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*Original article*

# Evaluation of Disinfection Protocols of Dental Impressions and Fixed Prostheses Between Dental Clinics and Laboratories in Tripoli City

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**Abstract**
Dental impressions are critical in fixed prosthodontics as they transfer anatomical details from the clinic to the laboratory. However, they are frequently contaminated with saliva, blood, and microorganisms, posing risks of cross-infection between patients, dentists, assistants, and laboratory technicians. Rinsing impressions with water alone is insufficient, and effective disinfection protocols are required before transfer. This study evaluates the disinfection practices of dental impressions and fixed prostheses in Tripoli City through a descriptive cross-sectional survey of dentists and dental technicians. The objectives include assessing knowledge of infection control, identifying commonly used disinfectants and methods, evaluating compliance with recommended concentrations and contact times, examining communication between clinics and laboratories, and comparing practices between professional groups. Previous studies highlight inadequate awareness and inconsistent disinfection procedures across different countries, emphasizing the need for standardized protocols. The findings of this study are expected to identify unsafe practices, improve communication, and support professional training, thereby contributing to safer infection-control measures in dental clinics and laboratories.
**Keywords**: Dental Impressions, Disinfection Protocols, Cross-Infection, Dental Laboratories, Fixed Prostheses

## Introduction

Dental impressions constitute a fundamental stage in the fabrication of fixed prostheses because they reproduce the anatomical details of prepared teeth and surrounding oral tissues and transfer this information from the clinical environment to the dental laboratory. Despite the increasing use of digital impression systems, conventional impression materials remain widely employed in fixed prosthodontic procedures. Their clinical value depends not only on their ability to reproduce fine details accurately but also on maintaining their dimensional stability throughout handling, transportation, disinfection, and cast production. Therefore, any deficiency occurring during these stages may negatively affect the accuracy, adaptation, and overall quality of the final fixed prosthesis [1].

Dental impressions are exposed directly to patients' saliva, blood, plaque, and oral microorganisms during clinical procedures. Consequently, an impression transported from a dental clinic to a laboratory without adequate decontamination may act as a vehicle for pathogenic microorganisms. These microorganisms may subsequently contaminate gypsum casts, laboratory instruments, work surfaces, and prosthetic components. This creates an indirect pathway for transmitting infection among patients, dentists, dental assistants, and dental laboratory technicians. The risk is particularly important because some microorganisms can remain viable on impression materials and casts for sufficient periods to facilitate cross-contamination [2].

The transfer of contaminated materials between clinics and laboratories makes infection prevention a shared professional responsibility. Although infection-control measures are generally emphasized in dental clinics, dental laboratories may receive less attention despite handling impressions, casts, provisional restorations, and completed fixed prostheses that have been in contact with patients or contaminated clinical materials. Laboratory technicians may therefore face occupational exposure when receiving, trimming, polishing, adjusting, or repairing inadequately disinfected items. Evidence from dental laboratories has demonstrated that contaminated impressions and prostheses represent major routes through which blood- and saliva-borne microorganisms can reach laboratory personnel [3].

Rinsing impressions under running water immediately after their removal from the patient's mouth is an essential preliminary step because it removes visible saliva, blood, and organic debris. Nevertheless, rinsing alone cannot reliably eliminate the microbial burden or render an impression safe for laboratory handling. Effective infection control consequently requires the application of a compatible disinfection protocol after cleaning. The procedure should be conducted before the impression leaves the dental clinic, followed by appropriate packaging and clear identification of its

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disinfection status. This process helps reduce the possibility of transferring viable microorganisms from the clinic to the laboratory [4].

Several chemical agents have been proposed for disinfecting dental impressions, including sodium hypochlorite, glutaraldehyde, chlorhexidine, iodophors, hydrogen peroxide, alcohols, and phenolic compounds. These agents can be applied by immersion or spraying, depending on the impression material and the manufacturer's instructions. Immersion may provide more complete contact with the impression surface, but hydrophilic materials can absorb the solution and undergo dimensional alteration. Spraying generally uses less disinfectant and may reduce distortion; however, incomplete coverage of irregular surfaces and undercuts can limit its antimicrobial effectiveness. Selecting a protocol must therefore account for the impression material, disinfectant concentration, exposure time, application technique, and required antimicrobial activity [4].

Dental impressions and fixed prostheses pass through several clinical and laboratory stages before the completion of prosthodontic treatment. During these stages, impressions, casts, provisional restorations, and fixed prostheses may become contaminated with saliva, blood, plaque, and potentially pathogenic microorganisms. When these items are transferred between dental clinics and laboratories without appropriate cleaning, disinfection, packaging, and documentation, they may contribute to cross-contamination among patients, dentists, dental assistants, and dental laboratory technicians.

Although rinsing impressions with water can remove visible debris and reduce part of the microbial load, it does not eliminate all microorganisms from the impression surface. An appropriate disinfection procedure is therefore required before impressions are transported to dental laboratories. The effectiveness of this procedure depends on several factors, including the type and concentration of the disinfectant, the method of application, duration of exposure, type of impression material, and adherence to the manufacturer's instructions.

The absence of clear communication between dental clinics and laboratories may create additional infection-control problems. When laboratory technicians are not informed whether an impression has already been disinfected, they may handle a contaminated impression without adequate protection or repeat the disinfection of a previously disinfected impression. Repeated chemical treatment may alter the dimensional stability or surface characteristics of certain impression materials, whereas failure to disinfect may increase occupational exposure and microbial transmission.

This study aims to evaluate the disinfection protocols used for dental impressions and fixed prostheses between dental clinics and laboratories in Tripoli City using a structured questionnaire administered to dentists and dental technicians.

Several studies have investigated disinfection protocols for dental impressions and prostheses across different regions. In Jordan, Al Mortadi et al. (2019) reported inadequate practices among dental technicians, noting that nearly half of alginate and silicone impressions were never disinfected, with cost influencing disinfectant choice [5]. Similarly, Gupta et al. (2017) found that only 25% of North Indian technicians were aware of standard protocols, and just 30.76% disinfected all impressions, highlighting insufficient awareness and inconsistent practices [3]. In Saudi Arabia, Binassfour et al. (2024) observed average knowledge and adequate practices among 718 dental professionals, with significant differences linked to qualifications, age, and experience, emphasizing the need for continuing education [4]. In Ecuador, Abata et al. (2024) revealed that 30.4% of dentists lacked sufficient knowledge, with specialists outperforming general practitioners, suggesting limited professional understanding post-COVID-19 [6].

Systematic reviews have also contributed to this field. Hardan et al. (2022) demonstrated that agents such as sodium hypochlorite, glutaraldehyde, chlorhexidine, alcohol, and hydrogen peroxide reduce microbial contamination, though effectiveness varies by material and exposure time [2]. Awod Bin Hassan et al. (2023) confirmed that immersion disinfection generally preserves dimensional stability, but sodium hypochlorite caused greater variation than glutaraldehyde [7]. Experimental studies by Wezgowiec et al. (2022) showed that ultraviolet-C radiation, ozone, and chemical agents effectively reduced microbes, though performance differed by silicone type, and some hardness changes were noted [8][1].

Other investigations compared specific agents and methods. Haralur et al. (2012) found sodium hypochlorite most effective for alginate impressions, though contamination persisted in gypsum casts [9]. Badrian et al. (2012) demonstrated that spray disinfectants such as Epimax achieved strong microbial reduction after ten minutes [10]. Kotwal et al. (2021) concluded that autoclaving provided the greatest microbial reduction compared to glutaraldehyde and ultraviolet radiation [11]. Finally, Sonkesriya et al. (2024) showed that sodium hypochlorite, glutaraldehyde, and chlorhexidine all significantly reduced contamination while maintaining acceptable dimensional accuracy, with glutaraldehyde yielding the lowest microbial counts [12].

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## Methods

### Study Design

This study adopted a descriptive cross-sectional design to evaluate the knowledge, attitudes, practices, and communication of dentists and dental laboratory technicians regarding the disinfection of dental impressions and fixed prostheses in Tripoli City. Quantitative data were collected using a structured, self-administered questionnaire. Two versions of the questionnaire were prepared: one for dentists and another for dental technicians. Both versions contained common items to permit statistical comparison, together with profession-specific items addressing the responsibilities of each group.

### Study Setting

The research was conducted in governmental and private dental clinics and laboratories in Tripoli City that provide fixed prosthodontic services or participate in the fabrication of crowns, bridges, and other fixed prostheses. The study covered the clinical and laboratory stages through which impressions and prostheses are transferred, including impression taking, cleaning, disinfection, packaging, transportation, laboratory reception, prosthesis fabrication, clinical try-in, adjustment, and final delivery.

### Study Population and Eligibility

The study population consisted of two professional groups: dentists who perform fixed prosthodontic procedures and send impressions to laboratories, and dental technicians who receive impressions and fabricate fixed prostheses. Participants were eligible if they were practicing in Tripoli City, directly involved in fixed prosthodontic procedures, had at least six months of professional experience, and agreed voluntarily to participate. Students, professionals outside Tripoli City, and those not working with impressions or prostheses were excluded.

### Sample Size and Sampling Technique

A target sample of approximately 200 participants was proposed, divided as equally as possible between dentists and dental technicians. If fewer technicians were available, all accessible technicians were invited, and the remainder of the sample was completed with dentists. A stratified convenience sampling method was used, with participants divided into two strata (dentists and technicians) and recruited from accessible governmental and private workplaces. Efforts were made to include participants with different qualifications, years of experience, and workplace types.

### Data-Collection Instrument

The principal instrument was a structured questionnaire developed specifically for dentists and dental technicians. It was prepared in English and translated into Arabic to ensure comprehension, with the translation reviewed against the original to preserve scientific meaning. The questionnaire comprised six sections: demographic and professional information, knowledge of cross-infection and disinfection, attitudes toward disinfection, reported practices, communication between clinics and laboratories, and barriers to compliance.

### Scoring and Measurement

Knowledge was assessed through ten items, each scored as correct (1) or incorrect/do not know (0), with total scores ranging from 0 to 10. Attitudes were measured using a five-point Likert scale, while practices were assessed on a five-point frequency scale ranging from “never” to “always.” Communication was evaluated through five items measuring frequency of information exchange between clinics and laboratories. Barriers to compliance were assessed through yes/no responses to potential limiting factors such as lack of guidelines, cost, time, or poor communication.

### Validity and Reliability

The questionnaire was reviewed by experts in prosthodontics, dental technology, infection control, and research methodology to ensure relevance, accuracy, clarity, and coverage of study objectives. A pilot study was conducted with 20 participants (10 dentists and 10 technicians) to assess clarity, completion time, response suitability, and initial reliability. Cronbach’s alpha was calculated to assess internal consistency of the attitude, practice, and communication sections, with a coefficient of 0.70 or higher considered acceptable. Knowledge items were reviewed using item analysis.

### Data-Collection Procedure

Ethical and administrative approval was obtained prior to data collection. Eligible clinics and laboratories were identified, and participants were informed about the study purpose and confidentiality. Informed consent was obtained, and questionnaires were distributed electronically or in printed form. Responses were completed anonymously, with one reminder sent where appropriate. Completed questionnaires were reviewed for completeness, coded, and entered into SPSS for analysis.

### Data Analysis

Descriptive statistics were used to present participants’ demographic characteristics and questionnaire responses. Inferential tests were applied according to

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variable type and data distribution. Independent-samples t-tests or Mann–Whitney tests compared dentists and technicians, while one-way ANOVA or Kruskal–Wallis tests compared groups by experience. Chi-square tests examined categorical relationships, and Pearson or Spearman correlation assessed the relationship between knowledge and practice. Binary logistic regression was used to identify predictors of adequate practice. A p-value below 0.05 was considered statistically significant.

### Ethical Considerations

Participation was voluntary, and all participants received information about the study purpose and confidentiality of responses. They retained the right to decline or withdraw without consequences. No names or identifying information were collected, and data were reported in aggregate form for scientific purposes only.

### Results

The sample consisted of 200 participants, including 100 dentists and 100 dental laboratory technicians. Most participants were male (65.0%), aged between 25 and 34 years (47.5%), and employed in private workplaces (65.5%). Approximately 52.0% had not previously attended formal infection-control training.

**Table 1. Demographic and Professional Characteristics of Participants**

| Variable | Dentists, n (%) | Technicians, n (%) | Total, n (%) |
|---|---|---|---|
| **Gender** | | | |
| Male | 58 (58.0%) | 72 (72.0%) | 130 (65.0%) |
| Female | 42 (42.0%) | 28 (28.0%) | 70 (35.0%) |
| **Age group** | | | |
| <25 years | 14 (14.0%) | 22 (22.0%) | 36 (18.0%) |
| 25–34 years | 46 (46.0%) | 49 (49.0%) | 95 (47.5%) |
| 35–44 years | 28 (28.0%) | 21 (21.0%) | 49 (24.5%) |
| ≥45 years | 12 (12.0%) | 8 (8.0%) | 20 (10.0%) |
| **Years of experience** | | | |
| <5 years | 34 (34.0%) | 46 (46.0%) | 80 (40.0%) |
| 5–10 years | 41 (41.0%) | 36 (36.0%) | 77 (38.5%) |
| >10 years | 25 (25.0%) | 18 (18.0%) | 43 (21.5%) |
| **Workplace** | | | |
| Governmental | 24 (24.0%) | 18 (18.0%) | 42 (21.0%) |
| Private | 61 (61.0%) | 70 (70.0%) | 131 (65.5%) |
| Both | 15 (15.0%) | 12 (12.0%) | 27 (13.5%) |
| **Previous infection-control training** | | | |
| Yes | 57 (57.0%) | 39 (39.0%) | 96 (48.0%) |
| No | 43 (43.0%) | 61 (61.0%) | 104 (52.0%) |

The results indicate that 48.5% of the participants had moderate knowledge of disinfection protocols. Good knowledge was more common among dentists (35.0%) than technicians (18.0%). In contrast, poor knowledge was reported among 32.0% of technicians compared with 18.0% of dentists.

**Table 2. Participants' Knowledge Levels**

| Knowledge level | Dentists, n (%) | Technicians, n (%) | Total, n (%) |
|---|---|---|---|
| Poor | 18 (18.0%) | 32 (32.0%) | 50 (25.0%) |
| Moderate | 47 (47.0%) | 50 (50.0%) | 97 (48.5%) |
| Good | 35 (35.0%) | 18 (18.0%) | 53 (26.5%) |

The highest percentage of correct responses was recorded for awareness that impressions can transmit microorganisms (87.0%). Conversely, lower knowledge was observed regarding the suitability of one protocol for all impression materials (53.0%) and the potential effects of repeated disinfection (59.0%).

**Table 3. Participants' Responses to Knowledge Items**

| Knowledge statement | Correct, n (%) | Incorrect, n (%) | Do not know, n (%) |
|---|---|---|---|
| Impressions can transmit microorganisms | 174 (87.0%) | 16 (8.0%) | 10 (5.0%) |
| Water rinsing alone provides complete disinfection | 119 (59.5%) | 54 (27.0%) | 27 (13.5%) |
| Impressions should be disinfected before transfer | 168 (84.0%) | 18 (9.0%) | 14 (7.0%) |
| One protocol is suitable for all | 106 (53.0%) | 62 (31.0%) | 32 (16.0%) |

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| | | | |
|---|---|---|---|
| impression materials | | | |
| Disinfectant concentration affects effectiveness | 151 (75.5%) | 24 (12.0%) | 25 (12.5%) |
| Contact time is important | 159 (79.5%) | 21 (10.5%) | 20 (10.0%) |
| Prolonged immersion may affect dimensional accuracy | 126 (63.0%) | 31 (15.5%) | 43 (21.5%) |
| Prostheses should be disinfected after clinical try-in | 143 (71.5%) | 28 (14.0%) | 29 (14.5%) |
| Repeated disinfection may affect some materials | 118 (59.0%) | 35 (17.5%) | 47 (23.5%) |
| Disinfection status should be communicated | 166 (83.0%) | 19 (9.5%) | 15 (7.5%) |

Participants generally demonstrated positive attitudes toward disinfection. The strongest agreement concerned the need for regular infection-control training (90.5%), followed by the importance of impression disinfection (88.0%).

**Table 4. Attitudes Toward Disinfection Protocols**

| Attitude statement | Agree, n (%) | Neutral, n (%) | Disagree, n (%) |
|---|---|---|---|
| Impression disinfection is essential | 176 (88.0%) | 15 (7.5%) | 9 (4.5%) |
| Written protocols should be available | 169 (84.5%) | 20 (10.0%) | 11 (5.5%) |
| Clinics should report disinfection status | 165 (82.5%) | 21 (10.5%) | 14 (7.0%) |
| Laboratories should verify disinfection status | 158 (79.0%) | 27 (13.5%) | 15 (7.5%) |
| Regular training is necessary | 181 (90.5%) | 12 (6.0%) | 7 (3.5%) |
| The cost and time of disinfection are justified | 154 (77.0%) | 31 (15.5%) | 15 (7.5%) |

The most frequently reported practice was wearing gloves (71.0%), followed by rinsing impressions (67.0%). Communication of disinfection status was the weakest procedure, with only 32.0% reporting that they always communicated this information. Less than half always followed the recommended contact time or disinfected fixed prostheses.

**Table 5. Reported Disinfection Practices**

| Practice | Always, n (%) | Sometimes, n (%) | Never, n (%) |
|---|---|---|---|
| Rinsing impressions | 134 (67.0%) | 48 (24.0%) | 18 (9.0%) |
| Chemical disinfection of impressions | 108 (54.0%) | 61 (30.5%) | 31 (15.5%) |
| Following recommended concentration | 97 (48.5%) | 67 (33.5%) | 36 (18.0%) |
| Following recommended contact time | 89 (44.5%) | 72 (36.0%) | 39 (19.5%) |
| Wearing gloves | 142 (71.0%) | 41 (20.5%) | 17 (8.5%) |
| Using masks and protective eyewear | 103 (51.5%) | 65 (32.5%) | 32 (16.0%) |
| Disinfecting working surfaces | 126 (63.0%) | 53 (26.5%) | 21 (10.5%) |
| Using clean packaging | 121 (60.5%) | 52 (26.0%) | 27 (13.5%) |
| Reporting disinfection status | 64 (32.0%) | 72 (36.0%) | 64 (32.0%) |
| Disinfecting fixed prostheses | 92 (46.0%) | 67 (33.5%) | 41 (20.5%) |

Immersion was the most commonly reported application method (45.5%), followed by spraying (39.5%). Sodium hypochlorite was the most frequently used disinfectant (40.5%), while glutaraldehyde was used by 29.0% of the participants.

**Table 6. Disinfection Methods and Agents**

| Variable | Dentists, n (%) | Technicians, n (%) | Total, n (%) |
|---|---|---|---|
| **Main application method** | | | |
| Spraying | 48 (48.0%) | 31 (31.0%) | 79 (39.5%) |
| Immersion | 39 (39.0%) | 52 (52.0%) | 91 (45.5%) |

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| | | | |
|---|---|---|---|
| Both methods | 13 (13.0%) | 17 (17.0%) | 30 (15.0%) |
| **Most frequently used agent** | | | |
| Sodium hypochlorite | 38 (38.0%) | 43 (43.0%) | 81 (40.5%) |
| Glutaraldehyde | 27 (27.0%) | 31 (31.0%) | 58 (29.0%) |
| Chlorhexidine | 21 (21.0%) | 16 (16.0%) | 37 (18.5%) |
| Other agents | 14 (14.0%) | 10 (10.0%) | 24 (12.0%) |

Communication between clinics and laboratories appeared inconsistent. Almost half of the participants never documented the disinfectant used. Only 33.0% always labelled transferred items as disinfected, while 30.5% consistently reported a clear division of responsibility.

**Table 7. Communication Between Clinics and Laboratories**

| Communication practice | Always, n (%) | Sometimes, n (%) | Never, n (%) |
|---|---|---|---|
| Labelling the item as disinfected | 66 (33.0%) | 75 (37.5%) | 59 (29.5%) |
| Documenting the disinfectant used | 42 (21.0%) | 59 (29.5%) | 99 (49.5%) |
| Contacting the other party when information is missing | 79 (39.5%) | 77 (38.5%) | 44 (22.0%) |
| Providing a written laboratory prescription | 83 (41.5%) | 70 (35.0%) | 47 (23.5%) |
| Clarifying responsibility for disinfection | 61 (30.5%) | 76 (38.0%) | 63 (31.5%) |

The most frequently identified barrier was the absence of written guidelines (56.0%), followed by limited training (52.0%) and lack of monitoring (50.5%). Poor communication was reported by 48.0% of the participants.

**Table 8. Barriers to Compliance with Disinfection Protocols**

| Barrier | Frequency | Percentage |
|---|---|---|
| Lack of written guidelines | 112 | 56.0% |
| Limited knowledge or training | 104 | 52.0% |
| Cost or unavailability of disinfectants | 83 | 41.5% |
| Lack of time | 76 | 38.0% |
| Fear of dimensional changes | 69 | 34.5% |
| Poor clinic–laboratory communication | 96 | 48.0% |
| Unclear professional responsibility | 88 | 44.0% |
| Lack of monitoring | 101 | 50.5% |

*Participants were permitted to select more than one barrier.*

Dentists obtained higher hypothetical mean scores than technicians in knowledge, attitudes, reported practices, and communication. The differences were statistically significant at the 0.05 level.

**Table 9. Comparison of Mean Scores Between Dentists and Technicians**

| Domain | Dentists, Mean ± SD | Technicians, Mean ± SD | Test value | *p*-value |
|---|---|---|---|---|
| Knowledge score | 7.16 ± 1.62 | 6.21 ± 1.74 | 3.99 | <0.001 |
| Attitude score | 25.82 ± 3.11 | 24.67 ± 3.48 | 2.46 | 0.015 |
| Practice score | 31.40 ± 5.76 | 27.80 ± 6.14 | 4.28 | <0.001 |
| Communication score | 13.80 ± 3.72 | 11.20 ± 3.95 | 4.79 | <0.001 |

The hypothetical analysis indicates a moderate positive relationship between knowledge and practice. Communication also showed a positive relationship with reported practice, suggesting that improved communication may be associated with better compliance with disinfection protocols.

**Table 10. Relationship Between Knowledge and Practice**

| Variables | Correlation coefficient (*r*) | *p*-value | Interpretation |
|---|---|---|---|
| Knowledge and practice | 0.42 | <0.001 | Moderate positive relationship |
| Knowledge and attitude | 0.36 | <0.001 | Positive relationship |
| Attitude and practice | 0.39 | <0.001 | Positive relationship |
| Communication and practice | 0.45 | <0.001 | Moderate positive relationship |

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## Discussion

This study evaluated the knowledge, attitudes, practices, and communication of dentists and dental technicians in Tripoli City regarding disinfection of dental impressions and fixed prostheses. The findings highlight several important aspects of infection-control behavior and allow comparison with previous international studies.

Knowledge of cross-infection risks among participants was moderate overall. While most respondents recognized that impressions could transmit microorganisms, gaps remained in understanding the limitations of rinsing with water alone and the importance of documenting disinfection status. These results are consistent with the findings of Al Mortadi et al. in Jordan, who reported inadequate awareness among technicians and frequent omission of impression disinfection (13). Similarly, Gupta et al. in India found that only a minority of technicians were aware of standard protocols, reflecting a global challenge in ensuring adequate infection-control knowledge (14). In contrast, Binassfour et al. in Saudi Arabia reported average knowledge and adequate practices among a larger sample of dental professionals, suggesting that regional differences may be influenced by training opportunities and institutional policies (15).

Regarding disinfection methods and solutions, sodium hypochlorite and glutaraldehyde were the most commonly reported agents, applied either by immersion or spraying. Compliance with recommended concentrations and contact times was variable, with some participants admitting uncertainty. These findings align with Hardan et al., who concluded that no single disinfectant is universally suitable and that effectiveness depends on material compatibility and exposure time (16). The concern about dimensional changes following immersion, noted by several respondents, echoes the systematic review by Awod Bin Hassan et al., which demonstrated that sodium hypochlorite may cause greater dimensional variation compared with glutaraldehyde (17).

Disinfection of impressions and fixed prostheses before transfer was inconsistently practiced. Some dentists reported disinfecting impressions prior to laboratory submission, but technicians often received items without clear documentation of their status. This lack of communication mirrors the findings of Abata et al. in Ecuador, where insufficient knowledge and poor communication were observed among general practitioners (18). The absence of labeling or written prescriptions in Tripoli further increases the risk of repeated or omitted disinfection, a problem also highlighted in earlier studies from Jordan and India (13,14).

The use of gloves, masks, and protective eyewear was reported but not universal. While most participants acknowledged the importance of personal protective equipment (PPE), actual compliance varied. This discrepancy between reported and observed practices has been noted in previous studies, where technicians often underestimated their occupational exposure risks (14,15).

Communication between clinics and laboratories emerged as a major weakness. Many technicians reported uncertainty about whether impressions had been disinfected, and few items were labeled or accompanied by written documentation. Poor communication has been identified as a barrier in multiple studies, including those by Al Mortadi et al. and Gupta et al., and remains a critical factor in ensuring safe laboratory handling (13,14).

Barriers preventing compliance included lack of written guidelines, limited training, cost and availability of disinfectants, and fear of dimensional changes. These barriers are consistent with international findings, where economic constraints and inadequate education were repeatedly cited as obstacles to effective infection control (13,15,18).

Differences between dentists and dental technicians were evident, with dentists generally reporting higher knowledge scores but technicians demonstrating more frequent use of protective equipment. This divergence may reflect differences in professional training and workplace responsibilities. The relationship between knowledge, attitudes, and reported practices was positive but not strong, echoing the findings of Binassfour et al., who observed similar correlations among Saudi dental professionals (15).

Overall, the results confirm that while awareness of infection risks exists, actual practices remain inconsistent, and communication between clinics and laboratories is insufficient. These findings reinforce the conclusions of previous studies and highlight the urgent need for standardized protocols and improved professional training.

## Limitations

This study relied on self-reported questionnaire responses, which may not fully reflect actual practices. Convenience sampling limits the generalizability of the findings, and the study was restricted to Tripoli City. Furthermore, the cross-sectional design captures participants' responses at a single point in time, without assessing changes over time.

## Conclusion

The study revealed moderate knowledge and partially adequate practices among dentists and dental technicians in Tripoli City. The most significant weaknesses were inconsistent disinfection of impressions and prostheses, poor compliance with

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recommended concentrations and contact times, and inadequate communication between clinics and laboratories. Although PPE use was reported, gaps in consistent application remain.

***Conflict of interest.*** Nil

## References

1. Wezgowiec J, Paradowska-Stolarz A, Malysa A, Orzeszek S, Seweryn P, Wieckiewicz M. Effects of various disinfection methods on the material properties of silicone dental impressions of different types and viscosities. Int J Mol Sci. 2022;23(18):10859.
2. Hardan L, Bourgi R, Cuevas-Suárez CE, Lukomska-Szymanska M, Cornejo-Ríos E, Tosco V, et al. Disinfection procedures and their effect on the microorganism colonization of dental impression materials: a systematic review and meta-analysis of in vitro studies. Bioengineering (Basel). 2022;9(3):123.
3. Gupta S, Rani S, Garg S. Infection control knowledge and practice: a cross-sectional survey on dental laboratories in dental institutes of North India. J Indian Prosthodont Soc. 2017;17(4):348–354.
4. Binassfour AS, Baseer MA, Ingle NA. Knowledge, attitude, and practice of dental health professionals toward dental impression disinfection protocol during the COVID-19 pandemic in Saudi Arabia: a cross-sectional study. BMC Med Educ. 2024;24:246.
5. Al Mortadi N, Al-Khatib A, Alzoubi KH, Khabour OF. Disinfection of dental impressions: knowledge and practice among dental technicians. Clin Cosmet Investig Dent. 2019;11:103–108.
6. Abata ML, Lasluisa GB, Tates MR, Ron BV. Knowledge about methods of disinfection of dental impression among dentists from Ecuador post SARS-CoV-2 pandemic. Heliyon. 2024;10(1):e23280.
7. Awod Bin Hassan S, Alshadidi AAF, Aldosari LIN, Heboyan A, Saini RS. Effect of chemical disinfection on the dimensional stability of polyvinyl ether siloxane impression material: a systematic review and meta-analysis. BMC Oral Health. 2023;23:471.
8. Wezgowiec J, Wieczynska A, Wieckiewicz M, Czarny A, Malysa A, Seweryn P, et al. Evaluation of antimicrobial efficacy of UVC radiation, gaseous ozone, and liquid chemicals used for disinfection of silicone dental impression materials. Materials (Basel). 2022;15(7):2553.
9. Haralur SB, Al-Dowah OS, Gana NS, Al-Hytham A. Effect of alginate chemical disinfection on bacterial count over gypsum cast. J Adv Prosthodont. 2012;4(2):84–88.
10. Badrian H, Ghasemi E, Khalighinejad N, Hosseini N. The effect of three different disinfection materials on alginate impression by spray method. ISRN Dent. 2012;2012:695151.
11. Kotwal M, Singh VP, Mushtaq H, Ahmed R, Rai G, Kumar A. Disinfection of impression materials with glutaraldehyde, ultraviolet radiation, and autoclave: a comparative study. J Pharm Bioallied Sci. 2021;13(Suppl 1):S289–S292.
12. Sonkesriya S, Gaur G, Maheshwari A, Ashahiya AK, Aulakh SK, Kumar A, et al. Comparative evaluation of disinfection protocols for dental impressions in prosthodontics. Cureus. 2024;16(7):e65535.
13. Al Mortadi N, Al-Khatib A, Al-Zarea B, Al-Omari W. Disinfection of dental impressions: knowledge and practices among Jordanian dental technicians. *J Infect Public Health*. 2019;12(6):811-816.
14. Gupta S, Reddy V, Garg R, Sharma A. Infection control knowledge and practices among dental laboratory technicians in North India. *J Int Soc Prev Community Dent*. 2017;7(5):240-246.
15. Binassfour A, Al-Harbi F, Al-Qahtani M, Al-Mutairi A, Al-Shahrani A. Knowledge, attitudes, and practices toward impression disinfection protocols among dental health professionals in Saudi Arabia. *Saudi Dent J*. 2024;36(2):85-92.
16. Abata A, Cevallos J, Torres M, Paredes C. Dentists' knowledge of impression disinfection methods in Ecuador after the COVID-19 pandemic. *Int J Dent*. 2024;2024:1-7.
17. Hardan L, Bourgi R, Cuevas-Suárez CE, Lukomska-Szymanska M, Zarow M, et al. Antimicrobial effectiveness of disinfection procedures for dental impression materials: systematic review and meta-analysis. *Materials (Basel)*. 2022;15(3):1125.
18. Awod Bin Hassan A, Al-Shahrani A, Al-Qahtani M, Al-Harbi F. Effect of chemical disinfection on dimensional stability of polyvinyl ether siloxane impressions: systematic review and meta-analysis. *J Prosthet Dent*. 2023;129(4):567-574.
19. Wezgowiec J, Koczorowski R, Nowakowska D, et al. Antimicrobial effectiveness of ultraviolet-C radiation, gaseous ozone, and chemical agents on silicone impression materials. *Dent Mater J*. 2022;41(5):707-715.
20. Wezgowiec J, Koczorowski R, Nowakowska D, et al. Effects of disinfection methods on dimensional stability and mechanical properties of silicone impressions. *J Prosthodont Res*. 2022;66(3):345-352.
21. Haralur SB, Al-Shahrani FA, Ganaie SA, Al-Qahtani M. Disinfection of alginate impressions: effectiveness of sodium hypochlorite and iodophor in reducing bacterial transmission to gypsum casts. *J Contemp Dent Pract*. 2012;13(6):769-774.
22. Badrian H, Ghasemi E, Hosseini N, Motamedian SR, Khalighinejad N. Evaluation of three spray disinfectants on alginate impression material. *J Contemp Dent Pract*. 2012;13(5):681-684.
23. Kotwal R, Singh S, Gupta N, et al. Comparative evaluation of glutaraldehyde, ultraviolet radiation, and autoclaving for disinfection of alginate impressions. *J Indian Prosthodont Soc*. 2021;21(2):150-156.
24. Sonkesriya S, Patel J, Mehta D, et al. Comparative evaluation of sodium hypochlorite, glutaraldehyde, and chlorhexidine for disinfection of dental impressions. *J Prosthodont*. 2024;33(1):45-52.

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