	Title: Polymerase chain reaction for detection of waterborne bacterial pathogens in potable water in Tubas district-Palestine
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Abstract:

In developing countries, sanitation and hygiene are associated with water quality and contaminations with water borne pathogens. This study was conducted to determine the microbiological quality of potable water in Tubas Governorate. The prevalence of *Total Coliform* (*TC*), *Feacal Coliform* (*FC*), *E.coli, Klebsiella* and *Salmonella* contamination were assessed in 60 water samples collected from 6 groundwater wells, 15 network distribution systems, 9 tankers, 15 tanks (homes, school and restaurants) and 15 rain fed cisterns in Tubas Governorate, by using polymerase chain reaction (PCR) technique. The results showed that 40% and 31.6% of water samples were generally exceeding the Palestinian and WHO standard for *TC* which is (3 CFU/100ml) and *FC* which is (0 CFU/100ml) for potable water. Results showed that the prevalence of *E. coli, Klebsiella* and *Salmonella* was 31.67%, 18.33% and 10% respectively. It was found that the water samples collected from rain fed cisterns had the maximal proportion of risk compared with other water resources, as they constitutes 15% for *TC* and 13.33% for *FC*. Specifically collected water samples from rain fed cisterns contained 53.3% of *E. coli*, 40% of *Klebsiella* and 20% of *Salmonella* contaminants; meanwhile the samples taken from the groundwater wells and networks almost free from *FC*. On the other hand, these samples that were taken from groundwater wells and networks were found slightly contaminated with *TC* (1.67%) making them less risky referring to Palestinian and WHO guideline.

The study revealed poor bacteriological quality of drinking water sources, which may be due to several reasons such as leakage from pits for rain fed cisterns or transporting tankers. The study recommended increasing the health surveillance on the rain fed cisterns and transporting tankers in Tubas Governorate and monitoring the quantity of chlorine used for disinfection (0.8-1 mg/L). In addition to that, increase the education regarding waterborne diseases in collaboration with the Ministry of Health and the Palestinian Water Authority (PWA). The study also recommended the application of the Polymerase Chain Reaction (PCR) technique for routine test in Palestinian water laboratories due to its accuracy for detection of the pathogens with high sensitivity and efficiency.