast cancer in the West Bank.

**Methods** This retrospective study was conducted in the two major outpatient oncology clinics of the West Bank (Al-Watani Governmental Hospital in Nablus and Beit Jala Governmental Hospital). The data collection form was completed by reviewing patients' medical records. SPSS was used for data analysis. The study was approved by the Institutional Review Board of An-Najah National University and the Palestinian Ministry of Health.

**Findings** The study included 400 women with an average age of 52.16 years (SD 11.56); as the number of patients with breast cancer in the country was not known, a sample size calculator was input with an estimate of breast cancer cases, as given by six oncologists. Ductal carcinoma was the most common histological type (79%; 317 of 400), followed by lobular carcinoma (15%; 60). Patients were most commonly diagnosed at stage three (27%; 106), followed by stage two (25%; 100), stage four (24%; 95), and stage one (20%; 81). Most patients (88%; 353) were not tested for *BRCA1* and *BRCA2* gene mutations. Among the tested patients, 5% (21) had *BRCA1* or *BRCA2* gene mutation. Regarding oestrogen receptor status, 249 out of 386 women (65%) for whom data were available had a positive test, and the progesterone receptor test was positive for 225 out of 385 women (58%) for whom data were available. In terms of HER2 receptor overexpression, 306 out of 381 women (80%) for whom data were available had negative test results.

**Interpretation** The most common type of breast cancer among Palestinian women is invasive ductal carcinoma. Approximately half of the patients were diagnosed at stage three or four, indicating that better awareness and earlier diagnosis are needed. A high percentage of patients had positive oestrogen receptor and progesterone receptor status, which makes hormone therapy an important part of treatment.

**Funding** None.

### Contributors

RR participated in study design, data analysis, data interpretation, and writing and revision of the Abstract. DN, DM, EH, S Gnimat, and S Gayada participated in study design, data collection and data analysis. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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## Abstract

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### Declaration of interests

We declare no competing interests.

# Gender inequality and associated factors from the perspective of the Palestinian youth: a cross-sectional study

Shiraz Nasr, Weeam Hammoudeh

## Abstract

**Background** Women face gender inequality and marginalisation in many aspects of their lives that affect their wellbeing and role in life as important members of society. This study aimed to investigate attitudes towards gender equality in Palestinian youth, and the associated factors.

**Methods** We used the Power2Youth 2015 dataset, which consists of a sample of 1353 young people aged 18–29 years (46% males and 54% females) living in the West Bank and Gaza. Households with youths were randomly selected. In the households with more than one youth, a kish grid was used to select the youth participant. Our Prowomen scale was developed to measure participants' attitudes towards gender equality by scoring their responses to 15 questions related to gender equality issues such as the ability and right to work, divorce laws, inheritance rights, leadership, and the right to education. Positive responses to statements favourable to gender equality or biased towards women were given a score of 1, and disagreement was given a score of 0. For statements that were unfavourable to gender equality, disagreement was given a score of 1, and agreement a score of 0. Scores were then summed into one composite score, ranging from 0 to 15. Multivariate linear regression was used to examine the association between individuals' scores on the Prowomen scale (the outcome variable) and gender, age, wealth index, place of residence, education, mother's education and employment, and their score on a scale measuring the perceived influence of women in society (developed using questions relating to women's influence in choosing their spouse, education, and work). Ethics approval for the project was attained from Birzeit University and informed verbal consent was obtained from all participants.

**Findings** Of the factors assessed, the main predictors of attitudes towards gender equality were gender, age, place of residence, education, mother's education and employment, and the perceived influence of women in society. The scores ranged between 0 and 15 on the Prowomen scale. On average, men agreed with 2.3 fewer items than women ( $\beta = -2.334$ ,  $p < 0.0001$ ). Residents in the West Bank had significantly higher scores than residents in the Gaza Strip ( $\beta = 0.843$ ,  $p < 0.0001$ ). Residents of camps had significantly higher scores than residents of urban areas ( $\beta = 0.783$ ,  $p < 0.0001$ ). Respondents educated to beyond secondary level supported approximately one additional item ( $\beta = 0.979$ ,  $p < 0.0001$ ) compared with those educated to below secondary level. Mother's education and employment were also significantly and positively associated with scores on the Prowomen scale. Youths whose mothers had completed secondary education or higher supported approximately one additional item on the scale compared with youths whose mothers were educated to below secondary level ( $\beta = 0.837$ ,  $p < 0.01$ ). Respondents whose mothers were employed also supported approximately one additional item ( $\beta = 0.923$ ,  $p < 0.01$ ). Each time respondents reported that they believed women had influence, they supported approximately 0.3 items on the Prowomen scale ( $\beta = 0.269$ ,  $p < 0.001$ ).

**Interpretation** Our results highlight the need to target men with awareness programmes relating to gender equality. Women's education, and that greater involvement and inclusion of women in society and in the labour market can potentially foster more favourable attitudes towards equality.

**Funding** The research that produced the Power2Youth dataset received funding from the European Union's Seventh Framework Programme (FP7/2007–2013) under grant agreement number 612782. Data analysis and production of the Abstract was supported by the Arab Fund for Economic and Social Development.

### Contributors

Both authors contributed to statistical analysis and writing of the Abstract. Both authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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# Hospitalisation coverage by UNRWA in Jordan, Lebanon, Syria, Gaza, and the West Bank: a comparative snapshot analysis

Gloria Paolucci, Majed Hababeh, Wafaa Zeidan, Akihiro Seita

## Abstract

**Background** The United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) supports the hospitalisation of Palestine refugees with country-specific policies in five fields of operation; Jordan, Lebanon, Syria, Gaza, and the West Bank. The objective of this study was to compare caseloads and percentage vulnerability generated by the different policies.

**Methods** A comparative snapshot analysis was conducted on diagnoses for hospitalized patients (13 818 patients in total) for selected months in 2016 and 2017, categorized according to UNRWA-defined criteria (lifesaving, urgent, or non-urgent surgeries, and vaginal delivery or caesarian section). The vulnerability criterion was the Social Safety Net Program (SSNP) status of Palestine refugees (enrolment in the UNRWA SSNP). Data were processed in Excel. Ethical approval was granted from the UNRWA Department of Health.

**Findings** In Jordan, 85% of support (1905 of 2242 cases) was provided for deliveries (vaginal delivery or caesarian section). In Lebanon, 66% (2662 of 4064) were lifesaving and urgent interventions, 26% (1051) non-urgent surgeries, and 7% (284) deliveries. In Syria, 40% (637 of 1594) were urgent, 38% (605) non-urgent surgeries, and 19% (303) deliveries. In Gaza, 26% (675 of 2657) were urgent, 35% (924) non-urgent surgeries, and 40% (1058) deliveries. In the West Bank, 43% (1412 of 3261) were urgent, 10% (333) non-urgent surgeries, and 42% (1367) deliveries. The percentage of vulnerable cases reflects the safety net role of UNRWA: 16% (351) in Jordan, 20% (817) in Lebanon, 46% (738) in Syria, and 19% (506) in Gaza. In the West Bank, only 3% (106) of patients were vulnerable.

**Interpretation** The profile of patients that used the UNRWA hospitalisation support programme is consistent with hospitalisation policies in UNRWA's fields of operation and the different access that Palestine refugees have to local health services. There is reasonable health-care provision for Palestine refugees in Jordan, whereas UNRWA is the only health-care provider for most Palestine refugees in Lebanon. Ongoing conflict limits access to health care in Syria. Mixed caseloads reflect that priority is given to surgeries and deliveries in Gaza and that UNRWA is the alternative to Ministry of Health services in the West Bank, as the mixed UNRWA caseloads in the West Bank match those of government-supported hospitalisation services, suggesting that people use either one or another. In the case of Gaza, UNRWA-supported hospitals focus on those services most requested by potential users, non-urgent surgeries and deliveries, which become complementary to government services. UNRWA should improve its data collection to have more accurate and up-to-date data. More analysis is needed to understand the financial implications of the differences in policies and how to perform strategic interventions.

**Funding** None.

## Contributors

GP carried out data analysis and interpretation, produced tables and figures, and wrote the Abstract. MH carried out data collection and contributed to data analysis. WZ contributed to the study design, carried out data collection and data analysis, and produced tables. AS contributed to the study design, analysed and interpreted data, and revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# The impact of damage to buildings on displacement during the 2014 Israel–Gaza war: a propensity score matching study

Alyssa S Parpia, Marwan Khawaja

## Abstract

**Background** The July 2014 war in Gaza caused more devastation in the area than at any time since the Israeli occupation began in 1967. The 50-day war resulted in more than 2200 Palestinian deaths, over 11000 injuries, and large-scale destruction of infrastructure and displacement of over a quarter of the Palestinian population in Gaza. In this study, we examined the causal effect of damage to buildings within a neighbourhood on displacement behaviour in Gaza. Identifying demographic and socioeconomic predictors of displacement, given ongoing exposure to chronic violence and precarious living conditions in Gaza, will allow for action to be taken to avert the consequences of modifiable risk factors of displacement in this population.

**Methods** The study was based on data from a 2015 cross-sectional survey including a representative sample of households in the occupied Palestinian territory. The study sample included 10 017 Gazans aged 18 years and above from whom complete data were available for 9285 adults, who were included in matching analysis. Through a quasi-experimental design, propensity score matching estimators were used to evaluate causality between exposure and outcome. The exposure effect was whether 5% or more of the buildings in a respondent's neighbourhood experienced damage. The outcome variable was self-reported displacement from residence as a result of the war. Score matching was conducted using age, sex, education, marital status, refugee status, Gaza residence, employment, household age composition, household crowding ( $\geq 3$  people per room, excluding kitchen and bathrooms), income, injury status, chronic disease status, and car possession status.

**Findings** Of the 9285 adults in the analysis, 5304 (57·12%) reported displacement and 3005 (32·36%) lived in an area that experienced damage to buildings during the war. Being a refugee in Gaza and having higher levels of educational attainment were found to be protective against experiencing displacement. An analysis of model-based estimates and average treatment effect showed a positive effect of neighbourhood damage on displacement (average treatment effect 0·35; 95% CI 0·33–0·36), indicating that living in an area that experienced damaged due to war caused displacement.

**Interpretation** Damage to buildings had a substantial impact on population displacement during the 2014 Israel–Gaza conflict, but was not the sole predictor of displacement. The substantial proportion of individuals who were displaced did not live in areas that experienced damage directly, indicating that they were potentially influenced by perception of danger and fear in general. A limitation of this study is the possibility that not all relevant covariates in the matching stage are accounted for, which would reduce comparability of treatments and control groups, and thus limit assertions of causality. Findings from this study can be used to help inform public health programmes and policies designed to protect and serve displaced civilian populations during humanitarian emergencies such as wars, in Gaza and beyond.

**Funding** This project was supported, in part, by a research grant from the Yale MacMillan Center for International and Area Studies, and an award from the Yale Center for the Study of Race, Indigeneity, and Transnational Migration.

## Contributors

MK and ASP conceived and designed the study. ASP and MK analysed the data and wrote the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

## Acknowledgments

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# Psychological distress, job satisfaction, and work engagement among Palestinian teachers: a cross-sectional study

Alessandro Pepe, Loredana Addimando, Jamal Dagdukee, Guido Veronese

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## Abstract

**Background** Work engagement is a positive, fulfilling affective and motivational state of work-related wellbeing and a protective factor for workers' mental health. The aim of the present study was to examine the association between psychological distress (conceptualised as the target variable), job satisfaction, and work engagement in contexts of low-intensity warfare and political violence. According to the salutogenic perspective, the relationship between job satisfaction and psychological distress is influenced by the level of work engagement.

**Methods** We selected a convenience sample of 380 Palestinian teachers from Gaza (40%, 152 out of 380) and the West Bank (60%, 228 out of 380). The participants were recruited on-site during morning breaks from the classroom teaching activity. The selection criteria were being in a teaching position, and working in a primary or lower secondary school. The participants completed the Arabic versions of the Teacher Job satisfaction Scale (TJSS-9), the General Health Questionnaire (GHQ-12) and the Utrecht Work Engagement Scale (UWE-SF). The statistical strategy was based on structural equation modelling. The study was approved by the Ethical Board of the University of Milano Bicocca. Informed written consent was obtained from all participants.

**Findings** The General Health Questionnaire cumulative score revealed a medium to high level of psychological distress (mean 18.68 [SD 4.03]) among teachers, but high job satisfaction (mean 27.18 [SD 5.65]). The structural model showed an excellent fit ( $\chi^2(23)=69.6$ ,  $p<0.0001$ ,  $NC=3.021$ ,  $NFI=0.939$ ,  $NNFI=0.959$ ,  $CFI=0.958$ ,  $RMSEA=0.073$ ). Job satisfaction and psychological distress had a moderate and inverse relationship that was, statistically speaking, fully mediated by the level of work engagement ( $F=17.05$ ,  $p<0.001$ ,  $R^2=0.16$ ). The direct effect of job satisfaction on work engagement was positive and medium (according to Cohen, 1988) in strength.

**Interpretation** The main finding of the study is that work engagement may mediate the impact of job satisfaction on teachers' psychological distress by lessening the effect of difficult working conditions. It further suggests that in order to mediate the effect of low job satisfaction on psychological distress of teachers, organisational policies and practices should focus on improving employees' work engagement. This means that, in developing job programmes for teachers in contexts characterised by difficult working conditions, the main focus must be to increase the level of subjective resources (eg, inner states, emotional activation, personal motivational processes) and workers' engagement rather than focusing primarily on job satisfaction.

**Funding** None.

## Contributors

GV planned the research and wrote the Abstract. AP and LA carried out statistical analysis and wrote the Abstract. JD collected data. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

# Psychological distress, job satisfaction, and work engagement among Palestinian teachers: a cross-sectional study

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**Methods** We selected a convenience sample of 380 Palestinian teachers from Gaza (40%, 152 out of 380) and the West Bank (60%, 228 out of 380). The participants were recruited on-site during morning breaks from the classroom teaching activity. The selection criteria were being in a teaching position, and working in a primary or lower secondary school. The participants completed the Arabic versions of the Teacher Job satisfaction Scale (TJSS-9), the General Health Questionnaire (GHQ-12) and the Utrecht Work Engagement Scale (UWE-SF). The statistical strategy was based on structural equation modelling. The study was approved by the Ethical Board of the University of Milano Bicocca. Informed written consent was obtained from all participants.

**Findings** The General Health Questionnaire cumulative score revealed a medium to high level of psychological distress (mean 18.68 [SD 4.03]) among teachers, but high job satisfaction (mean 27.18 [SD 5.65]). The structural model showed an excellent fit ( $\chi^2(23)=69.6$ ,  $p<0.0001$ ,  $NC=3.021$ ,  $NFI=0.939$ ,  $NNFI=0.959$ ,  $CFI=0.958$ ,  $RMSEA=0.073$ ). Job satisfaction and psychological distress had a moderate and inverse relationship that was, statistically speaking, fully mediated by the level of work engagement ( $F=17.05$ ,  $p<0.001$ ,  $R^2=0.16$ ). The direct effect of job satisfaction on work engagement was positive and medium (according to Cohen, 1988) in strength.

**Interpretation** The main finding of the study is that work engagement may mediate the impact of job satisfaction on teachers' psychological distress by lessening the effect of difficult working conditions. It further suggests that in order to mediate the effect of low job satisfaction on psychological distress of teachers, organisational policies and practices should focus on improving employees' work engagement. This means that, in developing job programmes for teachers in contexts characterised by difficult working conditions, the main focus must be to increase the level of subjective resources (eg, inner states, emotional activation, personal motivational processes) and workers' engagement rather than focusing primarily on job satisfaction.

## Funding None.

### Contributors

GV planned the research and wrote the Abstract. AP and LA carried out statistical analysis and wrote the Abstract. JD collected data. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

# Evaluation of types and treatment protocols for breast cancer among Palestinian women: a retrospective study

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## Abstract

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**Background** Breast cancer is the leading cause of cancer deaths among females in Palestine. The aims of this study were to assess the histological types of breast cancer, the stage at diagnosis, and oestrogen receptor status of women with breast cancer in the West Bank.

**Methods** This retrospective study was conducted in the two major outpatient oncology clinics of the West Bank (Al-Watani Governmental Hospital in Nablus and Beit Jala Governmental Hospital). The data collection form was completed by reviewing patients' medical records. SPSS was used for data analysis. The study was approved by the Institutional Review Board of An-Najah National University and the Palestinian Ministry of Health.

**Findings** The study included 400 women with an average age of 52.16 years (SD 11.56); as the number of patients with breast cancer in the country was not known, a sample size calculator was input with an estimate of breast cancer cases, as given by six oncologists. Ductal carcinoma was the most common histological type (79%; 317 of 400), followed by lobular carcinoma (15%; 60). Patients were most commonly diagnosed at stage three (27%; 106), followed by stage two (25%; 100), stage four (24%; 95), and stage one (20%; 81). Most patients (88%; 353) were not tested for *BRCA1* and *BRCA2* gene mutations. Among the tested patients, 5% (21) had *BRCA1* or *BRCA2* gene mutation. Regarding oestrogen receptor status, 249 out of 386 women (65%) for whom data were available had a positive test, and the progesterone receptor test was positive for 225 out of 385 women (58%) for whom data were available. In terms of HER2 receptor overexpression, 306 out of 381 women (80%) for whom data were available had negative test results.

**Interpretation** The most common type of breast cancer among Palestinian women is invasive ductal carcinoma. Approximately half of the patients were diagnosed at stage three or four, indicating that better awareness and earlier diagnosis are needed. A high percentage of patients had positive oestrogen receptor and progesterone receptor status, which makes hormone therapy an important part of treatment.

**Funding** None.

### Contributors

RR participated in study design, data analysis, data interpretation, and writing and revision of the Abstract. DN, DM, EH, S Gnimat, and S Gayada participated in study design, data collection and data analysis. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

# Coping strategies of Palestinian adolescents and young adults with cancer: a triangulation approach

Amal A Salman, Asma M Imam

## Abstract

**Background** Cancer is the second leading cause of death in Palestine, accounting for 13·8% of all deaths. The adolescent and young adult (AYA) population is considered to include individuals aged 15–39 years. Diagnosing cancer at any age is an inevitable stressor. In the case of AYAs who have been diagnosed with cancer, fears relating to future and developmental consequences grow as they negotiate developmental normative tasks during this period of their lives. This study aimed to identify the strategies used by patients aged 15–39 years to cope with cancer.

**Methods** A triangulation approach was used, involving two hospitals—Beit-Jala governmental hospital and Augusta Victoria non-governmental hospital—offering oncology services in the West Bank between August, 2017, and April, 2018. These were chosen based on their capacity to treat cancer patients from all regions in West Bank and Jerusalem. The brief COPE scale (the abbreviated version of the COPE inventory) and the Arabic version of the SpREUK-P self-administered questionnaire were completed by a convenience sample of 165 patients aged 15–39 years from the hospitals. Qualitative in-depth interviews were also conducted with 12 individuals to obtain a more in-depth understanding of their coping strategies with cancer, based on content analysis. Statistical tests (Student's *t*-test, ANOVA, Tukey's honest significant difference, Pearson's correlation) were performed using IBM-SPSS (version 20). Written informed consent was obtained from patients, and parents or guardians of patients under 18 years old. The study was approved by the School of Public Health of Al-Quds University.

**Findings** Out of 196 respondents, 165 completed the questionnaire of the quantitative survey; a response rate of 84%. Individuals indicated the degree to which they use each coping strategy on a four-point Likert scale, ranging from 1 (not at all) to 4 (a lot). Different coping strategies were used by patients. Religion and acceptance of cancer were the most commonly used (mean 3·77, SD 0·5), followed by emotional support (3·65, 0·67), active coping (3·55, 0·64), and planning (3·43, 0·85). The lowest scores were for behavioural disengagement (1·46, 0·76), self-blame (1·56, 0·76), and substance use (1·69, 0·98). Respondents used problem-focused coping strategies (3·34, 0·53) more than emotion-focused coping strategies (2·67, 0·30). The major themes of coping identified in the interviews were: coping mechanisms associated with religion, social support and affiliation, acceptance, positive reinterpretation and growth, self-distraction, planning, and spirituality coping.

**Interpretation** Our findings underline the range of methods by which young people cope with cancer, and the importance of helping individuals to find and use the coping strategies that are best suited to them.

**Funding** None.

## Contributors

AAS designed the study, conducted the literature search, gathered, analysed, and interpreted the data, and wrote the Abstract. AMI designed the study, interpreted the data, and supervised the study. Both authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

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# Recent changes in welfare indicators among Palestinian refugees in Lebanon: a comparative study of two cross-sectional datasets

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## Abstract

**Background** Palestinians in Lebanon have been protracted refugees for 70 years, but the Syrian crisis has caused shocks that threaten to destabilise their already fragile livelihoods. Over a million Syrian refugees and 42 000 Palestinian refugees from Syria have fled to Lebanon, adding pressure to an already weak infrastructure and labour market. The United Nations Relief and Works Agency (UNRWA), the main provider of health, education and relief services to Palestinian refugees, is exceptionally strained. This study examines changes in education, health, employment, food security, and poverty indicators for Palestinian refugees in Lebanon (excluding Palestinian refugees from Syria) using two nationally representative household surveys conducted in April, 2010, and July, 2015.

**Methods** The surveys were conducted using multi-stage cluster random sampling. Both surveys included households residing in camps and gatherings. Health conditions were reported for all household members by a proxy survey respondent from among the household members. Food insecurity was assessed using the Arab Family Food Security Scale. The poverty lines (thresholds) were set at US\$6·84 per person per day (upper poverty line) and US\$2·47 per person per day (extreme poverty line) in 2015, and US\$6 per person per day (upper poverty line) and US\$2·17 per person per day (extreme poverty line) in 2010. The difference across the 2 years reflects adjustment for inflation rates within the 5-year period. Data were analysed using STATA13. The study was approved by the Institutional Review Board of the American University of Beirut. Informed verbal consent was obtained from the survey respondents.

**Findings** Of the eligible sampled households of Palestinian refugees in Lebanon, 88% (2974 of 3382) in 2015 and 99% (2593 of 2626) in 2010 gave informed consent and completed the questionnaire. Net enrolment rates for elementary education remained high (98% in 2015 and 95% in 2010), but failed to lead to better labour market outcomes. The unemployment rate increased from 8% in 2010 to 23% in 2015, and the fraction working in elementary occupations increased from 23% to 36%. Overall poverty remained unchanged but with considerable regional shifts: poverty increased by 9% and 11% in central Lebanon and north Lebanon, respectively, whereas it dropped by 8% and 9% in Saida and Tyre. Extreme poverty was halved from 7% to 3%. There was a high prevalence of chronic diseases in both years (37% in 2015 and 31% in 2010); and in 2015, out-of-pocket health expenditure was six times higher when the household reported at least one chronic condition (US\$50·9 per capita per month compared with US\$8·3 per capita per month). Despite the reduction in extreme poverty, 4% of households shifted from moderate to severe food insecurity.

**Interpretation** Pressures on UNRWA services come at a time when the organisation is operating with a large shortfall in funding. Recent US funding cuts may have dire repercussions for a population burdened by a high prevalence of chronic conditions and facing high healthcare costs. With additional budgetary strains and worsening labour market conditions, Palestinian refugees in Lebanon risk losing some of the ground that they have gained in net enrolment rates in education, access to health-care services and the reduction in extreme poverty that the UNRWA has worked towards for decades.

**Funding** UNRWA funded the data collection for both surveys.

### Contributors

NS, JC, HG, and KS designed and ran the household survey in 2010. NS, JC, HG, AI, and TI designed and ran the household survey in 2015. NS conceived the study, and SK helped with drafting the Abstract. All authors have seen and approved the final version of the Abstract for publication.

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# Determination of iodine level in consumer table salt from production to consumption: a cross-sectional study in occupied Palestinian territory

Ansam Sawalha, Maather Sawalha, Randa Rajabi

## Abstract

**Background** Iodination of table salt (salt for table use) is one of the best methods to eliminate iodine deficiency disorders (IDDs) and associated thyroid diseases. Iodate and iodide levels in table salt may vary for many reasons. There are no studies of the concentration of iodine in salt packs on the shelf and in use (open packs). This study aimed to quantify iodine in salt from twelve brands on the Palestinian market, either produced locally or imported, and both on the shelf and in use (opened).

**Methods** Samples of table salt (99) were collected from randomly selected market places and households in eleven governorates of the occupied Palestinian territory. From each household, three samples were collected; the first when the consumer started to use the salt package, the second when the package was half consumed, and the third when the package was almost empty. In addition, 12 salt packages were purchased from a local market, one package for each studied brand. The samples were treated and the absorbance of iodate in the sample was measured using a spectrophotometer at 665.6 nm, based on a previous method. In brief, a specific mass of salt was dissolved, then potassium iodide, hydrochloric acid, methylene blue, and acetate buffer (pH 4) were added. The solution was mixed and diluted. A reference solution using 99% sodium chloride was also created with this method. Finally, the absorbance of iodate was measured, and the iodate concentration obtained by subtracting the absorbance of the sample solution from that of the reference solution. The iodate content was then compared to the content printed on the salt package. Iodine content was also quantified for a number of samples after exposure to oven heat or being boiled or heated in water, as well as after exposure to light or dark.

**Findings** Of the 99 samples, 23 had lost 61% of their iodine content, 28 had lost 80%, and nine had lost all of their iodine. A little less than half (43 of 93) of the samples followed the Palestinian Standard regarding iodine content (3.5–5.5 mg per 100 g), and 70% (69 of 99) complied with the UNICEF recommendation (1.5 mg per 100 g). Iodine content in a newly opened pack (measured immediately after opening) was different from samples taken when the pack was half full, and when the pack was almost empty (0.023 mg/g, 0.0206 mg/g, and 0.0195 mg/g, respectively). The study also showed that up to 68% of iodine was lost during heating in a water solution, whereas dry heat led to a loss of 26%. Iodine loss was higher in light than in dark storage conditions (its concentration dropped from 48.2 mg/kg to 23.6 mg/kg in the dark, and decreased to 22.2 mg/kg in light).

**Interpretation** A significant proportion of iodine is lost from salt after production and during consumption. There should be more awareness regarding the importance of using iodised salt, and education for consumers about salt storage. The iodine content in salt packages should be monitored by regulatory authorities.

**Funding** None.

## Contributors

AS contributed to the study design and data analysis, and wrote the Abstract. MS contributed to the study design and data analysis, carried out data interpretation, produced tables and figures, and contributed to revision of the Abstract. RR analysed and managed the data, and contributed to data collection and revision of the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

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# Demographics of consanguinity in Palestinians with orofacial clefts: a non-randomised longitudinal study

Hassan J Zawahrah, Meredith G Moore, Omar Saeed, Moath Tayem, Hashem Shahin, John A van Aalst

## Abstract

**Background** Orofacial clefts (OFCs) are the most common craniofacial malformation at birth worldwide, with an incidence of 1·05 out of 1000 live births in the occupied Palestinian territory. The majority of OFCs present as singletons (without a family history of clefts), and a minority present as multiplex cases (greater than one OFC in the family). Consanguineous marriages (marriage between blood relatives) among Palestinians is approximately 40%. This study aims to define the incidence and impact of multiplicity in Palestinians with OFC, and to determine how this may be related to rates of consanguinity.

**Methods** We conducted a non-randomised longitudinal study using a 700-question survey administered in colloquial Arabic to mothers of patients with congenital anomalies (including patients with any craniofacial anomaly). Volunteer researchers fluent in English and Arabic were trained to recruit participants and administer surveys during craniofacial surgery screening events in Palestinian Government Hospitals. Selection criteria were a child in the family with an orofacial cleft, and family consent for participation in the survey. In a non-probability sampling method, the frequency of OFC in immediate and distant family members, and the extent of consanguineous marriages, were documented. Comparisons were made using chi squared tests;  $p < 0·05$  was considered statistically significant. The study methods and questionnaire were approved by the Institutional Review Board of Cincinnati Children's Hospital Medical Complex (IRB 2015-0607). Informed written consent was obtained from participants and legal guardians.

**Findings** Of 613 completed surveys, 536 reported OFC, among whom 265 families (46%) reported another family member with a cleft, and 271 did not. Among multiplex families, 26% of OFCs (69 of 265) were in first-degree relatives (parents or siblings), 74% (196) in distant relatives, and 15% (39) in both. Nearly half of the patients from multiplex families (118) represented 42 families with multiple clefts. Compared with families in which only one member had a cleft, patients from multiplex families were more likely to be diagnosed with a cleft lip (29% vs 18%;  $p < 0·01$ ), less likely to be diagnosed with a cleft lip and palate (37% vs 48%;  $p = 0·02$ ), and had a similar likelihood of being diagnosed with a cleft palate alone. Patients from multiplex families were more likely to come from Hebron (52%) than from any other city in the West Bank (39%;  $p < 0·01$ ), and were more likely to have family members with non-cleft birth anomalies (61% vs 13%;  $p < 0·001$ ). Parents of children with clefts in a multiplex family were more likely to be consanguineous (related to each other) than parents of singletons (60% vs 40%;  $p < 0·01$ ).

**Interpretation** The percentage of multiplex families (46%) in this study appears to be higher than reported previously from the Middle East (including Iran and Saudi Arabia). There also appears to be a higher rate of consanguinity among multiplex families than reported previously, especially among those families with an additional sibling diagnosed with a cleft lip.

**Funding** National Institute of Dental and Craniofacial Research (NIDCR) R56.

## Contributors

JvA designed the study. HZ and MT collected data. HZ, MM, OS, HS, and JvA analysed data. HZ, MM, OS, MT, and JvA interpreted data. HZ, MM, OS, and JvA drafted the Abstract. HZ and JvA revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Barriers to care in a West Bank refugee camp: a qualitative study

Bram P Wispelwey, Nashat Jawabreh, Shatha Alazzeah, David Scales

## Abstract

**Background** Health-care delivery is fragmented owing to poorly connected health systems in the occupied Palestinian territory. Palestinian refugees are particularly vulnerable. Aida Camp in Bethlehem (with a population of approximately 6000 people) hosts refugees from 27 villages in what is now Israel. There is no clinic within Aida Camp, and health-care access is a longstanding community concern. This study aimed to elucidate refugees' perceptions of the following topics in focus group discussions, with the goal of developing interventions in a spirit of community-based praxis: (1) community health burdens; (2) access to health facilities; (3) barriers to care; and (4) engagement of community health workers as a means of addressing gaps in care.

**Methods** Focus group interviews with male and female refugees living in Aida Camp were conducted from December, 2016, to February, 2017. Participants were targeted using flyers and internet advertisements. Only Palestinian refugees currently living in Aida Camp and aged 18–75 years were included, and a total of 54 participants were interviewed. Sessions lasted 90–120 min, with 12 to 16 open-ended questions and facilitated discussion among eight to ten participants. Six focus groups were required to reach thematic saturation. Translated transcripts of discussions were coded and analysed. Institutional review board approval was not required for this work. Informed verbal consent was obtained for all participants.

**Findings** The health issues considered to be most burdensome among Aida Camp inhabitants were diabetes, hypertension, cancer, and depression, with additional focus on physical and mental trauma owing to incursions from Israeli forces. Regarding barriers to health, five principle themes were identified: military occupation, poverty, health system and provider distrust, trauma and psychological impact, and lack of a sense of agency. A community conceptual framework and flow chart were developed from the results.

**Interpretation** Aida Camp residents have strong opinions on and novel ideas for addressing common illnesses and barriers to healthcare. A community health worker programme is appealing to adult residents of the camp. A focus on social accompaniment may be an innovative intervention to improve management of non-communicable diseases, implement trauma-informed mental health care, and address social and political determinants of health.

**Funding** 1for3 and Lajee Center.

### Contributors

BW wrote the Abstract with input from DS. SA and NJ facilitated the focus groups. BW and DS coded and analysed the data. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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# Agency and activism in school-aged children as protective factors against ongoing war trauma and political violence in the Gaza Strip: a qualitative study

Guido Veronese, Alessandro Pepe, Alaa Jaradah, Feda Murannak, Housam Hamdouna

## Abstract

**Background** This exploratory qualitative study investigated self-perceived risk and protection factors that can determine the ability of children living in the Gaza Strip to adjust to a traumatic and risky life context characterised by loss and dispossession.

**Methods** A cluster sampling procedure was used to represent refugee children from four areas of the Gaza Strip (North Gaza, Gaza, Dheir el-Balat, and Rafah). The sample comprised 200 Palestinian children recruited at primary schools in four refugee camps (Bureij, Gaza Beach Camp, Jabalia, and Rafah Camp) in the Gaza Strip in 2012. Of these children, 104 were boys (mean age 8·6 years [SD 2·3], range 6–11) and 96 girls (9·6 years [2·7], 6–11). The children were engaged in activities aimed at eliciting narratives of military violence and traumatic experiences, and individual, familial, and community-related resources that they had mobilised during the war to cope with traumas. Thematic content analysis was applied to written materials and narratives using Nvivo10 software. The main objective was to identify in detail the dimensions of wellbeing present in the narratives, and perceptions of risk and protective factors. The inter-rater agreement ranged from 74% to 95%.

**Findings** Both boys (78%; 81 of 104) and girls (52%; 50 of 96) reported having directly experienced traumatic events related to war, episodes of political violence (39% of boys [41 of 104], 38% of girls [36 of 96]), domestic violence (31% of boys [32 of 104], 3% of girls [three of 96]), or community violence (6% of boys [six of 104], 2% of girls [two of 96]). Thematic content analysis led to the identification of ten main themes: relationship with peers, family, and other significant adults, affect balance, constraints on movement, play, health, school, personal satisfaction, and spirituality. In boys, the most severe self-reported risks were related to constraints on movement and affect balance, followed by relationship with family, and health. Play, personal resources, relationship with other significant adults, and school were perceived to be protective factors. The girls reported more sources of protection than risks, conversely, boys perceived themselves to be more at risk than protected.

**Interpretation** Children deal with ongoing suffering and discomfort by means of subjective and intersubjective agency in multiple domains of their life, showing psychological adaptability.

**Funding** None.

## Contributors

GV designed the research, analysed the data, and wrote the Abstract. AP analysed the data and revised the Abstract. FM, AJ, and HA collected the data and revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

## Declaration of interests

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# Assessment of the knowledge, attitudes, and practices among UNRWA health staff in Jordan concerning mental health programme pre-implementation: a cross-sectional study

Yassir Turki, Suha Saleh, Shatha Albaik, Yasmeen Barham, Dorien van de Vrie, Yousef Shahin, Majed Hababeh, Akihiro Seit

## Abstract

**Background** Mental health is a major public health priority, particularly among refugees worldwide. The United Nations Relief and Works Agency for Palestine Refugees (UNRWA) started to integrate mental health and psychosocial support (MHPSS) into its primary health-care services in Jordan in late 2017. This baseline study aimed to assess the knowledge, attitudes, practices, and perceived barriers among UNRWA health staff regarding the implementation of the MHPSS programme.

**Methods** The UNRWA Health Programme conducted a cross-sectional study of a sample of 220 out of the 390 male and female doctors, dentists, nurses, and midwives who work at 16 of the 25 UNRWA health centres in Jordan during November, 2017. Individuals on duty at the health centres on the day of the survey were included. The 16 health centres were selected based on their size and accessibility to surveyors (reflecting proximity to Amman, and the size of population served). Of the selected health centres, seven were large, seven were medium, and two were small according to the UNRWA classification of health centres (based on the number of medical doctors). A validated self-administered questionnaire was used. Ethics approval was granted by the UNRWA Health Programme ethics committee, and informed written consent was obtained from all participants. Data analysis was performed using SPSS (version 22).

**Findings** Of the participants, 73% (161 of 220) believed that their knowledge of MHPSS programmes was insufficient, with no significant difference ( $p=0.116$ ) between different categories of staff. Furthermore, 88% (194 of 220) said that they needed more training, 67% (147 of 220) reported that the number of mental health cases is increasing, and 50% (110 of 220) that dealing with these cases is difficult. Reflecting on the past 12 months, 31% of staff (69 out of 220) reported meeting between one and ten children, and 45% (100 out of 220) reported meeting between one and ten adults suspected of having mental illnesses. The most suspected condition was depression (84%; 150 of 220), followed by epilepsy (64%; 140 of 220). The main perceived barriers to implementation included the limited availability of MHPSS policies (87%; 192 of 220), MH professionals (86%; 190 of 220), resources (86%; 189 out of 220), and lack of privacy (14%; 31 out of 220).

**Interpretation** Most health staff had positive attitudes towards MHPSS programme implementation but felt they lacked the required knowledge. There is a need for training and clear technical guidelines. Perceived barriers to MHPSS programme implementation need to be tackled with a structured plan of action.

**Funding** The UNRWA Health Programme, UNRWA Headquarters, Amman, Jordan.

## Contributors

YT designed the study, interpreted data and wrote the Abstract. SS collected, analysed, and interpreted data, produced tables and figures, and wrote the Abstract. SA collected, analysed, and interpreted data, carried out data management, and wrote the Abstract. YB collected data, and contributed to data analysis. DV designed the study and contributed to data analysis. YS interpreted the data and revised the Abstract. MH interpreted data and revised the Abstract. AS interpreted data and revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

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# Prevalence of exclusive breastfeeding and associated factors among refugees from Palestine in Jordan: a cross-sectional study

Kumiko Takai, Yasuhiko Kamiya, Majed Hababeh, Ali Khader, Akiko Kitamura, Wafaa Zeidan, Akihiro Seita

## Abstract

**Background** WHO and UNICEF recommend early initiation of breastfeeding, within the first hour after delivery, and exclusive breastfeeding (EBF) in the first 6 months of infant life. The most recent data available (from 2001) show that the EBF prevalence among Palestinian refugee infants under 4 months in Jordan was 24%. The study objectives were to estimate the current prevalence of EBF and early initiation, and to examine factors associated with EBF among refugees from Palestine in Jordan registered with UNRWA.

**Methods** A cross-sectional facility-based study was conducted between April and June, 2017, in all areas of operation of UNRWA in Jordan; North Amman, South Amman, Irbid, and Zarqa. The study targeted Palestinian refugee mothers of children under 6 months of age surveyed at five UNRWA health centres. One health centre was randomly selected from each area (but two from Zarqa) with proportionate probability, excluding those for which there were problems of accessibility. All eligible mothers who attended maternal and child health services on the day of the survey and agreed to participate were recruited, and the process repeated until the required number of participants was achieved. A structured questionnaire was used to collect data. We used the WHO definition of EBF to measure the proportion of infants under 6 months of age that were breastfed exclusively in the previous 24 hours. Bivariate and multivariate logistic regression analysis were employed to identify the independent predictors of EBF. The study protocol was approved by UNRWA and Nagasaki University. Informed written consent was obtained from each participant prior to the interview.

**Findings** A total of 307 participants (mean age, 27·4 years; range 17–45) were included in the analysis. Nearly one third (31%; 95 out of 307) lived in a refugee camp. The prevalence of EBF in infants under 6 months was 34% (105 out of 307; 95% CI 29–40), and 49% (148 out of 307; 95% CI 43–54) of mothers started breastfeeding within 1 hour after delivery. The rate of EBF was significantly higher in younger infants. Multiparous mothers (adjusted odds ratio 2·38; 95% CI 1·23–4·59) and mothers who did not have problems with breastfeeding (2·12; 95% CI, 1·25–3·57) were more likely to breastfeed exclusively.

**Interpretation** The prevalence of EBF has improved since 2001, but is still below the WHO recommendation of 50%. Providing adequate support, especially to first-time mothers, mothers who have problems (eg, difficulty in latching on and mastitis), and mothers of older infants, may be a feasible strategy to improve the prevalence of EBF among refugees from Palestine in Jordan.

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### Contributors

KT analysed data, carried out data management, and wrote the Abstract, under the supervision of YK. KT, YK, MH, A Khader, A Kitamura, WZ, and AS designed the study. KT, MH, A Khader, WZ, A Kitamura, and AS collected and interpreted data. A Kitamura revised the Abstract. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

AS is the Director of the Department of Health at UNRWA Headquarters. KT is a former intern, and MH, A Khader, A Kitamura, and WZ are employees of UNRWA.

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# Prevalence and antibiotic susceptibility of bacterial pathogens at a tertiary care hospital in Nablus, occupied Palestinian territory: a cross-sectional survey

Adham Abu Taha, Zuhoor Atia, Razan Naji

## Abstract

**Background** The increasing incidence of hospital-acquired infections caused by antibiotic-resistant pathogens has led to an increase in morbidity and mortality worldwide. The aim of this study was to assess the frequency and antibiotic susceptibility of bacterial pathogens isolated at An-Najah National University Hospital (NNUH) in Nablus city in the occupied Palestinian territory during 2015.

**Methods** A retrospective study was conducted of all positive bacterial cultures obtained from the microbiology laboratory of NNUH. Results of culture and sensitivity of patients' specimens were analysed. Approval was obtained from the institutional review board of An-Najah National University.

**Findings** Of the 4421 cultures processed, 1335 (30·2%) were positive. 621 (46·4%) bacterial isolates were Gram-positive, 565 (42·3%) were Gram-negative organisms and 151 (11·3%) were *Candida* species. The most frequent Gram-positive organisms were coagulase-negative *Staphylococci* (CoNS) and *Enterococcus* species, followed by *Staphylococcus aureus* (50·2%, 25·0%, and 14·8%, respectively). *Enterococcus coli* was the most frequent Gram-negative organism followed by *Klebsiella pneumoniae*, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa* (28·3%, 21·0%, 18·4%, and 18·4%, respectively). CoNS showed high resistance to oxacillin (89%) and erythromycin (74·6%). *Enterococcus* spp had the highest resistance to clindamycin (93·5%), followed by tetracycline (85·7%), and erythromycin (74·6%). *S aureus* isolates were resistant to oxacillin (56·0%) and erythromycin (52·0%). *E coli* showed high resistance to ampicillin (90·1%), ceftriaxone (77·0%), fluoroquinolones (eg, ciprofloxacin; 75·0%), and erythromycin (70·2%). *K pneumoniae* was mostly resistant to ampicillin (100·0%), aztreonam (83·3%), and third generation cephalosporins (ceftriaxone, 80·9%; ceftazidime, 78·2%; and cefotaxime, 77·2%). *Pseudomonas aeruginosa* showed high resistance to tigecycline (95·4%), ceftriaxone (94·1%), and cefotaxime (95·4%). A *baumannii* was resistant to all tested antibiotics—including amikacin, cephalosporins, fluoroquinolones, and carbapenems—except tetracycline.

**Interpretation** The high rates of antibiotic resistance are a cause for concern. Similar studies should be carried out at all hospitals in Palestine in an effort to control the development of antibiotic resistance and the spread of these multidrug-resistant organisms.

**Funding** An-Najah National University.

### Contributors

AAT conceived the idea and wrote the Abstract. ZA and RN collected and analysed the data. All authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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# Towards a global health practice based on the liberation and sovereignty of populations under siege: a theoretical analysis

Ron J Smith

## Abstract

**Background** The 1990s were dubbed the sanctions decade, typified by the situation in Iraq. The past 10 years have seen continued use of siege, ostensibly in the interest of promoting political change. For this decade, the Gaza Strip has been the model of siege. Siege regimes have also been imposed on Yemen, and to a lesser extent on Qatar, Iran, and areas of Syria. This paper examines the consequences of siege for those in the field of health-care provision, and what responsibilities medical staff have in the face of the human rights crises that accompany siege. Can public health needs be served without an explicit agenda that promotes sovereignty and liberation of populations under siege?

**Methods** The primary source of data for this paper is secondary literature, popular media and non-governmental organisation (NGO) reports dealing with the effects of siege on health-care provision in Gaza, Yemen, Iraq during the Sanctions period, and Iran. These primary data are supported by participant observation and interviews with medical staff in the Gaza Strip. These data were analysed using a critical political economy framework. Ethics approval was obtained from the Institutional Review Board of Bucknell University.

**Findings** Siege continues to be promoted as an alternative to warfare in the press and in academic writing. Medical and other NGOs document the strain that blockades represent as they record the extent of health-care crises, but they do not confront the coalitions that impose siege. Discussions of the importance of sovereignty to the promotion of health care remain sidelined within a discourse of wars on terror.

**Interpretation** Familiarity and engagement with geopolitical practices of isolation and resistance is important for health-care providers in territories under siege. As health-care providers represent front line witnesses of the effects of siege on local populations, their testimonies represent a substantial challenge to the status quo. International and local health workers should coordinate with activists and academics to create a global health paradigm of liberation by promoting local sovereignty and international solidarity.

**Funding** Bucknell University.

### Contributors

RJS designed the study, collected, analysed, and interpreted data, and wrote the Abstract.

### Declaration of interests

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# Knowledge, attitudes, and practices of community pharmacists in relation to generic medicines in Palestine: a cross-sectional study

Naser Shraim, Tasneem Al Taha, Rawan Qawasmeh, Hiba Jarrar, Maram Shtaya, Lama Shayeb, Waleed Sweileh

## Abstract

**Background** Generic substitution of medicines has become common practice in many countries and is considered to be a key method to contain pharmaceutical expenditure without compromising health-care quality. However, the safety and quality of generic products are of concern to health professionals. This study aimed to investigate community pharmacists' knowledge, attitudes, and practices in relation to generic medicines in Palestine.

**Methods** A cross-sectional observational study was carried out using a convenience sampling technique to distribute a data collection form to practicing pharmacists in the West Bank. In Palestine, the majority of pharmacists work in private retail pharmacies called community pharmacies. Other forms of professional pharmacy in Palestine include pharmacists in industry, in the regulatory governmental sector, and in hospitals and other clinical settings. Here, a sample of licensed community pharmacists completed the questionnaire, which consisted of four main sections: demographic and practice details of the participants, and their knowledge of, attitudes towards, and factors influencing their selection and dispensing of generic medicines. The Mann–Whitney U test or Kruskal–Wallis test were used, as appropriate. A p value of less than 0.05 was considered significant.

**Findings** A total of 302 community pharmacists were interviewed, of whom 52% (157 out of 302) were male. The participants' mean knowledge score in relation to generic medicines was 5.91 (SD 1.27), and the highest score was 8 out of 10 (the maximum possible score was 10). Knowledge score was not significantly associated with any of the sociodemographic characteristics. Most pharmacists in the study (87%; 264 out of 302) agreed that they should be given the right to substitute with generic medicines, and the majority (62%; 188 out of 302) supported generic substitution for brand name drugs in all situations in which a generic medicine is available. The main two factors affecting pharmacists' selection and dispensing of generic medicines were personal faith in the product (86%; 260 of 302) and cost effectiveness of generic medicines (84%; 269 of 302).

**Interpretation** Participant community pharmacists in Palestine had basic knowledge with regard to generic medicines. In particular, their knowledge score pertaining to the technical and regulatory aspects of bioequivalence and pharmacokinetic parameters was insufficient. These data suggest a demand for interventions to develop pharmacists' awareness of these important matters underlying the safety, quality, and efficacy of generic medicines.

## Funding None.

### Contributors

NS conceived the idea for the study, led study design and data collection, conducted the statistical analyses, interpreted the data, and drafted the Abstract. WS interpreted the data and drafted the Abstract. TA, RQ, HJ, MS, and LS collected the data, entered the data into SPSS, and contributed to the statistical analyses.

### Declaration of interests

We declare no competing interests.

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# The relationship between leader–member exchange, organisational citizenship behaviour, and organisational commitment among UNRWA health staff in the Gaza governorates

Tamer El Shaer

## Abstract

**Background** Leader–member exchange (the relationship between the manager and his or her employees) is important for the sustained growth of any organisation, and contributes to the organisation's goals and achievements. This study explores the relationship between leader–member exchange and two managerial domains—organisational citizenship behaviour and organisational commitment—among UNRWA health staff in Gaza governorates.

**Methods** A triangulated study design was used. Self-administered questionnaires were completed by 315 employees; a response rate of 93% (291 of 315). The data collector used the international scales for leader–member exchange, organisational commitment and organisational citizenship behaviour. In addition, seven key informant interviews and two focus groups with employees (18 across the two groups) were conducted. Informed written consent was obtained from all participants.

**Findings** There were high scores in leader–member exchange (77% of employees [241 of 315] scored 4 and 5 on the Likert scale of 1 to 5), organisational commitment (76%; 239 of 315), and particularly in organisational citizenship behaviour (86%; 270 of 315). We also scored factors influencing these three main dimensions (for example, for leader–member exchange, the factors scored were affect, loyalty, perceived contribution, and professional respect). For leader–member exchange, affect (mutual affection or interpersonal attraction influencing cooperation) scored the highest (83%; 260 of 315). Within organisational commitment, normative commitment (sense of duty, obligation, and loyalty towards the organisation) scored the highest (78%; 245 of 315). With regard to organisational citizenship behaviour, courtesy (discretionary behaviour to avoid work-related conflict) scored the highest (91%; 286 of 315). Inferential analysis showed that employees holding lower qualifications (secondary school and below), those who intended to stay at UNRWA until retirement, and those who performed higher in appraisals (those achieving “best performer” status, as opposed to “fully meets expectations” or “does not fully meet expectations”) had statistically higher mean scores in leader–member exchange than their colleagues. Findings also show that employees older than 45 years, those with more than 20 years' experience, and those intending to stay at UNRWA until retirement had statistically higher scores in organisational commitment and organisational citizenship behaviour than their colleagues. There were no statistically significant differences in the scores of the three scales in relation to participants' gender, marital status, place of work, level of the health centre (main health centre or small health centre [sub-centre]) and job position. However, there were significant correlations between leader–member exchange and the two other managerial domains: organisational commitment and organisational citizenship behaviour. This suggests that if the leader–member exchange approach is positively perceived by employees, it would be associated with high organisational commitment and high organisational citizenship behaviour. In addition, there was overall satisfaction with respect to specific work-related variables.

**Interpretation** Leader–member exchange, organisational commitment, and organisational citizenship behaviour are high among UNRWA employees. However, there is room for improvement. It is important to monitor these important morale-related issues and to constantly consider means to improve managerial practices, especially supervision, considering that supervision is key in leader–member exchange.

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### Contributors

TES designed the study, collected, analysed, and interpreted data, and wrote the Abstract.

### Declaration of interests

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