



# 10-year clinical records of adults seeking individual therapy in a non-profit centre in the West Bank, and factors associated with premature discontinuation: a quantitative study

Layaly Hamayel, Rana Nashashibi, Nisreen Bosheyeh, Bashar Batrawi

## Abstract

**Background** Formal help-seeking behaviour and premature termination of therapy is influenced by several factors, including access to mental health services, cultural beliefs about mental health and illness, gender, and socioeconomic status. Current local and regional studies have focused on formal help-seeking attitudes of university students or on utilisation of psychiatric services. This study sheds light on actual formal help-seeking behaviours of adults attending a non-profit counselling centre in Palestine by use of both client and therapist reports.

**Methods** The sample consisted of 1068 clinical records belonging to clients aged 18 years and older, who approached the Palestinian Counseling Center for individual therapy between 2008 and 2018 in three different locations in the West Bank. The Birzeit University Ethical Committee approved the study and granted a waiver for obtaining consent owing to the use of an anonymous secondary dataset. 12 quantitative variables describing clients' demographic information and data on therapy and dropout were analysed using binary logistic regression. One qualitative variable describing patients' subjective reports about their symptoms was analysed using thematic analysis with an inter-rater reliability of 65%.

**Findings** 70·3% of clients (750 of 1067) were women, 44·1% (471) were married, and 42·2% (450) had never married. The mean age was 30·4 years (SD 9·7). 42·3% of clients (280 of 661) had a BA degree or higher and 60·5% (633 of 1045) reported their economic status to be above average. 45·2% (457 of 1011) were working, 25·4% (257) were housewives, and the rest (297) were students or unemployed. 56·7% of clients (587 of 1036) were from cities and 38·6% (400) from rural areas. A large proportion of clients approached the Palestinian Counseling Center on their own (39·9%, 411 of 1030), and others were referred by friends (19·2%, 198) and doctors (19·0%, 196). The qualitative data show that the most common complaints reported by clients were relational problems (51·6%, 297 of 575) and anxiety (33·6%, 193). The most frequent diagnoses made by clinicians were anxiety disorders (20·9%, 196 of 939), personality disorders (20·7%, 194), depressive disorders (19·2%, 180), and other conditions with a clinical focus (18·2%, 171). The average number of sessions was 23·1 (SD 20·9), and the rate of premature discontinuation was 39·4% (392 of 994). Clients with very low education (illiterate or primary education level) were 4·1 times (95% CI 1·09–15·48) as likely as clients with a BA degree or higher to discontinue therapy prematurely ( $p=0\cdot036$ ). Clients that approached the centre on their own were 56·6% (95% CI 0·24–0·8) less likely to discontinue prematurely than those referred by institutions or professionals ( $p=0\cdot008$ ).

**Interpretation** The predominance of women and clients with higher education and economic status is consistent with previous findings. These groups tend to have better access or more positive attitudes, or both, to therapy use. Furthermore, previous studies reported a similar dropout rate and a link between lower education and premature discontinuation. The percentage of clients diagnosed with personality disorders and the percentage of married clients was higher than predicted. The main limitation of the study is the location of the Palestinian Counselling Center clinics in cities, and the fee that clients pay (calculated based on their financial ability), affect access to therapy, utilisation, and discontinuation. Analysing the clinical records of other Palestinian centres and institutions is necessary to understand whether the patterns reported by this study are generalisable to the Palestinian population.

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### Contributors

LH and BB completed the data collection and statistical analysis. LH wrote the Abstract with input from RN and NB on the interpretation and presentation of findings. All authors have seen and approved the final version of the Abstract for publication.

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# Adherence to US Center for Disease Control and Prevention infection control guidelines in the haemodialysis care unit at Dar Al-Shifa Hospital in the Gaza Strip: a clinical audit

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## Abstract

**Background** Infection is the most common cause of admission to hospital and the second most common cause of mortality in patients requiring renal haemodialysis, who have an increased risk of infection due to frequent use of intravenous cannulas or catheters. This audit aimed to assess current clinical practice at a dialysis unit in the Gaza Strip by use of the US Center for Disease Control and Prevention's guidelines for asepsis when dealing with haemodialysis catheters.

**Methods** A clinical audit was done at the haemodialysis unit of the Dar Al-Shifa Hospital. Data were collected in four categories: first, haemodialysis catheter connection and disconnection; second, haemodialysis catheter exit site care; third, dialysis station routine disinfection; and fourth, haemodialysis injectable medication preparation and administration. There was no overlap between the four groups. A data collection sheet was adopted from US Center for Disease Control and Prevention guidelines and data were collected prospectively between April and November, 2018, through direct observation of care by ML.

**Findings** The total number of patients seen was 250, and the total number of dialysis station routine disinfection sessions observed was 20. In the first category of data (haemodialysis catheter connection and disconnection; n=100 patients), adherence to hand hygiene by the health-care professional was observed in the care of 3 (3%) patients, and adherence to the use of gloves by the health-care professional was seen with 14 (14%) patients. With 74 (74%) of the patients, catheters were connected aseptically from blood lines, and for 58 (58%) patients, catheters were disconnected aseptically from blood lines. After catheter disconnection, adherence to catheter clamping and cap removal was seen for 98 (98%) patients, but only for 34 (34%) patients were catheters attached to new caps aseptically during disconnection. In the second category (catheter exit site care; n=50 patients), adherence to hand hygiene by the health-care professional was seen for the care of one (2%) patient, adherence to the use of gloves was seen for one (2%) patient, and application of skin antiseptics and of antimicrobial ointments was not observed. Moreover, for 35 (70%) patients, procedures were done with no direct contact with the catheter exit site, and for 40 (80%) patients, dressings were applied aseptically. In the third category (dialysis station routine disinfection; n=20 sessions), the adherence to guidelines for catheter disconnection and removal of used blood tubes and dialysers from the machine, disposal in a leak-proof container, and confirmation of patient exit from the dialysis station before beginning routine disinfection of the dialysis station was 100%. However, adherence to confirmation that no visible blood or other contaminants remained on surfaces and that the priming bucket had been emptied was 0%. Additionally, adherence to application of disinfectants to all surfaces in the dialysis station after the patient had left the station was observed after the care of 18 (90%) patients, and adherence to the use of gloves and hand hygiene by the health-care professional was seen after the care of six (3%) patients. In the fourth category (haemodialysis injectable medication preparation and administration; n=100 patients), adherence to the use of new needles and syringes, preparing medications aseptically, and safely discarding vials in the sharp box was done for 100 (100%) patients. During administration, adherence to aseptic attachment of syringes and administration of medication was observed for the care of 80 (80%) patients, and adherence to aseptic disposal was observed for the care of 100 (100%) patients. However, there was no adherence to the use of gloves and hand hygiene.

**Interpretation** Health-care staff at Dar Al-Shifa Hospital showed good adherence to guidelines in some aspects of care, such as in preparation and administration of medications and in the cleaning of dialysis machine surfaces and stations, but poor adherence to hand hygiene, use of gloves, and application of aseptic dressings was poor. Poor adherence to safety of care can negatively affect overall health outcomes for patients requiring haemodialysis. We recommend staff training on the aseptic aspects of care during and after haemodialysis, and re-audits for the evaluation of the desired optimal outcomes.

## Contributors

EA provided the concept for this study. ML and EA collected the data. ML did the data analysis and wrote the abstract. BB provided supervision. All authors contributed to the analysis, interpretation, and discussion of results. All authors have seen and approved the final version of the Abstract for publication. All authors had full access to all the data in this Abstract and had final responsibility for the decision to submit for publication.

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# Agency and life satisfaction in Bedouin children in occupied Palestinian territory: a cross-lagged longitudinal study

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## Abstract

**Background** Bedouin children living in occupied Palestinian territory are at risk of developing trauma-related pathologies because of chronic exposure to political and military violence. Little is known about psychological wellbeing and life satisfaction in this group of children, or their coping skills and survival skills in adjusting to these conditions.

**Methods** Our longitudinal study aimed to assess the function of agency in predicting life satisfaction as a moderator for traumatic stress. We reasoned that the more that children show agency over time in activating domains of life satisfaction, the more they can be satisfied with their life and the less they will present signs of trauma. A cross-lagged path model (CLPM) was used to assess 143 children living in Bedouin communities located northeast of Jerusalem (area E1, Al Khan Al-Ahmar). The CLPM, a discrete time structural equation model to analyse panel data in which two or more variables are repeatedly measured at different timepoints, was run in January, 2019 (Time 1) and after 6 months (Time 2). We used the Children's Hope Scale (CHS) as a measure of agency, the Multidimensional Student Life Satisfaction Scale (MSLSS), and the Children's Revised Impact of Event Scale (CRIES).

**Findings** The mean age of participants was 12.02 years (SD 2.05); 65 (46%) were male and 78 (55%) were female. Agency scores had a medium total positive standardised effect on life satisfaction ( $\beta=0.25$  [95% CI 0.149 to 0.449];  $p=0.004$ ) and a small direct standardized effect on trauma symptoms ( $\beta=0.08$  [0.139 to 0.450];  $p=0.023$ ). The indirect effect of agency on trauma was  $-0.04$  (95% CI  $-0.119$  to  $-0.101$ );  $p=0.044$ ). Life satisfaction had a small statistically significant effect on trauma ( $\beta=-0.17$  [ $-0.484$  to  $-0.191$ ];  $p=0.037$ ). Statistically significant total standardised effects were found between agency, life satisfaction ( $\beta=0.25$  [0.161 to 0.476];  $p=0.010$ ), and trauma symptoms ( $\beta=-0.13$  [ $-0.317$  to  $0.203$ ];  $p=0.044$ ) at Time 1. Similarly, agentic competencies were found to be more related to life satisfaction ( $\beta=0.14$  [0.025 to 0.338];  $p=0.047$ ;) than to trauma symptoms ( $\beta=-0.10$  [ $-0.543$  to  $0.036$ ];  $p=0.145$ ) at Time 2. The inclusion of the cross-lagged paths increased the fit of the model significantly.

**Interpretation** Children are acting for their wellbeing, mobilising personal and contextual resources. Such agentic attitudes contribute to easing their lives under occupation and minimising negative effects on their mental health despite the prevailing chronic traumatic conditions. Children implement skills of resilience rather than yield to the negative effects of political and military violence. The more that children perceive themselves as agentic in activating life satisfaction, the more effectively they deploy their survival skills and resilience.

**Funding** None.

### Contributors

GV planned the research, devised the statistical analysis, and wrote the first draft of the Abstract. AP did the statistical analysis. FC, HK, HO, MM, and JP contributed to writing of the Abstract. All authors have seen and approved the final version of the Abstract for publication.

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# Antimicrobial resistance in bacteria isolated from blood cultures from babies with sepsis in neonatal intensive care units in the Gaza Strip: a cross-sectional study

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## Abstract

**Background** Neonates are vulnerable and can quickly develop septicaemia and sepsis. We investigated patterns of bacterial isolates and local antimicrobial resistance in neonates with sepsis.

**Methods** This was a hospital-based, cross-sectional study that was done from Nov 1, 2017, to March 31, 2019, in all neonatal intensive care units in Gaza Strip. Neonates with clinical signs of early or lately sepsis were included. A standard disc diffusion technique was used to identify antibiotic resistance after identifying the bacterial isolates from routinely collected blood specimens. All laboratory results for the study variables were documented in a standardised data collection sheet. Characteristics of patients were obtained from the patients' culture request forms and case notes without access to identifying information. Ethics approval for the study was obtained from the Palestinian Ministry of Health.

**Findings** 4151 blood specimens were screened, and bacterial growth was detected in 333 (8.0%). The main isolated bacteria were coagulase-negative staphylococci (CoNS) in 81 (24.3%) samples, *Staphylococcus aureus* in 65 (19.5%), *Escherichia coli* in 46 (13.8%), *Acinetobacter* sp in 39 (11.7%), and *Klebsiella* sp in 25 (7.5%). Resistance rates for CoNS were as follows: ampicillin 75.7% (28 of 37 samples tested), cefalexin 56.3% (36 of 64), ciprofloxacin 18.9% (7 of 37), cefotaxime 18.6% (8 of 43), vancomycin 17.2% (ten of 58), gentamycin 15.7% (eight of 51), and amikacin 5.9% (two of 34). For *S aureus* resistance to ampicillin was seen in 91.7% (22 of 24 samples tested), to ciprofloxacin in 37.5% (15 of 40), to cefotaxime in 37.4% (ten of 27), to gentamycin in 21.4% (six of 28), to vancomycin in 13.3% (four of 30), and to amikacin 6.9% in (two of 29). For *E coli* resistance rates were cefalexin 67.9% (19 of 28), cefotaxime 62.9% (22 of 35), gentamycin 39.3% (11 of 28), ciprofloxacin 24.3% (nine of 37), and amikacin 15.4% (four of 26), with none of 21 samples tested showing resistance to meropenem. Resistance rates for *Acinetobacter* sp were ciprofloxacin 93.8% (30 of 32), meropenem 91.3% (21 of 23), cefotaxime 91.3% (21 of 23), gentamycin 86.7% (26 of 30), and amikacin 71.43% (15 of 21), but none of 27 samples tested showed resistance to colistin. Resistance rates of *Klebsiella* sp were cefalexin 92.9% (13 of 14), cefotaxime 75.0% (12 of 16), gentamycin 50.0% (seven of 14), meropenem 20.0% (two of 10), and amikacin 9.5% (two of 21).

**Interpretation** CoNS, *S aureus*, *E coli*, *Acinetobacter* sp, and *Klebsiella* sp were the leading causes of bacterial neonatal sepsis in this study. They were highly resistant to first-line and second-line antibiotics. So far, these isolated bacteria remain susceptible to third-line antibiotics.

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### Contributors

All authors contributed to data collection. KAEA managed and analysed the data and wrote the Abstract. All authors reviewed and approved the Abstract.

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# Antimicrobial resistance of bacteria isolated at the European Gaza Hospital before and after the Great March of Return protests: a retrospective study

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## Abstract

**Background** The emergence of antimicrobial resistant pathogens is a serious health threat that leads to increased mortality. In 2019, the European Gaza Hospital released medical reports that indicated high multiresistant bacterial isolates during the period of Great March of Return (GMR) Gaza Strip border protests in 2018–19. We investigated resistance to commonly used antibiotics of bacteria isolated at the European Gaza Hospital in the Gaza Strip for 6 months before and 6 months after the GMR.

**Methods** This was a retrospective study done in European Gaza Hospital, which covers three of the five governorates in Gaza Strip. We obtained routine microbiology laboratory results from pus and swab cultures recorded between Aug 1, 2017, and Aug 1, 2018. Data were cross-tabulated and assessed with the  $\chi^2$  test in SPSS version 26.0. Ethics approval was obtained from the Palestinian Ministry of Health. Data were anonymised and, therefore, consent was waived for this study.

**Result** 628 clinical isolates were analysed, 310 (49%) from before and 318 (51%) from after the GMR. 192 (31%) samples were recovered from people injured during the GMR. The predominant Gram-positive isolate recovered was *Staphylococcus aureus* (144 [23%] of 628 samples). Among Gram-negative bacteria, *Pseudomonas aeruginosa* was the most common (138 [22%] of 628 samples), followed by *Klebsiella* sp (113 [18%]), and *Acinetobacter* sp (56 [9%]). Increases in resistance to antibiotics among non-injured patients were seen after the GMR compared with before. For example, resistance to amikacin was 30% before the GMR and 70% after (percentage increase 133%), to doxycycline was 35% and 65%, respectively (increase 87%), and to gentamicin was 16% and 84%, respectively (increase 421%). Striking increases in resistance were also seen among isolates from injured patients, ranging from 4% to erythromycin to 300% to aztreonam and nalidixic acid when compared with isolates from non-injured patients.

**Interpretation** The increase in resistance of bacterial isolates after the GMR might have been due to infections with new bacterial strains that spread easily among patients because of limited human resources, huge numbers of casualties, and improper infection control measures. Regulation of antibiotic prescriptions and use should be enforced to reduce the emergence of resistance. The indiscriminate use of antibiotics should be discouraged through awareness campaigns.

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## Contributors

AKAQ, TMH, and AAE conceived the study. AKAQ and AAE wrote the Abstract. AKAQ collected the data from the European Gaza Hospital, and TMH analysed the data. All authors approved the final version of the Abstract for publication.

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# Attainment of universal health coverage in the occupied Palestinian territory assessed by a general equilibrium approach: is informality an irreversible hurdle for universality?

Mohammad Abu-Zaineh, Sameera Awawda

## Abstract

**Background** Achieving universal health coverage (UHC) has recently received attention in response to calls from international organisations to expand health coverage to hard-to-reach segments of the population (eg, informal workers, and unemployed and poor people). Despite the strong commitment to achieving UHC, its implementation continues to spark vigorous debate among policy makers, scholars, and the international health community. Much of the recent debate has focused on the macro-fiscal challenges that many developing countries face in implementing and sustaining UHC-oriented reforms, and there has also been debate in relation to challenges of the micro-behavioural sphere (at the level of the individual). Some of these challenges pertain to the structure of the labour market in developing countries, which is characterised by the large size of non-contributory segments of the population, mainly informal workers and unemployed individuals. This raises the important policy questions of the feasibility of expanding health coverage to the informal sector and the unemployed on a contributory basis.

**Methods** We assessed the feasibility of UHC using a dynamic general equilibrium approach while accounting for heterogeneity across households in terms of their employment and socioeconomic status. The model was calibrated using the Palestinian Expenditures and Consumption Survey (PECS, 2011), and the Social Accounting Matrix (SAM, 2011). We assessed alternative health insurance designs proposed to target the informal workers. Fiscal sustainability of the reforms was examined using the debt-to-GDP ratio and the microeconomic impact was assessed using the concept of consumption equivalent variation (CEV), defined as the amount of additional consumption a household would give up to move from the pre-insurance to the post-insurance level of welfare. A positive CEV value indicates that individuals are willing to pay for the health insurance. The higher the CEV value, the higher the gains of health insurance.

**Findings** A simultaneous expansion of UHC coverage of the population and health-care costs would enhance welfare for all households. However, such an expansion would reduce government expenditure that is allocated to other sectors; for example, it was estimated that the reduction would have been approximately 10% in 2020. To finance this UHC-driven debt, we examined the impact of a tax-financed UHC-oriented reform and a low-premium, low-coverage government-sponsored health insurance that targets informal workers. Although both policies would generate additional revenues to serve the UHC debt, government-sponsored health insurance targeting informal workers seems to be more feasible in terms of its impact on household welfare. That is, the informal workers would be better off under the government-sponsored health insurance scheme.

**Interpretation** In the absence of precise information on the ability to pay of informal workers, which in some cases might be comparable to that of formal workers, it is reasonable for the government to charge better-off informal workers rather than naively exempting them. The findings corroborate previous evidence suggesting that informal workers are willing to join health insurance schemes that charge them lower premiums for a slightly less generous benefit package than the health insurance schemes of formal workers. This health insurance might be deemed equitable in terms of the degree of financial protection that informal workers can obtain compared with the scenario in which they are left to bear high out-of-pocket health-care costs.

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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.

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We declare no competing interests.

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# Awareness of breast cancer risk factors and clinical presentation among women in occupied Palestinian territory: a cross-sectional study

Haya Shojaia, Ni'meh Al-Shami, Hiba Darwish

## Abstract

**Background** Breast cancer is the most common cancer among Palestinian women and is associated with multiple risk factors. Poor knowledge can result in delayed diagnosis and shortened survival. We assessed knowledge about breast cancer among Palestinian women attending Palestinian Ministry of Health screening clinics.

**Methods** A questionnaire was developed in Arabic based on previous studies. It included questions about sociodemographic status and 20 questions concerning knowledge of risk factors for breast cancer (15 questions) and clinical presentation (five questions). The latter two sets of questions both showed internal consistency with (Cronbach  $\alpha=0.681$  and  $0.688$ , respectively). A qualitative pilot study involving ten women was done to confirm the clarity of the questionnaire and appropriateness for the local context, from which thresholds for good knowledge were set of eleven for risk factors and four for clinical presentation. In the cross-sectional study, telephone interviews were performed with all women who had attended Palestinian Ministry of Health screening clinics in the north, middle, and south of the West Bank from Oct 1 to Dec 30, 2016. Respondents completed the questionnaire after giving verbal consent.  $\chi^2$  testing was used to check for significant associations. Analysis was performed with SPSS version 20. Ethics approval for the study was obtained from the Palestinian Ministry of Health.

**Findings** 444 telephone interviews were completed, 150 (34%) with women living in the north, 144 (32%) in the middle, and 150 (34%) in the south of the West Bank. 229 (52%) of respondents lived in urban areas, 209 (47%) in rural areas, and six (1%) in camps. 418 (94%) were or had been married. Regarding socioeconomic status, 130 (29%) were poor, 196 (44.1%) had middle incomes, and 118 (27%) had higher incomes. 208 (46.8%) women reported that they performed breast self-examination. 39 (8.8%) of respondents were aged 30–39 years (three refused to provide their ages), 205 (46%) 40–49 years, 142 (32%) aged 50–59 years, and 55 (12%) aged 60 years or older. 233 (53%) of women had completed fewer than 12 years of education. Respondents' knowledge about risk factors for breast cancer was poor, with 409 (92%) scoring ten or less in the questionnaire. Knowledge of clinical presentation was better, with only 126 (28%) showing poor knowledge. Among correct answers for risk factors, the highest percentages were found for breastfeeding as a protective factor (366 [82%]) and cigarette smoking as a risk factor (347 [78%]), whereas the lowest percentages were seen for oral contraceptive use (53 [12%]) and excessive antibiotic use (73 [16%]) as risk factors. We found a significant association between knowledge of risk factors and age ( $p=0.042$ ). Only 9% ( $n=35$ ) of the 408 women who were classified as having poor knowledge were aged 30–39 years, compared with 48% ( $n=196$ ) aged 40–49 years, 31% ( $n=124$ ) aged 50–59, and 123% ( $n=51$ ) aged 60 years or older. Among women with poor knowledge of clinical presentation, a significant association was found with less than 12 years of education ( $p=0.007$ ) and with not practising breast self-examination ( $p=0.006$ ).

**Interpretation** The level of education among the Palestinian women regarding breast cancer is inadequate. Further studies are needed to assess the effectiveness of breast self-examination and mammography screening, barriers to uptake of screening, and ways to increase knowledge in the community.

**Funding** None.

### Contributors

All authors designed the study and collected the data. NA did the statistical analysis. HS wrote and edited the Abstract. All authors reviewed and approved the final Abstract.

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# Barriers and challenges to multiple-casualty management systems: a single-centre, cross-sectional study at the Nasser Medical Complex, Gaza Strip

Tamer Abdalghafoor, Mohammed Alkhatib, Maha Al-Faqawi, Aiman Alastal, Bettina Bottcher

## Abstract

**Background** During a multiple-casualty incident, a large casualty caseload adversely affects the quality of care given to patients. From a trauma care perspective, the goal of the hospital emergency department plan is to simultaneously provide severely injured patients with a standard of care that approximates the care given to similar patients under normal conditions. This study highlights the barriers and challenges associated with implementing the emergency plans at the Nasser Medical Complex, Gaza Strip, occupied Palestinian territory, during a multiple-casualty incident, with the aim of facilitating appropriate staff training to address any deficiencies identified.

**Methods** A self-administered 70-item questionnaire reflecting the local major incident protocol (the Multiple Casualty Management System) was designed by the authors for completion by health-care staff. The questionnaire was divided into eight sections to assess knowledge and awareness and to specify deficiencies. Answers were analysed as frequencies and percentage points in terms of guideline adherence. Descriptive analysis were done on SPSS version 23.

**Findings** 70 questionnaires were completed by trauma team members (25 emergency doctors, 25 nurses, 15 surgeons, and five intensive care clinicians). The concepts of mass casualty and triage according to risk were understood by 40 (57%) of 70 participants, with most (65 ;93%) believing that the task of triage was to provide maximum care for the largest number of potential survivors. Only 50 (71%) reported competency in basic emergency skills like direct-current shock, chest tube insertion, cardiopulmonary resuscitation, nasogastric tube, and intravenous catheter insertion. Although 49 (70%) participants found the triage system very important, only 40 (57%) were able to apply it correctly. The biggest challenge was public acceptance of the concept of triage; only 5 (7%) participants believed that patients and relatives would accept a less urgent category. Furthermore, only 11 (16%) participants found that resources and equipment were adequate in case of mass casualty. Communication within the team was another struggle, with 45 participants were considering it unsatisfactory. However, 13 (19%) participants believed that the post-accident strategies with assessment plan to detect positive and negative points and clinical finding after the incident were satisfactory. Participants found the most important obstacles to efficient implementation of the emergency plan to be overcrowding in emergency department (63 [90%]), poor knowledge of the public regarding the importance of hospital triaging (59 [84%]), shortage of medical staff (57 [81%]), scarcity of resources (52 [74%]), ineffective security (52 [74%]), and insufficient staff training (41 [59%]). We also noticed that nearly all the emergency doctors were general practitioners without any specialised training. An emergency residency programme was started after the conclusion of this study, but results on the effects on multiple-casualty incident management are not yet available.

**Interpretation** This small study identified areas of weakness in the Multiple Casualty Management System, some due to poor resources and others to poor communication within the team or with the public. One important factor identified was the unawareness of the public of the importance of effective triage in this situation. Therefore, these areas should be addressed by staff feedback and training and by public awareness campaigns on the avoidance of overcrowding, the importance of non-threatening behaviour, and the purpose of triage in emergency department. Such interventions might also lead to improvement in day-to-day work at the emergency department, even outside the context of mass incidents.

**Funding** None.

## Contributors

TA and MA designed the study and collected the data. MA-F collected and analysed data. TA wrote the abstract. BB and MA reviewed the abstract. AA supervised the study and abstract revisions.

## Declaration of interests

We declare no competing interests.

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# Clinical and laboratory predictors in patients with acute meningitis in the Gaza Strip: a case series

Mohammed Alkhatib, Maha Al-Faqawi, Tamer Abd-Alghafoor, Alaa Eldeen Elmassry, Khamis Elessi, Reem Mustafa

## Abstract

**Background** Meningitis is an infection of the membranes (meninges) surrounding the brain and spinal cord. It is a dangerous condition with potentially serious consequences if misdiagnosed or left untreated. Our study aimed to summarise the clinical and laboratory predictors in patients with acute meningitis at one hospital in the Gaza Strip.

**Methods** We did a retrospective case series study of a series of randomly selected patients with meningitis who were admitted to Nasser Hospital (Gaza Strip, occupied Palestinian territory), with a target of 100 participants assessed using the ICD-10 code for meningitis. We extracted the relevant data using a pre-piloted and standardised data collection form and collected data on demographics and clinical and laboratory variables from patient medical records. Approval was obtained from the Palestinian Ministry of Health.

**Findings** We included 100 randomly selected records of patients who had been admitted to Nasser Hospital during 2016–18. 67 were male and 33 were female. Young (<20 years) patients were the most common age group affected (48 patients), followed by those aged 20–29 years (36 patients) whereas the least commonly affected were adults aged 40–49 years (three patients). There were 39 meningitis cases in the spring, 34 in the summer, 11 in the autumn, and 16 in winter. 76 patients presented with a fever of 38–40 degrees C° and 18 patients were afebrile. The most common presentation was headache and vomiting (39 patients) followed by vomiting and neck rigidity (34 patients). 34 patients had a positive Kernig's sign, 26 had a positive Brudzinski's sign, and only one participant was admitted with petechiae. We did not identify any data on testing for papilledema. We also examined cerebrospinal fluid analysis findings. The white blood cell count was less than 4000 per  $\mu\text{L}$  in 93 patients and 4000–10000 per  $\mu\text{L}$  in five patients. Only two patients had more than 10000 per  $\mu\text{L}$  white blood cells. The neutrophil count was less than 1500 per  $\mu\text{L}$  in 87 patients, 1500–7500 per  $\mu\text{L}$  in 11 patients, and only two patients had a neutrophil count of more than 7500 per  $\mu\text{L}$ . The platelet count was less than 150000 per  $\mu\text{L}$  in nine patients, whereas 84 patients had platelet counts between 150000 and 450000 per  $\mu\text{L}$ . The Gram stain was positive in 45 patients, negative in 50 patients, and not documented in five patients. The cerebrospinal fluid culture was positive for two patients, negative for 93 patients, and not documented for five patients.

**Interpretation** Our study showed that most acute meningitis cases occurred during the summer and spring. Any patient presenting with fever during these seasons should be suspected of meningitis. The Gram stain was informative in approximately half of patients and could guide decision making and antibiotic choice. However, classic meningeal signs (Kernig's and Brudzinski's signs) were absent in more than 50% of patients with acute meningitis. Therefore, the absence of these signs in adult patients cannot rule out meningitis. Notably, more than 93 patients with acute meningitis had a total white blood cell count in the cerebrospinal fluid of less than 4000 per  $\mu\text{L}$ . So, patients presenting with febrile illness ought to be suspected of meningitis in the light of a lower white blood cell count in the cerebrospinal fluid, which was more common in our case series. A limitation of this study is that using ICD-codes for ascertainment might miss some cases.

**Funding** None.

### Contributors

MA-F, AEE, MA, and TA-A designed the study. MA-F, MA, and TA-A collected the data. MA-F did the data analysis. MA-F and MA wrote the abstract. KE and RM reviewed and approved the final version of the abstract.

### Declaration of interests

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# Compliance amongst recipients of warfarin to treat non-valvular atrial fibrillation: a cross-sectional study

Hashem Mansour, Rafat Lubbad, Hasan Aboobaid, Khamis Issi

## Abstract

**Background** Vitamin K antagonists, such as warfarin, are the most prescribed anticoagulation medication for the treatment of non-valvular atrial fibrillation (NVAF). The prevalence of NVAF ranges from 0·5% to 1·0% in the general population. We investigated compliance with warfarin treatment among patients with NVAF in Gaza Strip.

**Methods** This was a cross-sectional study done from January, 2017, to October, 2017, at the Indonesian Hospital, Gaza Strip, occupied Palestinian territory. Eligible patients were those admitted to the medical department who were taking warfarin for NVAF, with or without comorbidities, and aged 20–85 years. Patients taking warfarin for other diseases (eg, antiphospholipid syndrome) were excluded. We developed a questionnaire to assesses patients' knowledge about warfarin therapy. The questionnaire was administered by one clinical pharmacist [HM] in face-to-face interviews to avoid difficulties arising from illiteracy, visual impairment, and technical questions. Laboratory data (international normalised ratio [INR], serum creatinine, random blood sugar, systolic and diastolic blood pressure, and liver chemistry) were obtained from clinical records. Continuous data are presented as the mean (SD) and the categorical variables as numbers and percentages. We used binary univariate analysis to assess relationships between quantitative variables. Significant results had two-tailed p values less than 0·05. All data were analysed using SPSS version 20. The study was approved by the Ministry of Health and Helsinki Committee of Gaza Strip. All patients provided written informed consent.

**Findings** 100 patients were enrolled in the study (53% men, 47% women), with a mean age of 55 (SD 7) years. 43% of patients had hypertension, 15% had diabetes, and 42% were smokers. 43% of the patients knew of the risks of warfarin treatment whereas 39% understood the benefits. Only 38% of patients were within the therapeutic INR range of 2–3 and 35% had INR values higher than this range. 66% of patients did not have INR monitored regularly and 28% had no regular contact with health-care providers for INR follow up. 21% of patients did not take their daily dose and 36% had developed haemorrhages; only 4% knew how to deal with this complication. Of those who developed haemorrhages, the most common manifestations were epistaxis (44%) and gastrointestinal bleeding (36%). There were no instances of CNS haemorrhage. We found significant relationships between creatinine concentration, diastolic blood pressure, systolic blood pressure, and INR (all  $p < 0\cdot05$ )

**Interpretation** The findings of this study show that most of patients were unaware of the risks and benefits of warfarin therapy. We recommend that an anticoagulation clinic is established to provide INR monitoring and education qualified health-care providers. A limitation of this study was low number of patients, but no funding was available for follow-up. However, the accuracy of data give strength to the results, which are representative of the real-world experience of patients with NVAF in our region.

**Funding** None.

### Contributors

HM, RL, and HA conceptualised the study. HM and HA designed the study. HM and RL contributed to the study procedures. HM collected the data. HM and KI input, analysed, and managed the data and wrote and revised the Abstract. All authors approved the final version of the Abstract for publication.

### Declaration of interests

We declare no competing interests.

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# Compliance of dental health care providers with the infection prevention and control protocol in Gaza Strip: a cross-sectional study

Amjad El-Rayyes, Lamis Abuhaloob

## Abstract

**Background** The Palestinian Ministry of Health (MOH) developed the infection prevention and control (IPC) protocol in 2004 to control infection among dental health care providers in their interactions with clients, the community, and the environment. Adherence to the protocol has not previously been reported. We compared compliance of dental health-care providers with the IPC protocol and in MOH and United Nations Relief and Work Agency for Palestine Refugees (UNRWA) clinics and assessed factors affecting adherence.

**Methods** We did a cross-sectional observational study in all Gaza Strip governorates. A self-administered questionnaire was sent to 137 dental health-care providers in the region to collect data about compliance with the IPC protocol. In parallel, we completed two observational checklists for each dental health-care provider during visits to clinics: one assessing compliance (completed three times with 3-day intervals) and one assessing the presence and availability of IPC systems and supplies (completed once). Data were analysed by  $\chi^2$  and  $t$  test, with  $p < 0.05$  indicating significance. Ethics approval was obtained from the Palestinian Helsinki Committee, and dental health-care providers gave written informed consent for inclusion in the study.

**Findings** 137 (100%) dental health-care providers completed questionnaires. 82 (60%) respondents were men and 55 (40%) were women. 90 (66%) worked in MOH clinics (67 dentists and 30 practical nurses) and 40 (34%) in UNRWA clinics (24 dentists, 14 practical nurses, one dental nurse, and one oral hygienist). 134 (98%) of 137 dental health-care providers had received a hepatitis B vaccination. 97 (80%) dental health-care providers in MOH clinics and 38 (95%) of those in UNRWA clinics showed compliance in applying the IPC protocol during practice ( $p < 0.001$ ). Only 40 (29%) of respondents in MOH clinics and only four (3%) in UNRWA clinics had a hard copy of the IPC protocol. 29 (21%) of 137 respondents had systems for monitoring infection rates in their clinics. 65 (47%) attributed the shortage of IPC materials in clinics, such as bleaching agents, suction tubes, face shield or masks, and aprons, to lack of availability in central medical stores. 104 (76%) of respondents showed good knowledge of the importance of IPC standards for society, 115 (84%) had suggestions for modification of the protocol, and 137 (100%) reported that there was no protocol for prevention of medical injuries (eg, needlestick injury) as only a post-exposure programme was included in the IPC protocol. Adherence of dental health care providers to the IPC protocol was significantly higher in UNRWA clinics than in MOH clinics ( $p < 0.001$ ).

**Interpretation** There is an urgent need to develop the IPC protocol for dentistry. Future interventions and training, securing essential IPC materials, and increased monitoring of IPC coverage in MOH and UNRWA clinics will be needed to achieve this goal.

**Funding** None.

### Contributors

AE did the statistical analysis and wrote the Abstract. LA supervised the research and reviewed the Abstract. Both authors have seen and approved the final version of the abstract for publication.

### Declaration of interests

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# Does preconception care make a difference to pregnancy outcomes? A quasi-experimental, mixed-methods study

Maha Timraz, Bassam Abu-Hamad, Ali Ibaïd

## Abstract

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**Background** Preconception care comprises a set of prevention and management interventions that aim to identify and modify risks to a woman's health or pregnancy outcome by emphasising factors that must be acted on before or early in pregnancy. This study aimed to ascertain the effect of the preconception care programme offered at UN Relief and Works Agency primary health-care centres in Gaza, Relief and Works Agency, on pregnancy outcomes.

**Methods** A quasi-experimental, mixed-methods study was done between Aug 16, 2018, and April 30, 2019. A stratified sampling process resulted in the selection of five of 22 UN Relief and Works Agency primary health-care clinics in Gaza, from which a sample of women was selected by the convenience method. A purposive sample of 11 key informants were interviewed. 60 beneficiaries and non-beneficiaries of preconception care also participated in focus group discussions. A structured interview questionnaire and records review were used for the quantitative study, and a semi-structured protocol was used for the qualitative study. Quantitative data were analysed with SPSS version 21.0 and an open coding thematic technique was used to analyse the qualitative data. The protocol of this study was approved by the Gaza Field Office and headquarters of the UN Relief and Works Agency and by the Al Quds University and was given ethical permission by the Palestinian Helsinki committee. All participants provided written informed consent.

**Findings** 800 women (400 who received preconception care and 400 controls) were included in the analysis. 188 (47%) of recipients first learned about the service through midwives. 176 (44%) of recipients registered for the service because they were planning to get pregnant. Regarding preconception care activities, 288 (72%) of recipients indicated that they received health advice, 396 (99%) were screened for hypertension, diabetes, and dental and breast problems and given folic acid, and more than 328 (82%) of recipients were counselled about its importance. 368 (92%) of recipients of preconception care took folic acid before conception, compared with 60 (15%) of non-recipients. 232 (58%) of recipients of preconception care and 268 (67%) of non-recipients had complications during their latest pregnancy, including genitourinary tract infection and anaemia. The percentage of women who delivered via caesarean section was 100 (25%) of recipients and 72 (18%) of non-recipients. 92 (23%) of recipients of preconception care and 128 (32%) of non-recipients had complications during their last delivery, especially bleeding. 72 (64%) of recipients and 268 (67%) of non-recipients had a full-term pregnancy. The mean birthweight of babies was 3274·5 g among recipients and 3225·4 g among non-recipients ( $p=0·2$ ).

**Interpretation** Our study showed that providing preconception care promotes positive maternal outcomes, yet further enhancement is needed. Targeting recipients of service, improving staff communication, informing and counselling prospective mothers, and ensuring compliance with technical instructions are areas that require further attention, as is strengthening monitoring and supervision.

**Funding** None.

### Contributors

MT designed the study, collected and analysed the data with support from AAI with supervision from BA-H, and wrote the abstract with BA-H. MT and AAI contributed to data interpretation. BA-H provided overall supervision. All authors have seen and approved the final version of the abstract for publication.

### Declaration of interests

We declare no competing interests.

### Acknowledgments

We are grateful to all patients who participated in this study and to the UN Relief and Works Agency staff who devoted their time during the focus groups interviews.

# Effect of early breast feeding on pain perception in women undergoing spinal anaesthesia for caesarean delivery: a comparative study

Noor El Najar, Samar El Hams, Khaled Abu El Aish

## Abstract

**Background** Postoperative pain reduction is a key priority after caesarean delivery. Current recommendations are to breastfeed the baby as soon as possible after birth, including after caesarean section. However, analgesics can transfer into breast milk, and hence an ideal scenario is a postoperative period free from analgesics and pain. The aim of this study was to determine the effect of early breastfeeding on pain perception after caesarean delivery with spinal anaesthesia in the Gaza Strip.

**Methods** Data for the comparative study were collected by research nurses at the Al Helal Al Emirati Hospital, Rafah, Gaza Strip, occupied Palestinian territory, from May to October, 2019. All women who had delivered at the hospital were encouraged to breastfeed as early as possible after caesarean delivery. Women who underwent caesarean delivery with spinal anaesthesia were assigned to one of two groups. Group 1 were women who breastfed in the first hour after caesarean delivery. Group 2 were women who were unable to breastfeed early (within 24 h) owing to maternal morbidity or neonatal causes such as admission to the neonatal intensive care units or a stillborn baby. A pain assessment scale (PAS; range 1–5, in which 1=no pain and 5=worst pain imaginable) was used to record the pain 1 h after the end of the caesarean delivery and then at 6 h, 12 h, 18 h, and 24 h. The time from the end of the caesarean delivery to the first demand for other analgesia and the total amounts and types of analgesics used in 24 h were recorded. The study was approved by the Palestinian Ministry of Health and the Helsinki Committee, Gaza Strip. Women provided verbal informed consent before participation.

**Findings** In the period of the study there were approximately 590 women who delivered by caesarean section at Al Helal Al Emirati hospital, of whom 149 received spinal anaesthesia. Data from these 149 patients (mean age 30·85 years [SD 6·29]) were investigated: 111 (75%) in group 1 and 38 (26%) in group 2. The reported pain was lower in the first and 12th hour in group 1 than in group 2 (first hour, PAS 1·35 for group 1 vs 1·87 for group 2,  $p=0\cdot004$ ; 12th hour, PAS 1·35 for group 1 vs 1·73 for group 2,  $p=0\cdot015$ ). In group 1, 40 (36%) of 111 women needed analgesics after caesarean delivery, compared with 22 (58%) of 38 women in group 2 ( $p=0\cdot018$ ). Of the women who needed additional analgesia, 33 (83%) of 40 took only one analgesic and five (13%) of 40 took two analgesics in group 1, compared with 15 (68%) of 22 who took one analgesic and six (27%) of 22 who took two analgesics in group 2 ( $p=0\cdot345$  for group 1 vs group 2). The mean time to needing other analgesic drugs was longer in group 1 than in group 2 (10·54 h [SD 1·25] vs 6·40 h [SD 1·43];  $p=0\cdot035$ ).

**Interpretation** Breastfeeding within 1 h after caesarean delivery with spinal anaesthesia was associated with better pain reduction than no breastfeeding within 24 h. A multicentre study over a longer period post delivery, with a larger study population to include more types of delivery, would be of great benefit.

**Funding** None.

## Contributors

NEN and SEH contributed to data collection. KAEA contributed to data collection, cleaning, sorting, and coding, and to writing 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 chemotherapy-induced peripheral neuropathy on daily living: a cross-sectional survey

Rana Amro, Teny Arakelian, Aya Abd Al-Nabi, Sajida Fakhuri, Manar Jaber

## Abstract

**Background** Chemotherapy has several side-effects, including chemotherapy-induced peripheral neuropathy (CIPN), that can substantially reduce patients' activities of and participation in daily living. Few studies have addressed this issue. We investigated the effects that CIPN has on daily living of patients in occupied Palestinian territory.

**Methods** We did a quantitative observational cross-sectional survey of patients at the Augusta Victoria Hospital, East Jerusalem, which provides chemotherapy, and the Dunya Women's Cancer Centre, Ramallah, which provides services for women during and after chemotherapy. Eligible patients were aged 18–65 years, had received six or more cycles of chemotherapy, did not have end-stage cancer, could read and understand Arabic, and had no other illnesses that affected the nervous system or mobility. The CIPN Rasch-built overall disability scale was translated into Arabic and two questions were added. The first was to determine CIPN-associated symptoms and the second was to add the activity of cleaning with water. The questionnaire was distributed to patients via the study sites. SPSS version 22.0 was used to analyse the data with multiple tests, such as one-way ANOVA, *t* test,  $\chi^2$ , and the Tukey test. The threshold for significance was  $\alpha=0\cdot05$ .

**Findings** Of 37 eligible patients, 32 were included (10 men and 22 women) with any type of cancer. CIPN had significantly negative effects on activities and participation in daily living ( $\alpha=0\cdot008$ ). Women were affected more than men ( $\alpha=0\cdot001$ ) but there was no correlation between effects on daily living and age ( $\alpha=0\cdot773$ ), place of living ( $\alpha=0\cdot092$ ), or chemotherapy ( $\alpha=0\cdot894$ ). The most reported symptom of CIPN was pain ( $n=23$  [72%]) and the least reported symptom was loss of hearing ( $n=10$  [31%]). The most affected activity was walking uphill (mean score  $1\cdot3438$  [SD  $0\cdot82733$ ]) and the least affected activity was moving a chair ( $2\cdot8438$  [ $0\cdot3689$ ]).

**Interpretation** We found that chemotherapy has notable consequences for activities of daily living. This study had several limitations: small sample size, limited number of centres that provide cancer treatments. These were due to the geographical locations of such centres and checkpoints sometimes preventing access. Additionally, the statistical data about cancer patients were limited because not all centres record chemotherapy cycle numbers, and specific cancer diagnoses and, therefore, we could not include more study sites. CIPN is, therefore, probably under-reported.

**Funding** None.

## Contributors

All authors conceived the study. MJ supervised the study. TA, AA-A, and SF collected the data and RA analysis and interpreted them. RA and TA drafted the Abstract, which was reviewed and approved by MJ. All author approved the final version of the abstract for publication.

## Declaration of interests

We declare no competing interests.

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# Ethical, legal, and sociocultural challenges of genomic research in Jordan: a mixed methods study in patients with breast cancer with Jordanian–Palestinian heritage

Amal Al-Omari, Maysa Al-Hussaini, Farah Zahran, Hikmat Abdel-Razeq

## Abstract

**Background** Breast cancer is a leading cause of morbidity and mortality in women worldwide. At King Hussein Cancer Center (KHCC), Amman, Jordan, 38% of breast cancer diagnoses are in women younger than 45 years, which might reflect a high prevalence of hereditary breast cancer. The aim of this study was to assess the contribution of germline mutations in *BRCA1* and *BRCA2* to breast cancer treated at KHCC. We also describe our experience in dealing with this delicate cultural issue in a tribal-based country with Palestinian–Jordanian family origins.

**Methods** Patients treated at KHCC with stage I–IV breast cancer, with a high-risk profile according to US National Comprehensive Cancer Network guidelines, were invited to participate. Patients were interviewed for consent and had full autonomy to decide whether they wanted to know their test result, inform their treating physician, or have a copy of the result placed in their charts. Charts were reviewed for clinical data and tumour pathology. A 10 mL blood sample was obtained for DNA extraction. A detailed three-generation family history was obtained. *BRCA* sequencing was done at the Myriad Genetics laboratory using BRCAAnalysis. *BRCA* mutations were classified as deleterious, suspected deleterious, variant of uncertain significance (VUS), or favour polymorphism (harmless). The report received for each mutation result contained a detailed description of level of risk associated with the involved variant and estimated lifetime risk of breast and ovarian cancer, risk of second breast cancer or subsequent ovarian cancer, and risk of cancer to first, second, and third-degree family members. Patients were invited to an ad-hoc clinic with the treating physician for disclosure of results and counselling about estimated cancer risk to patient and relatives. Interviews with patients were summarised as text and qualitative analysis for common themes was done. Challenges encountered during patient consent and disclosure of results were documented, as well as proposed solutions. Ethical approval was granted by the KHCC Institutional Review Board (no 11 KHCC 63).

**Findings** The first 102 patients to meet inclusion criteria were invited to participate in the study, of whom 100 enrolled and provided written informed consent. Two patients declined to participate (a response rate of 98%). Six participants were residents of the West Bank and treated at KHCC, and 66 were from families of Palestinian origin residing in Jordan. The remaining patients were Jordanians. Median age was 40 years (range 22–75). 20 patients had deleterious mutations and seven had suspected deleterious mutations in *BRCA1* and *BRCA2* genes. Seven VUS were detected. All patients with *BRCA1* and *BRCA2* mutations had a significant family history of breast or ovarian cancer. Nevertheless, many patients with a significant family history (62 of 100) tested negative for *BRCA1* and *BRCA2* mutations. Many ethical dilemmas were highlighted during patient encounters, mainly relating to the guarantee of confidentiality and privacy in a tribal-based culture, fears of false reassurance, autonomy versus beneficence, and the bounds of physician–patient confidentiality when relatives are at genetic risk of cancer. Potential insurance, employment, and social discrimination implications were also addressed with the patients before testing and in more detail after disclosure of positive mutation results, which flagged a legal void in local genetic testing and data protection regulations.

**Interpretation** Our cohort showed an important incidence of deleterious and suspected deleterious *BRCA1* and *BRCA2* mutations, suggesting that genetic testing should be discussed and offered to patients with high-risk features. Many high-risk patients tested negative for *BRCA1* and *BRCA2* mutations, therefore future studies should aim to test for mutations in other breast cancer susceptibility genes (eg, *CHEK2*, *PALB2*, and *BRIPI1*). Running culturally sensitive genetic research in a country with limited resources is a challenging exercise and highlights the urgent need for guiding regulations. We recommend establishing a clinical cancer genetics programme, through which unaffected family members would benefit from early breast cancer screening and appropriate risk-reduction measures.

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### Contributors

AA and HA conceived the study. AA, HA, and FZ recruited patients and collected data. MA provided input on the study concept. AA wrote Abstract with input from all authors. All authors have seen and approved the final version of the Abstract for publication

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# Evaluating the amount of knowledge about palliative care concepts among health professionals and medical students in the Gaza Strip: a cross-sectional study

Abdallah Alwali, Ahmad Alborno, Amal Shaikhah, Esraa AbuHamed, Shrooq Abulqumboz, Ayah AbuQamar, Abedelrahman Diab, Bettina Bottcher

## Abstract

**Background** Improvements in diagnostic facilities and health-care services result in increased numbers of patients with end-stage disease being diagnosed and improvements in medical care for these patients resulting in longer life expectancy. This result generates the need to develop an integrative care system covering patient's physical, psychological, social, and spiritual needs. In the Gaza Strip, the scarcity of palliative care professionals reveals the necessity to develop such care systems. This study evaluated the knowledge of physicians, nurses, and medical students in the Gaza Strip hospitals about palliative care concepts.

**Methods** A cross-sectional study was conducted in five hospitals in the Gaza Strip, occupied Palestinian territory. Eligible to participate were all physicians, nurses, and medical students who were willing to participate. In total, 352 participants completed the self-administered, validated Palliative Care Knowledge Test. The primary outcome was participant's amount of knowledge on palliative care concepts (including 20 questions on five subscales). The sample size was chosen on the basis of the Epi-Info tool (with a confidence level of 0.95). Results were analysed using SPSS version 23, a one-way ANOVA, and post-hoc tests. Ethical approval was obtained from the Palestinian Health Research Council Helsinki Committee and consent was obtained from the participants.

**Findings** Patients were recruited from Sept 1 to Dec 31, 2019. The mean age of the 352 participants was 31.9 years (SD 9.5). 210 (59.7%) participants were male, 142 (40.3%) were female, 97 (27.6%) were physicians, 162 (46.0%) were nurses, and 93 (26.4%) were students. The overall average total correct score (of which 100% indicated all questions were answered correctly and reflected the maximum level of knowledge) of the subscales was 47.0%. The average scores across all participants were: 68.9% for philosophy, 41.3% for pain, 37.2% for dyspnoea, 48.5% for psychiatric problems, and 39.2% for gastrointestinal problems. Men scored higher than women, but the difference was not significant ( $p>0.05$ ). There was a statistically significant difference between physicians, nurses, and students in two subscales (philosophy and dyspnoea) as established by a one-way ANOVA ( $F=7.17$ ,  $p=0.001$  for philosophy;  $F=4.67$ ,  $p=0.010$  for dyspnoea). A Bonferroni post-hoc test revealed that physicians' knowledge in philosophy was significantly higher than that of nurses, with a mean difference in questionnaire scores of 25.2%; but notably, the students' knowledge was significantly higher than that of nurses, with a mean difference of 32.6%. Additionally, physicians' knowledge in dyspnoea was significantly higher than nurses' by a mean difference of 0.386 and higher than students' by a mean difference of 22.7%. Other subscales did not show any significant differences. Significant differences were found in the subscale scores between different hospitals, except for gastrointestinal problems.

**Interpretation** The overall low Palliative Care Knowledge Test scores indicate large knowledge gaps. Although philosophy and psychiatric problems were better understood than other concepts, the results were still substantially less than the ideal percentage of 100%. Poor knowledge is likely to reflect poor practice and care for patients with end-stage disease. Students undergo intensive palliative care training at one university, as reflected in their significantly better scores for some subscales, suggesting the effectiveness of educational measures. Palliative care integration is a joint responsibility of professionals and decision makers and should be strengthened by building palliative care teams as well as staff education across all hospitals.

**Funding** None.

## Contributors

AAW designed the study, analysed and contributed to the interpretation of the data, and drafted the manuscript. AAlw, AAlb, AS, EA, SA, AAbu, AD, and BB contributed to data collection, data entry, and data analysis. BB contributed to the design of the study, interpretation of results, and revision of the manuscript.

## Declaration of interests

We declare no competing interests.

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# Fieldwork opportunities and challenges in Palestinian refugee camps in the West Bank, occupied Palestinian territory, and in Jordan: lessons learned from a Palestinian adolescent reproductive health cross-sectional study

Rula Ghandour, Dima Massoud, Reem Ladadwa, Weeam Hammoudeh, Gerd Holmboe Ottesen, Heidi Fjeld, Abdullatif Husseini, Rita Giacaman

## Abstract

**Background** Palestinian refugee camps have lasted for more than 70 years. Generally the residents are poor and the camps are crowded and politically unstable, with a range of social, cultural, and economic constraints. Studying the adolescent reproductive health of girls in refugee camps is crucial yet challenging, primarily because of its sensitive nature. We use experiences from a cross-sectional study of Palestinian adolescent reproductive health to discuss methodological challenges and opportunities for researching this subject in the context of refugee camps.

**Methods** We completed a household survey in Palestinian refugee camps in the West Bank (19 camps) and Jordan (ten camps) from June to September, 2019. Data from 2949 adolescent girls aged 15–18 years (1443 from the West Bank and 1506 from Jordan) were collected in relation to menarche and menstruation, mental health, and nutrition. A fingerprick haemoglobin test for anaemia was conducted among participating girls. Data were collected by women fieldworkers using electronic tablets. Written consent was obtained from girls and their mothers or a female caregiver for both the survey and the blood tests. Consent to enter the household was obtained first, then consent from girls.

**Findings** Response rates at the household level were 3573 (87%) of 4103 and 3210 (74%) of 4314 for the West Bank and Jordan, respectively, and for girls were 1443 (95%) of 1522 and 1506 (99%) of 1526 for the West Bank and Jordan, respectively. This seemed to suggest a higher level of trust and willingness to participate in the West Bank compared with Jordan at the household level, although this seemed almost no problem for the girls as long as their caregivers had agreed. During data collection, we encountered fieldwork challenges at political, social, cultural, and structural levels. When recruiting participants, fieldworkers used a random-walk procedure, as it was hard for them to track their route in the narrow, unstructured, and unidentified camp roads and alleyways, which caused delays and disruption to the process. Crowded households posed an ethical challenge in securing girls' privacy, particularly in more conservative Jordan. Furthermore, we encountered resistance to fingerprick blood tests owing to fear of contamination, particularly in the more politically unstable camps in the West Bank. The political situation also affected fieldwork in the West Bank by limiting working hours owing to road closures and Israeli army incursions. Despite this, fieldworkers were able to develop a good rapport with participants, especially when the fieldworkers themselves were camp dwellers. Engagement and involvement with local organisations was essential for research teams to gain the trust of families and girls, enabling valuable and credible data collection.

**Interpretation** When conducting studies in Palestinian refugee camps, especially on sensitive issues, it is crucial to know the camp well, obtain assistance from local organisations to acquaint and familiarise the population with the research, and to use trained fieldworkers from the local community. Finally, and most importantly, it is essential to be flexible and to have contingency plans that include extra time, personnel, and resources that may be needed to overcome unforeseen circumstances.

**Funding** International Development Research Centre (IDRC), Ottawa, Canada.

### Contributors

RG, DM, RL, WH, GHO, HF, AH, and RG contributed to conception of the study and writing 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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# First complex maxillofacial reconstruction with free flaps in the Gaza Strip, occupied Palestinian territory: case series from an area under conflict

Wafaa AlZaanin, Anas Ismail, Hala Shoman, Rami AlJuaidi, Aghyad AlMobaid, Tariq Kuhail, Laurent Ganry, Quentin Qassemyar

## Abstract

**Background** Large mandibular and maxillary defects are repaired by maxillofacial reconstructive microsurgery (MRM) using free flaps, which is challenging to perform in austere settings owing to its demanding nature in terms of time, equipment, and trained personnel. Humanitarian missions refrain from performing MRM procedures in the host country and instead transfer patients to their home country to perform surgery. We report on the first nine MRM procedures in Gaza.

**Methods** A French medical mission performed the surgical operations at Al Shifa Hospital, Gaza, occupied Palestinian territory. Fibula free flap, radial forearm free flap, scapular free flap, and thoracodorsal perforator free flap were performed. We recorded the patients' demographics, diagnoses, and immediate postoperative and follow-up status. We also report the special considerations required to perform the surgery in Gaza's austere and resource-poor environment.

**Findings** Nine patients (five female, four male; mean age 22 years) underwent ablative head and neck surgery from January, 2017, to March, 2019. Before arrival, the missions closely coordinated with local surgeons, who assisted in performing the surgeries and followed the patients postoperatively. Essential surgical equipment needed for the surgery (such as loupes, microvascular sutures, and titanium plates) were donated by the foreign missions. Patients were followed up by local surgeons for a period ranging from 5 to 12 months. No complications occurred at the donor or recipient sites. There was no extrusion of hardware or breakage of the titanium mini plates or reconstructive plates. Patients remained in the intensive care unit postoperatively for at least 48 h. Owing to financial restraints, removable prostheses were used. Rehabilitation was provided by a local dental team despite the lack of professional dental rehabilitation services. Patients had stable bony union and acceptable facial contour. Patients regained satisfactory masticatory function, resumed their normal diets after 6 months without weight loss, and maintained intelligible speech.

**Interpretation** MRM can be successfully performed in conflict settings such as Gaza. Although the study population was small, the study suggests that further investigation into the conditions and elements needed to perform complex surgeries in conflict settings is warranted. Selection of health-care professionals in the surgical and postoperative care teams, effective coordination with local doctors, availability of essential equipment, and postoperative follow-up protocols could all be carefully considered to optimise the results of surgery. In addition, starting rehabilitation as soon as possible following surgery may restore and improve functional and aesthetic outcomes.

**Funding** The Palestine Children's Relief Fund (PCRF).

### Contributors

WA, AI, and HS took part in screening patients, collecting data peri-operatively, and analysing the data. WA wrote the Abstract with input from AI, LG, and QQ. WA, RAJ, AAM, and TK assisted the foreign surgeons in surgery and followed up patients postoperatively. QQ was the lead surgeon in all surgeries. 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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# Health of female agricultural workers in the Jordan Valley: an exploration of the effects of broader environmental transformations

Maysaa Nemer, Ahmed Heneiti, Suzan Mitwalli, Dina Zidan

## Abstract

**Background** The Jordan Valley, one of the main agricultural areas of the West Bank, has been subject to several structural challenges owing to political, economic, and ecological factors. Palestinians in the Jordan Valley live in poverty, in constant fear of home demolitions, and with constraints on their ability to maintain agricultural livelihoods. Several reports have described living conditions in the Jordan Valley, but none have focused on the situation of female agricultural workers. This study aimed to investigate the changes in agriculture in the Jordan Valley, and how these changes have affected the ways in which female agricultural workers carry out their work, and the effects on their living conditions and health.

**Methods** Qualitative interviews with 30 women (aged  $\geq 18$  years) and two focus groups, each containing ten women, were carried out between June and December, 2019. The participants were agricultural workers in two communities in the Jordan Valley—Nweimeh-Dyouk and Jiflik—that were selected as examples of different scenarios resulting from the classification of land after the Oslo Accords. Participants were selected using purposive and snowball sampling. Interviews and focus groups were recorded and transcribed verbatim. Transcripts were analysed thematically through repeated reading and re-reading until patterns and themes gradually appeared. Ethical approval was obtained from the Research Ethics Committee of the Institute of Community and Public Health. Informed verbal consent was obtained from all participants.

**Findings** The role of female individuals in agriculture has changed with the introduction of agricultural technology. Although technology has decreased the effort required to prepare land, which is mainly done by male individuals, the increased production has required greater efforts in harvesting crops and loading boxes, which are tasks mainly done by women. Although agricultural work is the main occupation of women in the Jordan Valley, there has been a decline in its economic benefits, because of land confiscation and restrictions on water resources by Israeli occupation. This decrease has led to female individuals pursuing different routes to earn an income. Some women continue to work in agriculture on family land, whereas others have started to work on Palestinian or Israeli farms outside the family. Some women migrate, with their family, to other locations to work in agriculture. Women in the first category have better living conditions and social interactions with their community but have difficult economic conditions. Those in the second category have better economic conditions, and those in the third category have very poor living, social, and economic conditions compared with those in the other categories. In terms of the health effects of their work, most women reported that carrying heavy loads and continuous bending when harvesting affected their bones, muscles, and joints. There were several cases of asthma, and respiratory and skin allergies. Additional problems related to dehydration and poor nutrition, resulting from increased workloads and difficult living conditions, were reported.

**Interpretation** Changes in the agricultural sector in the Jordan Valley have affected the way in which female agricultural workers carry out their work, as well as their living conditions and health status. Difficult living conditions, together with occupational exposure, and lack of awareness of safety measures and agronomic techniques and skills, have negatively affected the health status of female agricultural workers. Unless more attention is given to this group of female workers, they will continue to experience difficult living conditions, low levels of social interaction, lack of proper employment (without formal or stable salaries, contracts, or annual leave) and adverse effects on their health.

**Funding** Arab Council for the Social Sciences, Swedish International Development Cooperation Agency.

## Contributors

MN and AH designed the study and performed coding and analysis. MN, AH, SM, and DZ were involved in data collection and transcription and interpretation of results. MN drafted the Abstract with input from all authors. All authors saw and approved the final version for publication.

## Declaration of interests

We declare no competing interests.

## Acknowledgments

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# Health status of patients with $\beta$ -thalassemia in the West Bank: a retrospective study

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## Abstract

**Background** The management of  $\beta$ -thalassemia in developing countries is challenging due to few treatments being available other than recurrent transfusions. We assessed the haematological, biochemical, and hormonal findings among patients with  $\beta$ -thalassemia in the West Bank, occupied Palestinian territory.

**Methods** This retrospective study was done between Jan 1, 2017, and Dec 31, 2018. Data on haematological, biochemical, and hormonal tests were collected from medical files of patients with  $\beta$ -thalassemia in eight primary health-care clinics, nine emergency departments, and eleven Palestinian Ministry of Health hospitals across the West Bank. Additionally, we collected data on demographics and the use of iron chelation. The study was approved by the research ethics committee at Al-Quds University and the Palestinian Ministry of Health (reference 162/1075/2019). The data had no identifying information and, therefore, informed consent from patients was waived for this study.

**Findings** 309 patients with  $\beta$ -thalassemia were included in the study (154 men and 155 women), with an average age of 23.4 (SD 10.4) years. 202 (79%) patients had pretransfusion haemoglobin concentrations lower than 9 g/dL (mean 8.4 [SD 1.4]). Additionally, 185 (73%) had iron overload, with the mean ferritin concentration in serum being 3175.8  $\mu$ g/L (SD 3378.8). Concentrations of alanine aminotransferase and aspartate aminotransferase were high in 91 (38%) and 145 (61%) patients, respectively, and correlated positively with serum ferritin concentrations ( $r=0.527$  and  $r=0.254$ , respectively; both  $p<0.0001$ ). Kidney function tests (serum creatinine and blood urea nitrogen) did not correlate with serum ferritin ( $p=0.553$  and  $0.280$ , respectively). Deferoxamine was used for iron chelation in 63 (27%), and these patients had significantly higher ferritin concentrations in serum than patients receiving deferasirox (175 [74%],  $p=0.009$ ). A small proportion of patients had endocrine function data that indicated abnormal total tri-iodothyronine, free thyroxine, and thyroid-stimulating hormone levels in 24 (34%), 29 (37%), and 24 (15%) patients, respectively, in addition to abnormal parathyroid hormone levels in 25 (50%) patients. However, these findings were not sufficient to diagnose or interpret endocrinopathies.

**Interpretation** Our findings showed a lack of adherence to international guidelines in the management of  $\beta$ -thalassemia, which was reflected by the low pretransfusion haemoglobin and high serum ferritin concentrations. This study highlights the importance of establishing patient-tailored comprehensive assessment and follow-up protocols for the management of  $\beta$ -thalassemia with an emphasis on blood transfusion and iron chelation practices.

**Funding** None.

## Contributors

RAS conceived and designed the study. BK facilitated the process of data collection through the Palestinian Ministry of Health and contributed to confirming the cases selected in the study. RKD, TIAM, IIT, SSW, and SMA collected, entered, analysed, and interpreted the data. RKD drafted the Abstract. All authors approved the final version of the Abstract for publication.

## Declaration of interests

We declare no competing interests.

## Acknowledgments

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# Housing precariousness and health: a mixed-methods study into households affected by displacements and demolitions in East Jerusalem

Ben Bouquet\*, Manal Massalha\*, Juliana Nassar\*, Bashaer al-Natsheh\*, Rita Giacaman

## Abstract

**Background** East Jerusalem residency status for more than 350 000 Palestinians depends on showing that there is a continued centre of life in the city and can be revoked on the grounds of a breach of allegiance. 2975 Palestinians in East Jerusalem were displaced or had their homes demolished between 2009 and 2021, primarily on the grounds of not having Israeli-issued building permits, which are highly difficult to obtain, or settler takeover. We aimed to explore the perceived health effects of demolition or displacement, and to assess self-reported health and the intersection of housing precariousness and other forms of precarity in East Jerusalem.

**Methods** We did a mixed-methods study in East Jerusalem. Drawing on a database of demolition or displacement in East Jerusalem from 2009 to 2019, we undertook ten household case studies, using in-depth interviews, site visits, and visual ethnography, and surveyed a systematic random sample of 120 women, each representing a separate household that underwent demolition or displacement during 2017–19. In the qualitative component, we chose a mix of different types of demolition or displacement and post-displacement housing trajectories. We used survey tools to assess household demographics; exposure to different forms of precarity and occupation-related violence; a measure of human insecurity (Birzeit University human insecurity scale); and self-reported health (SF-12 version 2 assessment), wellbeing (WHO-Five Wellbeing Index), and disability (Washington Group short questions).

**Findings** We examined the perceived health effects of demolition or displacement related to experiences of the event; subsequent housing quality; subsequent neighbourhood and its environmental quality; the under-provision of municipal services; and psychosocial stress connected with affordability, tenure, and absence of security and legal protections. The survey response rate was 84 households (70%) of 120. 79 households (94%) of 84 underwent demolition, whereas five households (6%) were displaced without demolition. 19 households (24%) of 79 experienced two or more incidences of demolition and six households (7%) of 84 had at least one family member who had lost East Jerusalem residency. Economically, in 22 households (26%), the head of the household was unemployed, 45 households (54%) worried daily about debt, and 32 households (38%) met the criteria for overcrowding (three or more people per room). From 18 households (21%), women reported experiencing personal humiliation by occupation forces, whereas women from 33 households (39%) reported exposure to acts of humiliation of others, and women from 18 households (21%) reported the detention or arrest of other household members. Women from 39 households (46%) experienced high human insecurity; the mean SF-12 version 2 assessment score was 46.6 (SD 22.1) for physical health and 43.4 (SD 18.3) for mental health, where a score of less than 50 would indicate a state of health worse than expected for the mean of the population; whereas the prevalence of poor wellbeing, according to the WHO wellbeing index, was 86% (72 households).

**Interpretation** Our study supports previous research on the damaging health effects of housing precariousness, shown by the poor self-reported health of the women surveyed and a high exposure to different forms of precarity. Israel's occupation policies in East Jerusalem result in insecure residency status and tenure for many households, neglect in the provision of health and public health services, overcrowding, and unsanitary housing and neighbourhood conditions that are hazardous to health.

**Funding** Swiss Development Cooperation.

## Contributors

BB and JN undertook the initial design of this research, with substantial inputs from MM for the design of the qualitative aspect and substantial inputs from Ba-N and RG on design of the quantitative part of the work. MM undertook in-depth interviews and visual ethnography for the ethnographic case studies and conducted the initial analysis of the qualitative findings, to form the basis of quantitative work and the design of survey questionnaires. BN developed the survey tool, with substantial contributions from BB, JN, and RG. BB drafted the initial abstract for the research, with significant contributions from BN, JN, MM, and RG.

## Declaration of interests

We declare no competing interests.

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# Human brucellosis in the southern West Bank, 2015–17: a seroprevalence and molecular characterisation study

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## Abstract

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**Background** Brucellosis is a global zoonotic disease ranked by WHO as being among the top seven neglected zoonoses. After implementing a livestock vaccination strategy in 1998, the incidence rate of human brucellosis in Palestine dropped significantly. However, in 2015 the disease re-emerged with alarming incidence rates similar to those in the period before 1998. The aim of this study was to characterise the strains associated with this episode using genetic and genomic tools.

**Methods** All patients were referred to the department of preventive medicine from several public or private clinics in the southern West Bank due to undulant fever. After a careful analysis of a patients' history to evaluate exposure to *Brucella*, blood samples from patients suspected of brucellosis were collected. Samples positive for the Rose Bengal test with an antibody titre of 1:80 IU/mL or more by *Brucella* standard agglutination test, and not under antibiotic treatment, were further cultured using the BACTEC 9240 blood culture system. DNA was extracted from the positive culture samples and analysed using three biomarkers to validate the presence of the *Brucella* genus, establish the species, and identify the *Brucella melitensis* Rev 1 vaccine strain. Nine randomly chosen isolates were sequenced using targeted next generation sequencing technology to screen for the *rpoB* gene mutations. Multiple-locus variable number of tandem repeats analysis (MLVA) with 16 variable number of tandem repeats markers was used to genotype the isolates and BioNumerics version 7.6 software was used to analyse the data using the categorical coefficient and unweighted pair group method using the arithmetic averages algorithm.

**Findings** Blood samples were obtained from a total of 1324 patients during 2015–17. 704 (53.2%) of 1324 serum samples showed agglutination in the Rose Bengal test and 559 (79.4%) of the 704 were considered seropositive based on a standard agglutination test titre of 1:80 IU/mL or more. Only 130 (23.3%) of the 559 seropositive samples were from patients not under antibiotic treatment. Upon culturing, only 72 (12.9%) of the seropositive samples showed growth signals and were positive by PCR for the *Brucella* genus marker, and all isolates were *B melitensis*. None of the samples were associated with the *B melitensis* Rev 1 vaccine strain. The results of sequencing the *rpoB* gene by next generation sequencing showed four different single nucleotide variations that were not located within the rifampicin resistance-determining region. Using MLVA-16 analysis and the MLVA bank benchmark, the studied isolates were divided into 22 unique genotypes. A hierarchical clustering analysis for the 72 isolates and 18 *B melitensis* global isolates representing four major regions in the Middle East, Europe, Africa, and America, clustered the 73 isolates in the Middle East clade, providing a similarity cutoff value of more than 97% for genotype and more than 75% for clade.

**Interpretation** This study shows that the brucellosis episode of 2015–17 was due to *B melitensis* local isolates and was not associated with the Rev 1 vaccine strain. The results show that MLVA-16 is a useful tool for the public health surveillance of human brucellosis. The present study analysed samples from the Hebron governorate only. It is recommended to include more human and animal samples from different areas in Palestine to understand the molecular epidemiology of brucellosis in Palestine and to make more effective decisions regarding control and treatment programmes.

**Funding** Palestine Polytechnic University.

### Contributors

YA conceived and planned the experiments. BA and KA contributed to sample collection. BA, KA, and AT carried out the experiments. MHA provided the clinical data. BA, YA, and AT contributed to the analysis and interpretation of the results. YA wrote the manuscript with input from BA and AT.

### Declaration of interests

We declare no competing interests.

# Identifying the characteristics of antibacterial resistance in urine specimens of children in the Gaza Strip: a hospital-based cross-sectional study

Ahmed Al-Affi, Khaled Abu El Aish, Hedaya El Jbour, Muna Helless

## Abstract

**Background** Antimicrobial resistance is a challenging issue especially among children due to immaturity of the immune system. Identifying the extent of resistance is the first step in finding an appropriate way to combat it. This study aimed to assess the antibiotic resistance patterns of different bacterial isolates from children's urine specimens.

**Methods** This hospital-based, cross-sectional study was done from Nov 1, 2017, to Dec 31, 2018, and used data from bacterial cultures collected and processed in the departments of medical microbiology governmental hospitals across Gaza Strip. We included all identified urine specimens from inpatient and outpatient clinics of children (ages 1–12 years) irrespective of whether they were admitted to hospital. We excluded children who had missing data or cultures without defined microorganisms or that were contaminated. Identification of bacteria was based on conventional methods (colony morphology, Gram stain, and biochemical tests). Standard disc diffusion drug susceptibility testing was performed after identifying the bacterial isolates. WHO guidelines were followed for data collection and analysis for bacterial antibiotic susceptibility and resistance. Ethics approval for the study was obtained from the Palestinian Ministry of Health. As data were anonymised, consent was not needed for use.

**Findings** Of 7144 urine specimens collected, 1726 (24.2%) showed positive microorganism growth. The three most abundant bacterial microorganisms were *Escherichia coli* (1010 [58.5%]), *Klebsiella* sp (266 [15.4%]), and *Pseudomonas* sp (93 [5.4%]). Resistance of *E coli* to antibiotics was as follows: amoxicillin 96.5% (358 of 371 samples tested), amoxicillin/clavulanic acid 88.3% (188 of 213), cefalexin 66.5% (489 of 735), cefuroxime 49.1% (265 of 540), ceftriaxone 39.3% (268 of 682), gentamicin 19.0% (138 of 729), meropenem 7.4% (nine of 122), and amikacin 1.0% (five of 493). For *Klebsiella* sp, resistance to amoxicillin was 96.0% (96 of 100 samples tested), amoxicillin/clavulanic acid 90.0% (36 of 40), cefalexin 73.8% (141 of 191), ceftriaxone 64.42% (117 of 182), cefuroxime 63.1% (101 of 160), gentamicin 33.3% (64 of 192), and amikacin 0.7% (one of 141). Resistance of *Pseudomonas* sp to cephalosporins was 90.0% (54 of 60 samples tested), cefuroxime 80.8% (42 of 52), ceftriaxone 39.4% (26 of 66), ceftazidime 29.3% (17 of 58), gentamicin 28.0% (19 of 68), and amikacin 3.9% (two of 52).

**Interpretation** Antimicrobial resistance is prevalent among investigated bacteria, especially to first-line and second-line antibiotics. Continued surveillance and a tracking system for multidrug-resistant bacteria are needed. Judicious and rational antibiotic usage is recommended.

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### Contributors

All authors contributed to data collection, AA-A and KAEA managed and analysed the data and wrote the Abstract. All authors reviewed and approved the final version of the Abstract.

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# Initial outcomes of a community health worker programme for patients with type 2 diabetes in refugee camps at the West Bank, occupied Palestinian territory: a retrospective, matched cohort study

Asmaa Rimawi, Henry Louis, David Scales, Jawad Abu Kheiran, Nashat Jawabreh, Sofia Yunez, Masako Horino, Akihiro Seita, Bram Wispelwey

## Abstract

**Background** Non-communicable diseases are the leading cause of mortality in the occupied Palestinian territory, and the burden of diabetes among refugees in the West Bank region of the territory has increased drastically in the past three decades. Community health worker programmes have been effective in controlling diabetes in many parts of the world, but data from the Middle East and north Africa regions and in settings of chronic violence are scarce. This study sought to assess the efficacy of diabetes control with a home-based community health worker programme, Health for Palestine, which included Palestinian refugee community health workers and patients in Aida and Al-Azza Camps in the occupied Palestinian territory.

**Methods** We conducted a retrospective, matched cohort study, over 19 months, comparing the concentrations of haemoglobin A1c in individuals with diabetes cared for by Health for Palestine community health workers (n=30) and in non-health worker individuals with diabetes (n=120), all of whom were refugees who received care at UN Relief and Works Agency clinics. The Health for Palestine community health worker intervention, collectively termed social accompaniment, includes diet and exercise counselling, medication supervision and adherence support, vital signs and glucose monitoring, trauma-informed psychosocial counselling, facilitation of transportation to clinic, and supportive referrals to clinics or hospitals. We tested for significance with multivariable linear regression with robust standard errors, using an ordinary least squares regression of the outcome with and without prespecified covariates.

**Findings** Health for Palestine community health workers had an average 1.4 absolute percentage point (95% CI 0.66–2.1) greater decline in haemoglobin A1c per year than the non-community health worker cohort, after adjustment for potential confounders including smoking status, hypertension, physical activity, and history of myocardial infarction or stroke ( $p < 0.001$ ). Potentially relevant unmeasured confounders include patient proximity to a UN Relief and Works Agency clinic, whether the control patient lived within a refugee camp or nearby, and traumatic events related to the occupation. The unadjusted reduction in haemoglobin A1c in Health for Palestine community health workers with diabetes was 1.2 points (from a baseline value of 8.4% to 7.2%). At the end of the study period, 77% of Health for Palestine community health workers (from a baseline proportion of 50%;  $p = 0.83$ , Fisher's exact analysis) and 46% of non-community health worker participants (from a baseline proportion of 47%;  $p = 0.003$ ) met the haemoglobin A1c target of  $< 8\%$ .

**Interpretation** A community health worker intervention grounded in social accompaniment is associated with improved diabetes control in urban refugee camps and in communities experiencing chronic violence. A low exclusion cutoff for haemoglobin A1c ( $< 6.5\%$ ) might underestimate the programme's effectiveness. Although community health worker programmes are uncommon in the occupied Palestinian territory and the greater region, these results suggest that such programmes can successfully augment existing efforts to improve diabetes control and outcomes.

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### Contributors

AR, DS, HL, and BW contributed to the conception of the work. AR and BW designed the study. AR conducted the investigation, formal analysis, and visualisation of the study. AR and BW wrote the Abstract. AR, HL, DS, SY, and BW revised the Abstract. AR and JAK verified the data. NJ oversaw project administration. MH curated the data. AS and BW supervised the work. 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 and attitudes towards organ donation among students at An-Najah National University: a cross-sectional study

Souad Belkebir, Rawaa Atrash, Nouf Abu-Hussein

## Abstract

**Background** Organ transplantation is the most effective therapy for end-stage organ failure, but there is an organ shortage due to increasing demand and decreasing availability for a multitude of reasons. We investigated awareness and attitudes toward organ donation among university students, who may be future donors.

**Methods** We did a cross-sectional study involving students at An-Najah National University, Nablus, West Bank, occupied Palestinian territory, between December, 2018, and April, 2019. Sociodemographic data and information about knowledge and attitudes towards organ donation were collected with a self-administered validated questionnaire in Arabic. Students were recruited by proportionate stratified random sampling from all 11 university faculties. Convenience sampling was used to obtain the final study sample. All respondents provided written informed consent to participate. SPSS version 21 was used to perform the  $\chi^2$  test and ANOVA and the significance level was set at  $p < 0.05$ . The study was approved by the An-Najah National University Institutional Review Board.

**Findings** 472 students (207 men and 265 women) were included in the study. The mean age of respondents was 21 (SD 3.06) years. 433 (92%) were undergraduates and 39 (8%) were postgraduates. 467 (99%) participants had heard about organ donation. The most common source of information, reported by 261 (56%) students, was mass media (television, internet, newspapers, etc). 360 (76%) of respondents had a positive attitude toward organ donation while alive, with altruism being the most prevalent motivation 276 (77%). Willingness to help a family member was the most common reason for living donation (108 [30%] respondents). 61 (13%) replied that they would donate organs for money. 330 (70%) of 472 reported knowledge of possible risks related to living organ donation, including general weakness 56 (17%) and infection 36 (11%). Willingness to donate after death was reported by 302 (64%) of 472 respondents. We found significant associations between this choice and sex ( $p=0.023$ ) and type of faculty ( $p=0.01$ ). 257 (55%) of 472 did not know whether there is any national law regulating organ donation and 274 (58%) did not know the religious position. Of those positive about donation, 184 (61%) of 302 willing to donate after death said that consent to use organs could be provided by a family member, whereas 266 (74%) of 360 willing to be living donors would make the decision themselves. 148 (31%) would not promote organ donation mainly due to concerns about possible misuse (44 [30%]) and fear of organ trafficking (46 [31%]). Among the sample, one respondent had donated a kidney to a family member.

**Interpretation** The responses to our survey a good level of awareness and knowledge about organ donation among university students. Increased information and discussion on the risks and consequences of organ donation, the relevant legislation, and the position of religion are indicated, especially in the mass media. Finally, addressing the fears, mistrust, and misinformation among students, who are viewed as an educated segment of society and a force for change in their communities, may convert them into goodwill ambassadors for the organ donation cause.

## Funding None.

### Contributors

SB designed the project protocol. RA and NA collected the data. SB, RA, and NA applied for ethical approval and analysed the data. All authors contributed to the writing of the Abstract and read and approved the final version for publication.

### Declaration of interests

We declare no competing interests.

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# Mixing and segregation: a cross sectional study of violent and safe spaces for Palestinians in Israel

Osama Tanous, Mohammad Khatib, Fadi Omar, Sawsan Rezek Marjeh, Ahmad Sheikh-Muhammad

## Abstract

**Background** The role of residential segregation and spatial separation of population groups along racial or ethnic lines is well documented as a factor contributing to health disparities, such as rates of homicide and crime in African Americans. Most of the two million Palestinian citizens in Israel live in segregated, exclusively Palestinian towns whereas approximately 132 000 live in mixed Jewish Palestinian cities that were Palestinian cities before the Palestinian exodus, in 1948, when most inhabitants were expelled, turning the Palestinians who remained into a minority. Despite having higher employment rates, Palestinians in so-called mixed cities live in enclaves with higher poverty, poorer educational facilities, and more intracommunal crime than Palestinian communities in segregated towns. The aim of this study was to assess the prevalence of trust in the Israeli government and in police commitment in crime fighting among Palestinian citizens in Israel in different towns.

**Methods** Data were collected in 2018 using a stratified multistage random sample of 2040 households (n=7985 adults). A scale was computed measuring reports on trust in the government and in the police's commitment in curbing crime (Cronbach's  $\alpha=0.92$ ). Bivariate analyses were done to test for significant associations between the dependent variable of trust in police or government and associated factors. Binary logistic regression was done to check for confounders. The Galilee Society Ethics Committee approved the study.

**Findings** Participants living in mixed cities were more likely to report high levels of violence in their communities (OR 4.3,  $P=0.001$ ) and were less likely to trust the police or the government in curbing crime (odds ratio [OR] 0.32 [95% CI 0.19–0.54];  $p<0.05$ ) than participants in segregated towns. Compared with participants older than 35 years, younger people were more likely to trust the police or government (1.39 [1.12–1.72];  $p<0.05$ ). Muslims were less likely to trust the police or government than Druze and Christians (0.51 [0.35–0.75];  $p<0.05$ ). Those living in communities unrecognised by the Israeli government were less likely to trust the police or government than those living in recognised communities (0.33 [0.22–0.49];  $p<0.05$ ). Those living in large towns (ie, with more than 15 000 inhabitants) and medium-sized towns (with populations of 5000–15 000) were less likely to trust the police or the government (OR 0.47 [95% CI 0.34–0.66];  $p<0.05$  for inhabitants of large towns and 0.65 [0.46–0.91];  $p<0.05$  for inhabitants of medium-sized towns) than people living in small-size towns (ie, with less than 5000 inhabitants). Those unable to cover daily expenses were less likely to trust the police or the government to control crime than those who could cover daily expenses (OR 0.68 [95% CI 0.55–0.85];  $p<0.05$ ). Other variables were not significant.

**Interpretation** Palestinians living in mixed cities view their environment as more violent and have less trust in the government or police's commitment to fight crime. A pattern of urban segregation with urban violence and breakage of social cohesion that is spatially expressed as urban enclaves or so-called purified localities has been used to describe the Palestinian lived experience in mixed cities, and might contribute to worse public health effects than completely segregated Palestinian towns. The lived experience of mixed and segregated livelihood for Palestinian citizens in Israel is substantially different from that of African Americans in the USA, and requires further research. Because violence, crime, and homicide are important public health problems, every effort should be made to measure the prevalence of crime in various communities and uncover its underlying causes so that crime can be effectively reduced.

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### Contributors

MK and AS-M contributed to the design and discussion of the study. FO and SRM contributed to the analysis of the results. OT contributed to the analysis, interpretation, and discussion of the study, and writing of the abstract. All authors have seen and approved the final version of the abstract for publication. All authors had full access to all the data in this abstract and had final responsibility for the decision to submit for publication.

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# National health workforce accreditation and regulation in Palestine: a qualitative assessment

Mohammed AlKhalidi, Shahenaz Najjar, Aisha Al Basuoni, Hassan Abu Obaid, Ibrahim Mughnnamin, Hiba Falana, Haya Sultan, Sali Hafez, Yousef Aljeesh

## Abstract

**Background** The Health Workforce Accreditation and Regulation (HWAR) is a set of policies and processes designed to improve the quality of health services and the performance of health professionals. Various efforts were implemented, mainly by WHO, to advance and strengthen practices and activities of HWAR. In Palestine, HWAR seems to be lagging and to require strengthening at both national policy and institutional levels, based on local evidence. HWAR is rarely investigated in Palestine and possibly also in the Eastern Mediterranean. We aimed to assess the current status of HWAR in Palestine, to identify the challenges, and to propose useful policy and technical actions for the effectiveness of HWAR.

**Methods** We did a qualitative assessment with a purposive sampling strategy to identify key informants from health authorities and institutions in government institutions (Palestinian Ministry of Health and National Legislative Council), academia (universities), and private and non-governmental organisations. Ethical and administration approvals were obtained from the Helsinki Committee at the Palestinian Health Research Council. The study was implemented from mid-October to mid-November, 2019. 22 in-depth interviews were done with key personnel from leadership and policy levels, including health policy makers, experts, and academics (six female, 16 male). Open questions in the interviews covered HWAR domains: conceptual, governance and policy, technical practices, resource and capacity, and gaps and solutions. Triangulated qualitative methods (thematic and ground theory) were used for data analysis and management.

**Findings** We found a lack of understanding of HWAR, and perceptions of HWAR were inconsistent. Despite the existence of a strong legal framework for HWAR and an abundance of untapped skillful health workers, graduates, and students in Palestine and abroad, the majority of participants had a negative view of HWAR, perceiving it as fragmented, poorly regulated, and poorly coordinated. The governing system for HWAR was described as having no specific body or no clear mechanisms of operation. Interviewees reported that some existing accreditation and regulatory standards are well applied but that most need to be updated, reviewed, and enforced at a larger scale. They also reported that HWAR regulatory, executive, and education stakeholders have no consensus on HWAR governance, which is driven by individual initiatives and capacity rather than a systematic evidence-based approach. Overall, the participants described HWAR practices and resources as of low quality. Benefits of a well-established HWAR system and mechanism were suggested, such as an increase in the quality of services, patient safety, trust, and satisfaction with the performance of health system, and a reduction in resource waste. Factors affecting HWAR and the challenges for its implementation were identified—eg, political instability, deficit of education and training, shortage of resources and capacities, and lack of governance and oversight. Actionable solutions at the level of the health system, institutions, and individuals were proposed, establishing a unified and effective HWAR governance structure, policy and regulations, and guidelines and standards for practices.

**Interpretation** Interviewees emphasised the importance of HWAR as a key pillar of health system governance for improving health care and achieving universal health coverage. HWAR national policy and guidelines need substantial reform to tackle poor implementation, communication, standardisation, monitoring, and evaluation. Stakeholders, ministries, syndicates, and academic institutions should work together through an integrated national accreditation and regulation system. Interviewees suggested that system reform must be driven by a common vision, well-established guidelines, and an accreditation and regulation policy for better awareness, best practices, and effective mechanisms.

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## Contributors

MA contributed to conception, methodological design, data analysis, oversight and leadership of the study. MA and SN contributed to drafting and revision of the Abstract. SN and HA contributed to data collection. SH contributed to data analysis and writing and revision of the Abstract. SN, SH, IM, HF, HS, HA, and AA contributed to writing of Background, Methods, and Interpretation. YA contributed to conception and design of the study and revision of the Abstract. All authors saw and approved the final version for publication.

## Declaration of interests

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# Online learning in nursing education: a qualitative study in occupied Palestinian territory

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## Abstract

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**Background** Online learning has been shown to have a significant effect on education in the 21st century, and it has become indispensable in nursing education because of the requirement to connect theoretical courses with hospital-based practice. Due to the COVID-19 pandemic, education has shifted abruptly away from traditional face-to-face instruction and towards distance learning. This study explores the experience of online education during COVID-19 from the perspectives of nursing educators, graduate students, and undergraduate students in two universities in the occupied Palestinian territory

**Method** A qualitative study adopting focus group interviews as a data collection method was conducted from September to October, 2020, in two Palestinian universities: Birzeit University in Ramallah city and Arab American University in Jenin city. A homogeneous purposeful sampling strategy was adopted to recruit participants. The data were analysed using an inductive thematic analysis. Ethical approval for the research was obtained from the ethics committees of both universities.

**Findings** Seven focus groups were conducted. Of these, four focus groups involved undergraduate students (n=30), one involved postgraduate students (n=9), and two involved nursing educators (n=14). The nursing educators and students reported that they faced several challenges when they were required to switch to online learning. The participants perceived online education to be inefficient, particularly for clinical courses, because they perceived difficulties in providing nursing students with the necessary skills in practice. In addition, they reported that a lack of resources harmed the students' ability to receive a high-quality health nursing education. Some undergraduate students mentioned that when they abruptly switched to online education, certain essential resources such as the internet, library, books, smartphones, laptops, and a quiet environment were unavailable. Furthermore, nursing educators and students perceived the lack of face-to-face interaction imposed by the abrupt shift to online education as a substantial challenge. Nursing educators reported that they encountered difficulties with student evaluation. They recognised that online examinations are not as valid as those held on campus as they believed that grades had been inflated as a result of students utilising alternative online resources to answer exam questions. Finally, home environments were viewed as a barrier, adding to the difficulty of transitioning from the university to the home environment.

**Interpretation** Continuous training of educators is imperative for increasing the use of communication and technology in nursing education. There is a need for updated policies to avoid the perceived negative consequences of online learning and to maximise its benefits. The findings suggest some solutions to overcome these challenges. For example, preparing the nursing educators and students to use technology could relieve the magnitude of the problems that arise when a sudden switch to online education occurs.

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### Contributors

MA, IA-R, MMD, MKJ, IAK, and BD 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 intellectual content. 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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# Oral health problems among patients with type 2 diabetes attending UNRWA health centres in Gaza governorates: a cross-sectional study

Emad Alqedra, Yousef Aljeesh

## Abstract

**Background** Oral health is an essential component of general health. Oral diseases have a negative social impact and adverse consequences on quality of life, while their treatment places considerable economic burden on individuals, communities, and countries. As diabetes can have oral implications, this study aimed to assess oral health problems among patients with type 2 diabetes attending UNRWA health centres in Gaza governorates.

**Methods** This was an analytical cross-sectional study. 406 patients aged 35–65 years with type 2 diabetes (243 female, 163 male) were selected by systematic random sampling from five UNRWA health centres. WHO's basic methods tools (the standard oral health assessment form and WHO oral health questionnaire for adults) were used to collect data and assess oral health. Ethical and administrative approvals were obtained from the Helsinki Committee and Chief of the Department of Health, UNRWA Gaza, respectively.

**Findings** 136 (36%) of 374 participants with natural teeth never brushed their teeth and only 62 (17%) brushed their teeth twice or more per day. 219 (54%) of 406 participants had not experienced pain or discomfort associated with the teeth or mouth during the past 12 months. The mean decayed missing filled teeth (DMFT) score was 18·6. Only 61 (16·4%) of 374 participants had no gingival bleeding. The mean number of teeth showing gingival bleeding was 9·91 and showing no gingival bleeding was 9·79, and the mean number of teeth not present for the bleeding test was 9·14. Although nine (2%) of 374 participants had no periodontal pockets, the mean number of teeth with no pocket was 7·15, with a pocket of 4–5 mm was 7·84, with a pocket of 6 mm or more was 4·96, and that were not present for pocket measurement was 9·13. No treatment was needed for 34 (8%) of 406 participants, whereas prompt treatment (including scaling) was needed for 285 (70%) participants. The DMFT index was significantly associated with age, educational level, employment status, frequency of teeth brushing, duration of diabetes, and glycated haemoglobin (HbA<sub>1c</sub>) level. It was higher in male participants than in female participants, and in participants under the deep poverty line (as defined by the Palestinian Central Bureau of Statistics 2014). Gingival bleeding was significantly associated with sex (women were more likely to not have bleeding than were men) and frequency of tooth brushing, but there was no statistically significant association between gingival bleeding and periodontal pocket, sociodemographic factors, the HbA<sub>1c</sub> level, or the duration of diabetes.

**Interpretation** Patients with type 2 diabetes have many oral health problems, and most are unaware of the oral implications of diabetes. A new UNRWA strategy for oral health should be devised to increase the awareness of patients and health providers about the oral implications of diabetes. In view of the low levels of awareness and personal dental care, similar studies should be conducted in the general population, in school students, and in high-risk groups, including pregnant women.

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### Contributors

EA conceived the study, collected and analysed the data with support from YA, and wrote the Abstract. YA supervised the study. Both authors have seen and approved the final version of the Abstract for publication.

### Declaration of interests

EA is a dental surgeon in the Department of Health, UNRWA Gaza Field Office, and YA is Dean of the Faculty of Nursing, Islamic University of Gaza, occupied Palestinian territory. We declare no other competing interests.

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# Perceptions of violence and mistrust in authorities among Palestinians in Israel, an unrecognised public health crisis: a cross-sectional study

Mohammad Khatib, Ahmad Sheikh-Muhammad, Fadi Omar, Sawsan Rezek Marjeh, Osama Tanous

## Abstract

**Background** Between 1948 and 2020, Palestinians living in Israel have seen an 11-times increase in population density. Palestinian citizens of Israel (PCI) comprise 20% of the population, restricted to living in 2.7% of the land. The effects of the resulting overcrowding are spatial, political, cultural, economic, and administrative and are also associated with intracommunal crime and violence. Between 2000–17, from 122 annual homicide cases in Israel, 79 (65%) victims were PCI. Palestinians have a 5.5 times higher risk of dying from homicide than Jewish citizens of Israel. 2021 saw a peak in homicide rates, where 126 (74%) of the 170 homicide cases in Israel were among PCI. 83% of homicides among PCI were a result of gunshots, with more than 400 000 illegal firearms estimated to circulate among the Palestinian community in Israel. Yet, only 23% of homicide cases among PCI were solved by the police compared with 73% of cases among Jewish citizens of Israel. This study examines the attitudes of PCI towards violence, crime, safety, and trust in the Israeli police.

**Methods** We did a cross-sectional study; the survey form included demographic data and questions about exposure and attitudes towards safety, violence, crime, and the police and government handling of crime. Participants were all PCI living in Palestinian towns and in mixed cities in Palestinian neighbourhoods. Participants were randomly chosen from 68 towns, and conducted in private homes by trained surveyors. The study sample was a stratified multi-stage random sample, divided into four levels of stratification: region (north, centre, or south of Israel), community size (small [ $<5000$ ], medium [5000–15 000], or large [ $>15\,000$ ]), locality classification (cities or villages), and locality type (recognised and unrecognised as official towns by the state). The main outcomes assessed were participant perceptions of the prevalence in violence among PCI and the authorities' commitment to curb it. The Galilee Society Ethics Committee approved the study and informed consent was obtained from all participants.

**Findings** Interviews were done in 2040 households housing 7985 family members, recruited and interviewed in 2018. Personal interviews were conducted with one person per family. Of these 2040 interviews, 1970 interviews were included in the analysis. 1283 (65.1%) of 1970 participants estimated the prevalence of violence as being high or moderate in their towns. 958 (48.6%) participants estimated that violence has increased in their town during the past year. 1062 (53.9%) participants that they could be a possible target of violence. 1027 (52.1%) participants reported that crime is the biggest problem that the Palestinian community in Israel faces, followed by racist laws (436 [22.1%]) and the difficult economic situation (282 [14.3%]). 1474 (74.8%) participants reported that the use of weapons has become normal in everyday disputes. 1496 (75.9%) reported that the state is interested in the spread of violence in the Palestinian towns in Israel. 1728 (87.7%) participants stated that an absence of governmental interest in addressing the problem of unauthorised weapons is the cause of their spread, and 1634 (82.9%) participants stated that police complicity is a cause of the spread of unauthorised weapons. 1411 (71.6%) participants disagreed with the statement that the Israeli police deals with violence seriously.

**Interpretation** PCI perceive a high exposure to violence within their communities, with most participants reporting that communal violence is linked to the Israeli government and police being disinterested in addressing the problem, and the complicity of the Israeli police (which reflects a mistrust in the Israeli government and police force, and that crime among PCI becomes a justification to further criminalise, stigmatise, and police these communities). Given that violence, crime, and homicide are major causes of morbidity and mortality and thus urgent public health problems, every effort should be made to advocate for addressing these problems among PCI, especially among medical and health-care communities.

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## Contributors

MK and AS-M contributed to the design and discussion of the study. FO and SRM contributed to the analysis of the results. OT contributed to the analysis, interpretation, and discussion of the study, and writing of the abstract. RG contributed to the editing and framing of the abstract. All authors have seen and approved the final version of the abstract for publication. All authors had full access to all the data in this abstract and had final responsibility for the decision to submit for publication.

## Declaration of interests

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# Prevalence and risk factors of chronic kidney disease in Palestinian patients with diabetes: a cross-sectional study

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## Abstract

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**Background** Chronic kidney disease (CKD) is a worldwide public health problem because of high morbidity and mortality and high costs of treatment. Diabetes is a major risk factor for development and progression of CKD. In this study, we aimed to assess the prevalence of CKD among patients with type 2 diabetes treated in primary health care (PHC) centres in the north area of West Bank, occupied Palestinian territory.

**Methods** A cross-sectional study design was used. A sample size of 385 patients was calculated based on following sample size formula  $n = Z^2 \times P \times (1 - P) / d^2$ , where  $p$  is the expected CKD prevalence and  $d$  is the margin of error. All patients with diabetes are referred to their district's PHC clinics for follow-up and management, with 25·35 patients being seen per day. Patients eligible for this study had type 2 diabetes, were 18 years or older. Those with type 1 diabetes or gestational diabetes, women who were pregnant, and those who did not have at least two creatinine measurements at least 3 months apart were excluded from the study. Patients were recruited at random. Between September and December, 2018, every third patient on a given day's client list was chosen. Data were obtained from personal interviews with patients and from their electronic health records. Collected data included patients' characteristics, creatinine levels, blood pressure, glycated haemoglobin A<sub>1c</sub> (HbA<sub>1c</sub>), and duration of hypertension and diabetes. Estimated glomerular filtration rate was calculated using the Chronic Kidney Disease Epidemiology Collaboration equation. CKD was staged according to the Kidney Disease Improving Global Outcomes System 2012 guidelines. We did univariate and multivariate analyses in SPSS version 20. The threshold for significance was  $p < 0\cdot05$ . The study was approved by Al-Najah National University Institutional Review Board and the Palestinian Ministry of Health. Patients provided written informed consent.

**Findings** We recruited 386 patients with diabetes (192 [50%] men, 194 [50%] women) with a mean age of 60·6 (10·4) years. The mean duration of diabetes was 12·4 years (range 3·9–20·9) and HbA<sub>1c</sub> concentrations ranged from 6·39% to 10·47% (mean 8·4% SD 2·0). The prevalence of CKD was 24% (95% CI 19–28). Among these, 76 (20%) had stage 3, ten (3%) had stage 4, and five (1%) had stage 5 CKD. In multivariate logistic regression, CKD was significantly associated with hypertension (adjusted odds ratio 5·7, 95% CI 2·2–15·2·2,  $p = 0\cdot0052$ ), smoking (2·3, 1·3–4·2,  $p = 0\cdot0134$ ), and age 60 years or older (3·2, 1·8–5·9,  $p < 0\cdot0001$ ).

**Interpretation** CKD was common among adults with diabetes attending PHC centres in this study. Screening of patients with diabetes to detect CKD at earlier stages and implementation of more aggressive treatment modalities for diabetes as well as other important risk factors, especially hypertension and smoking are recommended.

**Funding** None.

### Contributors

All authors were involved in developing the study protocol and methodology. DM, OA, and MA collected the data. All authors analysed and interpreted of data, wrote the Abstract, and approved the final version of the Abstract for submission.

### Declaration of interests

We declare no competing interests.

### Acknowledgments

We thank the Palestinian Ministry of Health and An-Najah National University for support and for facilitating our access to primary health care centres. We also thank primary health-care physicians and the study participants.

# Prevention of Rhesus-alloimmunisation: a cost-effectiveness analysis

Haly S Zourob, Khaled I Abu El Aish

## Abstract

**Background** Rhesus disease of a newborn baby results from the entrance of anti-D antibodies of the rhesus factor D (RhD)-negative mother into the RhD positive foetal bloodstream. This transfer might cause stillbirths, neonatal deaths, or severe hyperbilirubinemia, which can develop into irreversible brain damage. In current practice, anti-D immunoglobulin is administered to RhD-negative women within 72 h after the delivery of RhD-positive newborn babies. During the antepartum period, it is given in events associated with placental trauma or disruption of the feto-maternal interface. This review was conducted to analyse the cost-effectiveness of the introduction of worldwide guidelines for the administration of anti-D immunoglobulin at 28 weeks to all RhD negative mothers with RhD-positive spouses in Palestine.

**Methods** This was a cost-effective analysis and a literature review of the international guidelines about RhD alloimmunisation prophylaxis. The US, Australian, Canadian, UK, and WHO guidelines were reviewed. A cost-effective analysis was done, and the primary outcomes were the number needed to treat and the overall cost of the treatment. Estimations were done for the cost of prevention to every case.

**Findings** All reviewed guidelines recommend that the administration of anti-D immunoglobulin is given routinely to all RhD-negative non-sensitised women at 28 weeks gestation, when the fetal blood type is unknown or the father is known to be RhD-positive. This practice is cost-effective, hence the implementation of the new guideline will cost approximately US\$700 000 in Palestine (\$400 000 in the West Bank and \$300 000 in the Gaza Strip). The implementation of this guideline will prevent 148 cases (85 in the West Bank and 63 in the Gaza Strip) from further RhD alloimmunisation. The net cost of prevention of every case is approximately \$4750.

**Interpretation** Routine administration of anti-D immunoglobulin to all RhD-negative non-sensitised women at 28 weeks gestation, when the spouses are RhD-positive, is cost-effective. An implementation programme for RhD alloimmunisation prophylaxis will be of great value.

**Funding** None.

### Contributors

HSZ contributed to the study procedure, conceptualisation of the study, study design, and the revision of the Abstract. KIAEA contributed to the conceptualisation of the study, study design, data collection, statistical analysis, the writing and revision of the Abstract, input for data analysis, and data management.

### Declaration of interests

We declare no competing interests.

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# Quality of life of patients with multiple sclerosis receiving medical care at Palestinian Ministry of Health Directorates in the West Bank, occupied Palestinian territory, and associated factors: a cross-sectional survey

Doaa Altarifi, Maisa Lotfi, Rula Ghandour, Rita Giacaman

## Abstract

**Background** Multiple sclerosis is a neurological disease in which the immune system attacks the myelin sheath of axons, leading to symptoms that include loss of function, fatigue, blindness, and loss of balance. It is more common in women than in men. The disease has detrimental effects on patients' health-related quality of life (QOL), physically, socially, and emotionally. This study assessed the QOL of patients with multiple sclerosis receiving medical care at Palestinian Ministry of Health directorates.

**Methods** In this cross-sectional study, we approached all patients with multiple sclerosis receiving medical care in Ministry of Health clinics in all districts of the West Bank. In total, 150 patients were willing to participate. Participants were aged between 20 and 65 years and receiving treatment in ten directorates in the West Bank. We collected data from patients when they visited the clinics to collect medicines. The multiple sclerosis quality of life-54 (MSQOL-54) instrument is a self-administered questionnaire that is divided into two sections, the first comprising questions on basic demographic and socioeconomic characteristics, and the second focusing on the patient's QOL by assessing physical, mental, and emotional health factors. The MSQOL-54 scale scores were created using the Likert method by averaging items within the scales, then row scores were linearly transformed into 0–100 scales. The physical health composite score encompassed physical function health perceptions, energy and fatigue, and role limitations (relating to physical pain, sexual function, social function, and health distress). The mental health composite score encompassed health distress, overall QOL, emotional wellbeing, and role limitations (relating to emotional and cognitive function). These constructed variables were multiplied by the weight given to each variable to give the subtotal for each composite. Univariate analyses were initially performed using frequencies for categorical variables. Mean and SD were calculated for continuous variables.

**Findings** Patients had a mean age of 35 years (SD 10·90), and 103 (69%) were women. 43 (29%) lived in the north of the West Bank, 68 (45%) lived in the middle, and 39 (26%) in the south. 78 (52%) had a university degree, and 101 (67%) were married. 114 (76%) had a monthly income equal to the average wage in the occupied Palestinian territory. 77 (51%) were unemployed and 82 (55%) lived in cities. 109 (73%) were diagnosed with multiple sclerosis in the first year of the appearance of symptoms, and 127 (85%) took medication regularly. 76 (51%) benefitted from medication. 149 (99%) were diagnosed as having relapsing remitting multiple sclerosis. The overall mean QOL score was 58·71 (SD 22·06). For role limitation, the mean QOL scores relating to physical and emotional problems were 32 (SD 39·51) and 32 (40·11), to physical function was 35·8 (20·82), to emotional wellbeing was 45·94 (17·88), to fatigue was 40·74 (17·91), to health perception was 42·86 (21·80), and to health distress was 3·19 (1·38). The mean physical and mental health composite scores were 40·94 (38·97) and 39·91 (36·67), respectively. Similar physical and mental components of the QOL scores were found in patients with multiple sclerosis in studies from Bosnia and Herzegovina, Slovenia, and Italy.

**Interpretation** This study highlights the importance of assessing the QOL of patients with multiple sclerosis in the occupied Palestinian territory. All patients had low physical and mental health-related QOL scores. For the participants in this study, the most affected components of QOL were those related to role limitations due to physical and emotional problems, physical function, emotional wellbeing, fatigue, and health perception. Health distress was found to be the most powerful predictor of QOL of patients with multiple sclerosis. The results could potentially assist the Palestinian Ministry of Health in developing plans to improve the QOL of patients with multiple sclerosis.

**Funding** None.

### Contributors

DT wrote the Abstract with help from MA in writing the Background and Discussion. RGh contributed to data analysis. RGi supervised and checked the methods and results. 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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# Quantitative microbial risk assessment to estimate annual infection risk and disease burden attributable to *Escherichia coli* O157:H7 in drinking water in the Gaza Strip: a prospective study

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## Abstract

**Background** Quantitative microbial risk assessment (QMRA) with Monte Carlo simulation is the process of estimating the risk of infection through exposure to microorganisms. Worldwide, certain Shiga-toxin-producing types of *Escherichia coli*, such as *E coli* O157:H7, have been recognised as pathogens leading to waterborne outbreaks of infection. We attempted to estimate the annual infection risk and the burden of disease posed by *E coli* O157:H7 in drinking water in the Gaza strip.

**Methods** In this prospective study, we applied the typical four steps of the QMRA technique: hazard identification, exposure assessment, dose-response analysis, and risk characterisation. Samples were collected between March, 2018, and January, 2019 from seven reference points in the drinking water supply from catchment to consumers' taps (water wells, small-scale water desalination plants, tanker trucks, desalinated water at households, municipal water at households, private wells, and private well water at households). Microbiological analysis was performed to identify *E coli* O157:H7 and log reduction values (LRVs) were calculated using probabilistic modelling for five catchment routes: water wells to household (LRV1), catchment well to desalination plant (LRV2), desalination plant to tanker truck (LRV3), tanker truck to household (LRV4), and private well to household (LRV5). The most probable number (MPN) table was used to obtain the MPN of *E coli* per 100 mL water sample. The probability of being infected through intake of *E coli* O157:H7 was estimated with a  $\beta$ -Poisson dose-response model. The estimated magnitude of health risk and burden of disease were determined using a stochastic modelling technique. Values were compared with the health-target-based risk values of the United States Environmental Protection Agency (EPA) target  $\leq 10$ –4 infection cases per-person per-year, and the WHO burden of disease values (target  $\leq 10$ –6 disability adjusted life-years [DALYs] per-person per-year).

**Findings** Among 1317 water samples collected, *E coli* O157:H7 was detected in 91 (6.9%). The mean MPN was 1.97 (SD 9.74)/100 mL and the maximum was 112/100 mL. Negative LRVs were found in tanker trucks (LRV3 –1.465) and private household water wells (LRV5 –1.465), confirming water contamination. The risk model showed that the median of estimated annual risk of infection through consumption of water contaminated with *E coli* O157:H7 was  $3.21 \times 10^{-01}$  per-person per-year, which was about six logs higher than the EPA acceptable infection risk. The median disease burden was about  $3.21 \times 10^{-01}$  DALY per-person per-year, which greatly exceeded the WHO reference level.

**Interpretation** This study suggests the applicability and effectiveness of QMRA and highlights the necessity for a proactive strategy to incorporate a multibarrier approach to mitigate public health risks posed by contaminated drinking water.

**Funding** None.

## Contributors

SA participated in the study design and data collection. MH and KZ did the statistical analysis. AHM wrote the Abstract with input from RN. AMH and MY supervised the study and participated in the draft review. 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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# Risk factors for hearing impairment in infants and toddlers in the Gaza governorates: a case-control study

Randa F Zaqqout, Bassam Abu Hamad

## Abstract

**Background** The risk factors for congenital or early-onset hearing loss vary across countries. This study aimed to explore the risk factors for hearing impairment in children younger than 3 years in Gaza governorates to inform preventive strategies.

**Methods** This case-control study started in February, 2017, and ended in July, 2018. Ethical approval was obtained from the Helsinki Committee in Palestine, a national committee established in 1986 that reviews all proposals for health research, and whose approval is a requirement before any health research in Palestine. Data were collected through face-to-face household interviews. Cases were defined as children diagnosed with moderate, severe, or profound sensorineural hearing impairment within the first 3 years of life ( $n=169$ ), whereas controls were children who had been screened and found to have unimpaired hearing ( $n=169$ ). Cases and controls were randomly selected through a systematic sampling approach from the screening lists of the Atfaluna Society for Deaf Children, a registered Palestinian non-governmental organisation that has been working in the field of deaf education and allied services since 1992 and that regularly leads hearing screening campaign for neonates and children younger than 5 years in primary health centres over all Gaza governorates. SPSS version 21 was used for data entry and logistic regression analysis with the chi-square test, odds ratio, and t test.

**Findings** Maternal unemployment was more prevalent in cases than in controls ( $p=0.025$ ). Having a family history and consanguinity were more prevalent in cases than in controls ( $p=0.001$  for both). Taking folic acid during the preconception period ( $p=0.007$ ) and iron supplements during pregnancy ( $p=0.002$ ) were associated with a lower prevalence of hearing loss. The proportion of mothers of cases who were registered as having received antenatal care during the first trimester was lower for cases than for controls (odds ratio 0.341 [95% CI 0.181–0.640];  $p=0.002$ ). Prematurity ( $p=0.006$ ), low birthweight ( $p<0.0001$ ), and admission to a neonatal intensive care unit ( $p=0.002$ ) were strongly associated with hearing impairments. The study also showed that children with recurrent otitis media were at a greater risk of hearing impairment ( $p<0.0001$ ), as were children who had been exposed to sporadic loud noises, such as nearby bombing, or continuous loud noise at home, such as from nearby factories. ( $p=0.01$ ).

**Interpretation** The study concluded that hearing impairment among children younger than 3 years is associated with a wide array of socioeconomic, health, and environmental vulnerabilities. A health promotion programme should be established to address consanguinity, prematurity prevention, and timely and appropriate preconception and antenatal care, alongside universal screening for all children, particularly those at risk as identified in this study.

**Funding** None.

### Contributors

RFZ did the statistical analysis and wrote the abstract with revision and auditing by BAH. 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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# Risk factors for the double burden of malnutrition in children younger than 5 years in the Gaza Strip: a systematic review

Sanaa Al Najjar, Tamer Al Shaer

## Abstract

**Background** Malnutrition, the coexistence of both undernutrition and obesity, poses a considerable public health and economic burden worldwide. Globally, undernutrition is the largest cause of death in children younger than 5 years, being responsible for 3·1 million, or approximately 45%, of deaths in this population. Conversely, WHO estimated that, in 2016, 41 million children younger than 5 years were overweight or obese. The global problem of malnutrition can be ascribed to changing dietary and lifestyle habits and to the epidemiological transition of most countries. Developing communities, such as in the Gaza Strip, are thus subject to a double burden of preexisting widespread undernutrition and emerging obesity and chronic diseases.

**Methods** A systematic search and literature review was done in PubMed, Embase, and the Cochrane Library for articles discussing risk factors for obesity and undernutrition among Palestinians. Additionally, we reviewed UN Relief and Works Agency and Ministry of Health of the occupied Palestinian territory health annual reports. We included all original, population-based studies, irrespective of their design or publication status, language, or age of participants. We independently screened titles, abstracts, and full texts for eligibility, then extracted relevant data and assessed the risk of bias. We pooled the most common reported risk factors for the double burden of malnutrition in the occupied Palestinian territories (Gaza Strip and West Bank) for the period of June, 2017, to June, 2018.

**Findings** Of 432 publications retrieved, we included 23 eligible articles. The pooled risk factors for undernutrition and obesity in the Gaza Strip were poverty and poor socioeconomic situations (63%), poor awareness of healthy diets and lifestyle among communities (26%), developmental transition and urbanisation (6%), and others (5%). The political situation and the blockade in the Gaza Strip contributed to different weights of the risk factors above mentioned. All studies had a moderate to high risk of bias, especially selection bias. Annual health reports of UN Relief and Works Agency and Ministry of Health of the occupied Palestinian territory showed that overweight was in high prevalence in children younger than 5 years (6·5%), as were other problems of undernutrition, such as stunting (7·1%).

**Interpretation** The poor political and socioeconomic situation in Gaza compound the risk factors contributing to the high prevalence of malnutrition in the area. In addition, awareness about healthy lifestyles is scarce, which increases the prevalence of overweight and obesity in children. Urbanisation and developmental factors such as globalisation and technological developments added a small risk of overweight and obesity.

**Funding** None.

### Contributors

SAN wrote the proposal, did the data analysis and interpretation, and wrote and revised the abstract. TAS and SAN did the data collection, data management, and provided input for data analysis.

### Declaration of interests

We declare no competing interests.

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# Severity assessment and management of community-acquired pneumonia: a retrospective clinical audit

Hamza Yazji, Mohammed Saeb Al-Jadba, Mohammed Sammour, Mohammed Alkhatib, Alaa-Eldeen Elmassry

## Abstract

**Background** Community-acquired pneumonia (CAP) is one of the most common infectious diseases and is an important cause of mortality and morbidity worldwide. Appropriate management of CAP includes accurate assessment of disease severity at the time of admission, to indicate the optimal intervention. This clinical audit aimed to evaluate the severity assessment and management of patients who presented with CAP to the emergency department at Nasser Hospital, Khan Younis, Gaza Strip, occupied Palestinian territory.

**Methods** A retrospective study was conducted of the 100 patients (aged 18–88 years) admitted to Nasser Hospital with CAP between November, 2017, and April, 2018, who met inclusion criteria and gave consent, and for whom we could retrieve data. Patients with hospital-acquired pneumonia, aspiration pneumonia, and exacerbation of chronic obstructive pulmonary disease or asthma by infection were excluded from the study. The audit standards were based on the Nasser Hospital local protocol, which is adapted from the guidelines of the Infectious Diseases Society of America and American Thoracic Society on the management of CAP in adults (March, 2007). SPSS Statistics (v.23.0) was used for data management and statistical analysis. We obtained verbal patient consent, and ethical approval was obtained from the Ministry of Health.

**Findings** The mean age of patients was 57 years (SD 20.4). 49 (49%) patients were male and 51 (51%) were female. Respiratory rate and oxygen saturation were documented for 11 (11%) and 57 (57%) patients, respectively. Blood urea nitrogen level was analysed for all patients. All of the variables of the CURB-65 score were documented for 11 patients (11%), whereas four of five variables were documented for 72 patients (72%). The respiratory rate was the least documented variable (11%). Microbiological diagnosis (blood and sputum culture) was done for six patients (6%). Patients received a combination of one of the third-generation cephalosporins (ceftriaxone, cefotaxime, ceftazidime; 100% of patients) plus azithromycin (89%), doxycycline (5%), trovafloxacin (3%), or gentamicin (3%). In total, 94 patients (94%) were prescribed both the recommended antibiotics and the appropriate dose and duration. None of the patients received the first dose of antibiotics during their stay in the emergency department. 66 patients (66%) received corticosteroids (31 received intramuscular dexamethasone 4 mg, 27 received oral prednisone 20 mg, and 8 received intravenous hydrocortisone 100 mg).

**Interpretation** There was poor adherence to the CURB-65 score system, despite its benefits in terms of assessment and classification of CAP severity. We also found evidence of inappropriate prescription of corticosteroids, which are recommended for severe pneumonia only. Furthermore, there was no administration of the initial dose of antibiotic in the emergency department, despite its association with lower mortality. More successful implementation of the guidelines will require regular re-auditing and continuing medical education.

**Funding** None.

### Contributors

HY carried out data analysis and wrote the Abstract. MAJ designed the study and collected data. MS collected data. MAK reviewed the Abstract. AE 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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# Shift work and job satisfaction among Palestinian nurses: a cross-sectional study

Yousef Jaradat, Rita Bast-Pettersen, Espen Bjertness

## Abstract

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**Background** Rotating shift work is associated with job dissatisfaction, sleeping disturbances, and health problems compared with working only in the daytime. Whether the relationship between rotating shift work and job satisfaction differs between the sexes among nurses in occupied Palestinian territory is unclear. We investigated this relationship and compared it with that among regular day workers.

**Methods** We did a cross-sectional study in Hebron district in August to October, 2008, involving all registered nurses with at least 1 year of practice. Those who worked fixed evening or night shifts or who were on leave were excluded. Job satisfaction was assessed with the Generic Job Satisfaction scale, containing ten items with scores from 1 to 5; a higher score indicated a higher (better) job satisfaction. Associations were assessed with  $\beta$  coefficients and 95% CIs and  $\chi^2$  tests in linear regression analyses. Statistical analyses were done with Stata (version 10). The threshold for significance was set at  $p=0.05$ . The study was approved by the Palestinian Ministry of Health. Written informed consent was obtained from all participants.

**Findings** Of 472 eligible nurses, 426 (90%) were included in the study: 259 women and 167 men, among whom 217 worked shifts and 209 who worked only during the daytime. The mean job satisfaction score among female nurses was 32.6 (SD 6.4) and among male nurses was 31.7 (SD 7.0). Crude analyses showed that male and female shift workers reported lower job satisfaction than those working day shifts (mean score 30.8 [SD 6.5] vs 33.8 [6.4]). After adjustment for age, number of children, years of education, and job title, this effect remained statistically significant only among male nurses, as the men with rotating shift-work reported job scores 3.5 points lower than those working only during the daytime ( $\beta$  coefficient  $-3.5$ , 95% CI  $-5.9$  to  $-1.1$ ;  $p=0.005$ ) whereas for women the  $\beta$  coefficient value was 0.10 (95% CI  $-1.8$  to 2.1,  $p=0.90$ ).

**Interpretation** Male nurses working rotating shift patterns reported lower job satisfaction than men working only during the daytime, whereas no difference was found for female nurses. Because both exposure and outcome were measured using self-reported information and the study design was cross-sectional, interpretation of the results should be made with caution. However, further studies should investigate whether shift work affects the quality of patients' care.

**Funding** Norwegian Programme for Development, Research and Education.

### Contributors

YJ, RB-P, and EB designed the study. YJ was responsible for the data collection and monitoring. YJ and RB-P prepared the datasets and did the preliminary analysis. All authors participated in the interpretation of the results. All authors contributed to writing the Abstract and reviewed and approved the final version.

### Declaration of interests

We declare no competing interests.

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# The prevalence of diabetic retinopathy in the occupied Palestinian territories: a national cross-sectional study

Nahed Mikki, Islay Mactaggart

## Abstract

**Background** Diabetic retinopathy is a complication of diabetes that affects the eyes and can lead to blindness if not adequately managed. No national or population-based estimates of diabetic retinopathy in Palestine exist. High-quality ophthalmic services are not available at the primary health care level for patients with diabetes in all sectors. Specialised eye centres are lacking. St John of Jerusalem Eye Hospital Group, which consists of five facilities in the West Bank and Gaza Strip, is the only provider of expert eye care in Palestine. The aim of this study was to determine the population prevalence of diabetic retinopathy among people with diabetes aged 50 years and older in Palestine.

**Methods** This survey was part of a larger population-based survey using the rapid assessment of avoidable blindness (RAAB) methodology to estimate prevalence of vision impairment, blindness, and disability in individuals aged 50 years and older in Palestine. It was a nationally representative, cross-sectional, population-based survey in Gaza Strip and West Bank. Based on an expected prevalence of blindness of 3.4% in individuals aged 50 years and older, 20% precision level, 95% confidence level, 10% non-response rate, and a design effect of 1.4 to account for clustering, a sample size of 4224 participants aged 50 years and older was determined. 69 clusters in the West Bank and 52 clusters in the Gaza Strip were selected with probability proportionate to size from a list of areas from the Palestinian Central Bureau of Statistics population and housing census of 2017. Within each cluster, 35 people aged 50 years or older were randomly selected for examination in their homes. Three teams collected data; each consisted of a nurse and an ophthalmologist. Dilated fundus examination and Scottish diabetic retinopathy grading were done by the ophthalmologist in each team. Participants were classified as having diabetes if they had been diagnosed by a health professional, or if their random blood glucose (RBG) was 200 mg/dL or above on the day of data collection, as measured by a portable glucometer. Ethical approval was obtained from the St John of Jerusalem Eye Hospital Group and the London School of Hygiene & Tropical Medicine ethics committees. Informed oral witnessed consent was obtained from all participants.

**Findings** The survey was conducted between July, 2018, and April, 2019. 4224 individuals were asked to participate, of whom 376 did not, leaving 3848 participants. The number of previously diagnosed and newly diagnosed patients with diabetes was 1176 (486 male, 690 female) and 103 (55 male, 48 female), respectively. The overall prevalence of diabetes across West Bank and Gaza was 33.2% (95% CI 31.5–34.9; 1279 of 3848 participants). The prevalence was higher in women (738 of 2047 [36.1%, 95% CI 33.6–38.5]) than in men (541 of 1801 [30.0%, 27.9–32.2]), and in Gaza Strip (639 [35.8%] of 1783) than in West Bank (640 [31.0%] of 2065;  $p=0.002$ ). Only 539 (46.3%) of 1164 patients with diagnosed diabetes who consented to blood glucose measurement had controlled blood glucose (RBG <200 mg/dL). 483 (41.1%) of 1176 patients with previously diagnosed diabetes had never had an eye check-up or had not been checked in the 2 years before the survey. 327 (25.6%) of 1279 patients with diabetes refused dilated fundus examination; 952 patients did undergo this examination, and 457 (48.0%, 95% CI 43.5–52.6) had diabetic retinopathy or maculopathy. Vision impairment was more common in those with diabetes (428 [33.5%] of 1279) than in those without (652 [25.4%] of 2569). 43 (3.4%) of 1279 participants with diabetes had blindness, compared with 65 (2.5%) of 2569 patients without diabetes. The principal cause of blindness in Gaza Strip was diabetic retinopathy (23 [32.4%] of 71) and in West Bank was untreated cataract (19 [51.4%] of 37). Diabetic retinopathy was the main cause of blindness, severe visual impairment, and moderate visual impairment among patients with diabetes.

**Interpretation** Diabetes and diabetic retinopathy are substantial health problems in Palestine. Earlier detection and proper management at primary health care clinics and by outreach clinics for marginalised populations could be key. Referral networks between health-care sectors and specialised eye centres might provide the necessary infrastructure.

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### Contributors

IM did statistical analysis. NM wrote the Abstract with input from IM. Both authors saw and approved the final version for publication.

### Declaration of interests

We declare no competing interests.

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# The protective role of children's agency: towards critical understanding of agency amongst children living in the context of armed conflict and political violence



Federica Cavazzoni, Ehab Ghafri, Hania Obaid, Guido Veronese, Alec Fiorini, Alaa Jaradah

## Abstract

**Background** In the mainstream literature, children exposed to political violence and armed conflicts are conventionally viewed as a vulnerable group, but we believe their coping abilities, survival skills, and agency are overlooked and underestimated. In this study, we challenged this traditional view by conceptualising agency as children's capacity to act and contribute to their own security, wellbeing, and development, and assessed its contribution in helping them adapt to and cope with challenging and traumatic living conditions.

**Methods** We used a socioecological approach to observe and assess qualitatively children's agency. Participants were recruited by local associations in rural areas, urban areas, and refugee camps in the Gaza Strip and the West Bank. They were chosen by directors and counsellors of education centres through purposive convenience sampling. The inclusion criterion was no diagnosis of physical or psychological disease. All participants and families provided verbal consent before the activities. Each child was asked to draw and describe a map representing all significant places—safe and unsafe—within their neighbourhoods. A subgroup of children was asked to guide the research team within their neighbourhoods using a walkalong technique. All children's narratives were audiotaped, transcribed, and translated by two local bilingual researchers (EG and AJ). Thematic content analysis was applied to written and drawn materials using Atlas.Ti version 8.

**Findings** Data were collected between April and November, 2018. 75 children aged 7–13 years (mean 10·27 [SD 1·38] years, 68% girls, 32% boys, 23% residing in the Gaza Strip and 58% in the West Bank) drew maps. 30 children (17 girls and 13 boys) guided research team members around neighbourhoods. Thematic content analysis revealed six main domains representing children's everyday strategies and practices of agency: 1) actively employing social resource; 2) challenging movement restrictions; 3) receiving an education; 4) personal strategies; 5) reclaiming play spaces; and 6) meaning-making processes and political engagement (appendix). Agency emerged as strictly intersected by experience, societal expectations, gender, geography, and social maturity.

**Interpretation** The domains revealed in this study illustrate the crucial interconnection between children's practices of agency and the multiple ecologies of their everyday life implied in promoting (or suppressing) their ability to mobilise resources to improve their own wellbeing. Children's agency has emerged as a multidimensional construct within the different socioecological levels and thus showing the importance of considering individual family, community, and societal levels when examining life in the context of war. Our findings challenge the picture of Palestinian children as helpless victims, and instead show them to be active agents who mobilise resources within themselves and their social, physical, and political experiences, despite living with violence. The children we assessed were highly competent and active agents who drew on personal, social, and external resources to enhance their wellbeing and life satisfaction and to cope with adversity. Our findings illustrate the importance of agency for children's wellbeing within challenging and traumatic living conditions and how structures, contexts, and relationships can expand or constrain the child's choices and hence, their agency.

**Funding** None.

### Contributors

FC, EG, HO, GV, and AJ did the research and thematic content analysis. EG and AJ translated the children's narratives and AF checked the translations. FC, AF, and GV 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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See Online for appendix

# The validity and reliability of Champion's Health Belief Model Scale for screening breast cancer behaviours in occupied Palestinian territory: a cross-sectional study

Ni'meh Al-Shami, Haya Shojaia, Hiba Darwish

## Abstract

**Background** Breast cancer is the most common cancer in Palestinian women. Breast self-examination and mammography screening are important tools to detect tumours early and improve survival. Champion's Health Belief Model Scale (CHBMS) is a self-report instrument that can help in detecting beliefs and behaviours. This study aimed to assess the validity and reliability of the Arabic version of CHBMS to assess the beliefs and behaviours of Palestinian women in West Bank, occupied Palestinian Territory, towards screening and health education programmes for early detection of breast cancer.

**Methods** The English version of the CHBMS questionnaire was translated into Arabic and revised by two bilingual experts. The questionnaire consisted of sociodemographic questions relating to the following eight subscales: susceptibility to breast cancer (three items), seriousness of breast cancer (seven items), benefits of breast self-examination (six items), barriers to performing examinations (nine items), and confidence in performing examinations (ten items), health motivation (seven items), and benefits of (six items) and barriers to (nine items) performing mammography. A qualitative pilot with ten different women was performed to assess the clarity of the translated CHBMS and its appropriateness to the local context. We then did a cross-sectional study in which all attendees to the main Palestinian Ministry of Health screening clinics in the north, middle, and south of West Bank from Oct 1 to Dec 30, 2016, were asked to be interviewed by telephone. Respondents gave verbal consent to participate. Varimax rotation was used to extract factors with 0.40 loading or greater. The items for breast self-examination and the mammography screening scales were considered separately; 42 items related to breast self-examination were loaded on six subscales and the 15 items related to mammography screening were loaded on two subscales. The internal consistency of each subscale was tested using Cronbach's  $\alpha$  and no increase of more than 0.1 if any item was deleted. All analyses were done with SPSS version 22.

**Results** 444 interviews were completed. The items "if someone developed [breast cancer], she would not live longer than 5 years" and "Doing [breast self-examination] will make me worry" did not meet any subscale loading criterion. The item "I don't feel I can do [breast self-examination] correctly" loaded on the confidence subscale instead of being categorized as a barrier to breast examination. The five items referring to mammography screening benefits and the eight items referring to mammography screening barriers loaded to their respective two subscales. Internal consistency for each breast self-examination subscale was acceptable to high: benefits (Cronbach's  $\alpha=0.931$ ), barriers (0.624) and confidence (0.923), susceptibility (0.941), seriousness (0.786) and health motivation (0.595). The internal consistency for the mammography screening benefits and barriers were good (Cronbach's  $\alpha=0.668$  and 0.640, respectively).

**Interpretation** The study supports the use of CHBMS as a tool with potential to measure beliefs and behaviours related to breast self-examination and mammography screening among Palestinian women. Improved understanding of these factors will lead to development of more effective educational programmes.

**Funding** None.

### Contributors

All authors designed the study and collected the data. NA did the statistical analysis. NA and HS wrote and edited the Abstract. All authors reviewed the final abstract and approved it.

### Declaration of interests

We declare no competing interests.

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# Use of a capture-recapture statistical model to assess morbidity and mortality of road traffic accidents in Gaza Strip: a retrospective study

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## Abstract

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**Background** In low-income and middle-income countries, road traffic injuries (RTIs) are commonly under-reported. In this study I estimated the incidence of RTIs and RTI deaths in Gaza Strip using the capture-recapture method.

**Methods** All data registered on RTIs and RTI deaths from Jan 1 to Dec 31, 2018, were obtained from police records and Palestinian Ministry of Health hospital records. Linked data from these two sources are available through a web-based registry. When possible, records in the two sets of records were linked by an identification number. I used the Chapman formula of capture-recapture to estimate the numbers of RTIs and RTI deaths:  $R = [(R1 + 1)(R2 + 1)/(r + 1)] - 1$ .

**Findings** The Ministry of Health hospital and the traffic police registries included 1722 and 1356 records, respectively. 970 records could be linked. Although the Ministry of Health hospital records reported more RTIs, fewer than the police records contained information about the injury type and vehicle involved (1053 [61%] vs 1302 [96%] and 849 [49%] vs 1139 [84%]), respectively. Most individuals involved in RTIs were men (1313 [76%] in hospital records and 1039 [77%] in police records). 684 (40%) individuals in the hospital records and 516 (38%) in the police records were younger than 15 years and 712 (41%) and 541 (40%), respectively, were in the 15–35-year age group. Most (523 [94%]) of the linked RTIs involved four-wheeled vehicles. The number of RTIs estimated by the Chapman method was 2407 (95% CI 2354–2460), meaning that hospital records captured 72% and police records captured only 56%. The hospital and police records included 16 and 57 deaths, respectively, 14 of which had linked records. Of these deaths, 29 (51%) in the police records and 10 (62%) in the hospital records involved people younger than 15 years, and 45 (79%) and 16 (100%), respectively involved four-wheeled vehicles. The total number of fatalities estimated by the Chapman method was 65 (95% CI 55–74). Therefore, the hospital records captured only 25% whereas police records captured 88%. The population of Gaza Strip in 2018 was 1932843 in 2018. Thus, based on the estimated values, the incidence of RTIs would have been 125 per 100000 population and that for RTI deaths fatalities would have been 3·4 per 100000 population.

**Interpretation** The capture re-capture method has some methodological biases, such as it requires an equal probability of capture between data sources, perfect linkage of data from data sources, and closed populations. However, it might be a powerful tool to improve estimates of the incidence of RTIs and RTI deaths where reporting is incomplete. Neither the Ministry of Health hospital nor the police registry independently provided accurate numbers. Both registries should be strengthened to provide reliable information not only on numbers but also on crash circumstances, injury patterns, road users, vehicles involved, and behavioural risk factors. Reporting of injury cause, manifestation, location, severity, and type could be improved by use of a standardised systems, such as ICD-10 codes.

**Funding** None.

### Contributors

MR did the statistical analysis, interpreted the findings, and wrote the Abstract.

### Declaration of interests

I declare no competing interests.