# Correlates of Oral Health Integration into Primary Healthcare among Non-Oral Health Care Workers in Imenti North District, Kenya

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## Abstract

**INTRODUCTION**

**Integration of oral health into primary health care is key to improving equality in oral health care, especially in resource-constrained setups. The success is pegged on contextual strategies that empower the majority of non-oral healthcare workers in the primary healthcare system. To achieve this, there is a need to establish current integration practices and potential correlates. The objective of the study was to determine oral health care knowledge, attitude and services provision, and associated correlates among non-oral health care workers in Imenti North district, Kenya**

**METHODS**

**This was a cross-sectional study carried out in Imenti North district, Meru County, Kenya among 214 doctors, clinical officers and nurses. A pre-tested self-administered questionnaire was used to collect data among the participants. Data was analyzed using SPSS version 17. *Chi*-square was used to test for significance.**

**RESULTS**

**The majority (88%) of the respondents had adequate knowledge of oral health. Knowledge was statistically influenced by the level of training, having a dental clinic within the facility and oral health training. A positive attitude (>90%) was exhibited towards all oral health-related actions assessed. Oral health services provided by the participants included oral health education (65.4%), prescriptions (33.6%) and referrals (95.3%). Only 12% did oral screening for all their patients. Screening was significantly influenced by training in oral health and the availability of treatment and referral guidelines.**

**CONCLUSION AND RECOMMENDATION**

**The majority of the doctors, nurses and clinical officers have adequate knowledge and positive attitudes towards oral health. Oral health services integration into their services is however poor. Efforts should be made to provide practical oral health training to doctors, nurses and clinical officers at both pre-clinical and in-service stages.**

***Keywords:*** *Integration, Oral Health, Primary Health Care, Non-Oral Health Care Workers*

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## Introduction

Integration of oral health into primary health care (PHC) has remained a constant goal in the sub-Saharan Africa region since the inaugural resolution in the 1980s[1]. The aim is to tap into the gains made in the implementation of PHC, especially the expansive network of health facilities and the corresponding growing number of PHC healthcare workers [1]. Integration has however remained elusive as oral health care delivery in the region remained largely vertical[2] and the majority of PHC worker, who are non-oral health, have been poorly prepared to integrate oral health into their services.

Among the factors opined to influence non-oral health care workers' provision of oral health care are their social demographic variables, their knowledge and their attitude towards oral health[3–7]. Others related to the

healthcare system are; the availability of enabling infrastructure and commodities, availability of guidelines on oral healthcare provision, training in oral health, and availability of dental clinics to refer [3,8,9].

Kenya has an expansive healthcare system with different non-oral healthcare workers across the spectrum of healthcare delivery as defined by the Kenya Expanded Package of Health (KEPH)[10]. They include doctors, clinical officers and nurses. Oral health services provision and factors influencing the decision to integrate oral health into their services are however poorly documented. Thus, the formulation of policies and strategies targeting oral health provision among these important actors in the integration process remains opaque. Their clients inadvertently miss out on the benefits of an integrated approach to oral health care.

This study aimed to therefore determine knowledge, attitude and oral health care services provision by the different non-oral health cadres and the correlates therefrom. The goal is to inform the policymakers on the enablers and barriers of integration to enable them to make informed decisions when suggesting ways of improving the integration of oral health services into primary health care.

## Materials and methods

This was a cross-sectional study carried out in the Imenti North district of Meru County. The district has 22 health facilities at all KEPH levels. Doctors were only found in level 4 and 5 hospitals. Clinical officers were found in level 3,4 and 5 health facilities. Nurses provided services across the KEPH levels. The sample size was calculated using Fisher's formula {n= Z 2 × p (1p)/d 2} using a confidence level (Z) of 95% (1.96), standard deviation (p) of 0.5, and margin error (d) of 0.05 for the unknown population was 384. However, since the population under this study was less than 10,000 sample adjustment was done using the formula; nf = n / (1+ (n/N)), 9. N is the population size of non-oral health care workers in Imenti North District, which was 420. A sample size of 214 participants was thus used for the study.

All doctors, clinical officers and nurses offering services in the public health facilities were included in the sampling frame. To ensure proportional representation, probability proportion to size was used to distribute the participants among the targeted cadres, 168 nurses, 31 clinical officers, and 15 doctors were selected. Each facility level was assigned distribution based on staff proportion in the sampling frame. This was followed by a systematic selection of participants at the facility level.

A self-administered questionnaire, with questions formulated from emerging literature on the integration of oral health among non-oral health care workers, was used to collect data from the participants. The questionnaire was pretested in a facility that qualified but was not included in the study. A debrief was done to ensure clarity of questions and any ambiguity in terminologies or wording. The time taken to fill out the questionnaire was also assessed to help in planning for data collection. Self-administration data collection method was convenient since the study had large groups with different working schedules. Questionnaires were distributed at the start of the new shift and collected at the end of the shift. This resulted in a 100% response rate.

Level of knowledge was assessed under three sub-themes; diagnosis of oral diseases and conditions, oral health education and referral for oral health services. Rating was poor for those who scored less than 50% and adequate for a score of more than 50%. Questions on attitude and practice were categorized as good or poor and proportions for each score were calculated.

Analysis was done using the Statistical Package for Social Sciences (SPSS) version 17. Very little is known about the expected data from the study population, The Chi-square test, which

is robust enough to accommodate diversity in the study population, was thus used to test for significance. The odds ratio was then used to give the strength of the association between variables. A *p*-value of 0.05 was set for significance throughout the study.

Informed consent was obtained from all participants. Anonymity was ensured by the use of non-identifiers on the data collection form. Any identifiers used for follow-up and data analysis were de-identified post-analysis or at the point when the purpose of such identification was no longer required. Ethics clearance was sought and approved by the Kenyatta National Hospital/University of Nairobi Ethics and Research Committee.

## Results

There were 214 participants. 72% of these were female while 28% were male. Nurses were the majority at 168 (78.5%) followed by clinical officers at 31 (14.5%) and doctors formed the minority at 15 (7.0%). Only 2.8% had a master's level of education, the majority (55.6%) were diploma holders while 33.6% and 13.5% had certificates and bachelor's in their respective specialties. Only 20% of the participants had received training in oral health.

The majority (88%) of the respondents had adequate overall knowledge of the three domains of diagnosis, education and referral for oral health. As shown in Table 1, those with higher levels of training had significantly better knowledge (OR 5.8 (95% CI 2.3-14.8), $p<0.001$). Similarly, those who worked in a facility with a dental clinic had significantly better knowledge scores (OR 5.5 (95% CI 2.2 – 13.5), $p< 0.001$).

The relationship between oral health training and overall knowledge was also positively significant ($p=0.005$). Conversely, age, gender, duration of training and having a copy of referral guidelines did not significantly influence the level of oral health knowledge among the participants. A positive attitude was exhibited across all questions posed to the participants. As shown in Table 2, more than 90% of the participants responded positively to oral health-related actions.

***Table 1:***
Relationship between overall knowledge and predictor variables (n=214).

| | Variable | Overall knowledge score | | OR (95% CI) | P value |
|---|---|---|---|---|---|
| | | Adequate | Poor | | |
| Age | 20 – 29 | 35 (92.1) | 3 (7.9) | 1.0 | |
| | 30 – 39 | 41 (91.1) | 4 (8.9) | 0.9 (0.2 – 4.2) | 0.871 |
| | 40 – 49 | 56 (88.9) | 7 (11.1) | 0.7 (0.2 – 2.8) | 0.602 |
| | 50 – 59 | 39 (83.0) | 8 (17.0) | 0.4 (0.1 – 1.7) | 0.223 |
| Gender | Male | 50 (86.2) | 8 (13.8) | 0.7 (0.3 – 1.7) | 0.365 |
| | Female | 134 (90.5) | 14 (9.5) | 1.0 | |
| Level of training | Certificate | 56 (76.7) | 17 (23.3) | 1.0 | |
| | Diploma/Bachelors/Masters | 134 (95.0) | 7 (5.0) | 5.8 (2.3 – 14.8) | <0.001* |
| Dental health training | Yes | 43 (100.0) | 0 | - | 0.005* |
| | No | 147 (86.0) | 24 (14.0) | | |
| Duration of training | <10 | 67 (94.4) | 4 (5.6) | 1.0 | |
| | 10 – 19 | 46 (86.8) | 7 (13.2) | 0.4 (0.1 – 1.4) | 0.153 |
| | 20 – 29 | 47 (88.7) | 6 (11.3) | 0.5 (0.1 – 1.7) | 0.259 |
| | 30 – 39 | 27 (81.8) | 6 (18.2) | 0.3 (0.1 – 1.0) | 0.055 |
| Dental clinic in the facility | Yes | 139 (94.6) | 8 (5.4) | 5.5 (2.2 – 13.5) | <0.001* |
| | No | 51 (76.1) | 16 (23.9) | 1.0 | |
| Copy of referral guidelines | Yes | 34 (97.1) | 1 (2.9) | 5.0 (0.7 – 38.4) | 0.139 |
| | No | 156 (87.2) | 23 (12.8) | 1.0 | |

Almost all participants agreed that oral health was important to general health and believed it is possible to maintain good oral health hygiene. Similarly, a large percentage of the participants agreed that oral health education and dental health training for non-oral health care providers was important. They were also willing to attend oral health training given a chance and, would be willing to offer dental services if barriers were removed. A relatively higher percentage (7.9%) of participants were not agreeable to oral screening for their patients.

Oral screening for all clients under their care was done by only 12% of the participants. Figure 1 illustrates the distribution of participants by the percentage of clients they screen in their clinical work. The majority did not screen their patients. Table 3 shows a significant relationship was established between those who had received training in oral health and oral screening (OR 2.4 (95% CI 1.0 – 5.8), p=0.049).

***Table 2*:**
Respondents answer to attitude assessment

| Question | | Frequency (%) |
|---|---|---|
| Oral health important to general health | Yes | 212 (99.1) |
| | No | 1 (0.5) |
| Dental screening be done for all patients | Yes | 196 (91.6) |
| | No | 17 (7.9) |
| Oral health education is important | Yes | 212 (99.1) |
| | No | 2 (0.9) |
| Is it possible to maintain good health hygiene | Yes | 210 (98.1) |
| | No | 2 (0.9) |
| Dental health training for non-dental health care providers | Yes | 203 (94.9) |
| | No | 7 (3.3) |
| Willing to attend oral health training if given a chance | Yes | 204 (95.3) |
| | No | 5 (2.3) |
| If all barriers were removed would you be willing to offer dental services | Yes | 203 (94.9) |
| | No | 3 (1.4) |

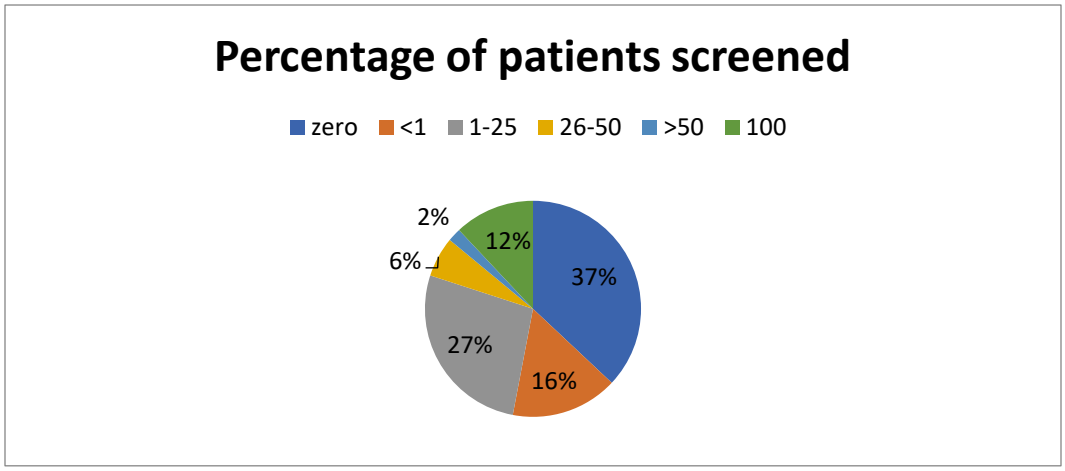


***Figure 1*:**
Percentage of patients screened by the participants

Similarly, those with treatment and referral guidelines were significantly more likely to do oral screening (OR 3.3 (95% CI 1.3 – 8.2), p=0.019). Adequate overall knowledge or knowledge in any of the three domains assessed did not have a significant influence on oral screening. Oral health screening was not significantly influenced by age, gender, level of training, duration of service, or the presence of a dental clinic in the facility.

Other dental services offered by the participants included oral health education at 65.4%, prescription relating to oral treatment at 33.6%, and referral of patients for oral treatment at 95.3%. As indicated in Figure 2, no participant offered fluoride application or any other form of dental service.

## Discussion

The seminal Alma Atta Declaration of 1978[11] called for a Primary Health Care (PHC) approach as a vehicle to achieve health care for all. Integration of oral health into this omnibus is however yet to be achieved, despite continued resolutions to do so[1,12]. The implementation at the national and local levels needs to be structured to fit the context. Thus, the establishment of the level of service integration and the factors influencing the integration process at the sub-national level is important. This study aimed therefore at determining oral health care services provision by the different non-oral health cadres and the correlates therefrom in Imenti North District in Kenya.

***Table 3:*** **Relationship between oral screening for all patients and potential covariates (n=214)**

| | Variable | Oral screening for ALL patients | | OR (95% CI) | P value |
|---|---|---|---|---|---|
| | | Yes (n=26) | No (n=188) | | |
| Age | 20 – 29 | 5 (13.2) | 33 (86.8) | 1.0 | |
| | 30 – 39 | 6 (13.3) | 39 (86.7) | 1.0 (0.3 – 3.6) | 0.981 |
| | 40 – 49 | 4 (6.3) | 59 (93.7) | 0.4 (0.1 – 1.8) | 0.254 |
| | 50 – 59 | 7 (14.9) | 40 (85.1) | 1.2 (0.3 – 4.0) | 0.819 |
| Gender | Male | 5 (8.6) | 53 (91.4) | 0.6 (0.2 – 1.7) | 0.333 |
| | Female | 20 (13.5) | 128 (86.5) | 1.0 | |
| Level of training | Certificate | 7 (9.7) | 65 (90.3) | 1.0 | |
| | Diploma/Bachelors/Masters | 19 (13.4) | 123 (86.6) | 1.4 (0.6 – 3.6) | 0.441 |
| Dental health training | Yes | 9 (20.9) | 34 (79.1) | 2.4 (1.0 – 5.8) | 0.049* |
| | No | 17 (9.9) | 154 (90.1) | 1.0 | |
| Duration of service | <10 | 10 (14.1) | 61 (85.9) | 1.0 | |
| | 10 – 19 | 3 (5.7) | 50 (94.3) | 0.4 (0.1 – 1.4) | 0.142 |
| | 20 – 29 | 6 (11.3) | 47 (88.7) | 0.8 (0.3 – 2.3) | 0.650 |
| | 30 – 39 | 6 (18.2) | 27 (81.8) | 1.4 (0.4 – 4.1) | 0.591 |
| Dental clinic in the facility | Yes | 22 (15.0) | 125 (85.0) | 2.8 (0.9 – 8.4) | 0.062 |
| | No | 4 (6.0) | 63 (94.0) | 1.0 | |
| Copy of treatment and referral guidelines | Yes | 9 (25.7) | 26 (74.3) | 3.3 (1.3 – 8.2) | 0.019* |
| | No | 17 (9.5) | 162 (90.5) | 1.0 | |
| Diagnosis score | Adequate knowledge | 24 (13.6) | 153 (86.4) | 2.7 (0.6 – 12.2) | 0.266 |
| | Poor | 2 (5.4) | 35 (94.6) | 1.0 | |
| Oral health score | Adequate knowledge | 22 (14.7) | 128 (85.3) | 2.6 (0.9 – 7.8) | 0.084 |
| | Poor | 4 (6.2) | 60 (93.8) | 1.0 | |
| Referral score | Adequate knowledge | 24 (14.0) | 147 (86.0) | 3.3 (0.8 – 14.8) | 0.092 |
| | Poor | 2 (4.7) | 41 (95.3) | 1.0 | |
| Overall knowledge scores | Adequate knowledge | 26 (13.7) | 164 (86.3) | - | 0.051 |
| | Poor | 0 | 24 (100.0) | | |

A good level of knowledge in oral health is linked to improved integration of oral health into PHC [8,13]. This study found the level of knowledge to be adequate for most of the participants (88%). These findings mirror those of an Iranian study among PHC workers where 90% had adequate knowledge13. In contrast, a Nigerian and American report points to poor oral health knowledge5,8. The difference between the two groups could be explained by the scope of knowledge questions. Adequate knowledge is observed when questions are on specific integration roles like in the current study. Conversely, poor levels of knowledge are observed when assessment is on general oral health knowledge5,8. This is a pointer to some form of oral health training for the non-dental health care workers within the preservice curriculum of this study participants. Those with higher levels of training had significantly better knowledge. As reported in other studies, training has a positive relationship with knowledge[7,14,15]. This could reflect, therefore, that there is inclusion of more oral health content in higher training curriculums. Similarly, those working in a facility with a dental clinic had significantly higher levels of knowledge compared to their counterparts. This could be linked to hospital-based continuous professional education at the facility level. The significant positive relationship between knowledge and oral health training in this study reinforces what has been reported elsewhere, that training is the foundation of oral health knowledge for non-oral health care workers[4,14,16]. This warrants a review of the different non-dental healthcare workers' training curriculums to assess oral health content to align it with the integration objectives. The role of interprofessional education at the facility level should also be evaluated to strengthen this avenue considering the high percentage of positive attitude towards oral health.

Translating knowledge to practice is not a linear relationship. It is influenced directly and indirectly by inherent individual traits and external factors related to the environment17. The knowledge in all three domains and overall knowledge did not translate to a significant influence on oral health screening.

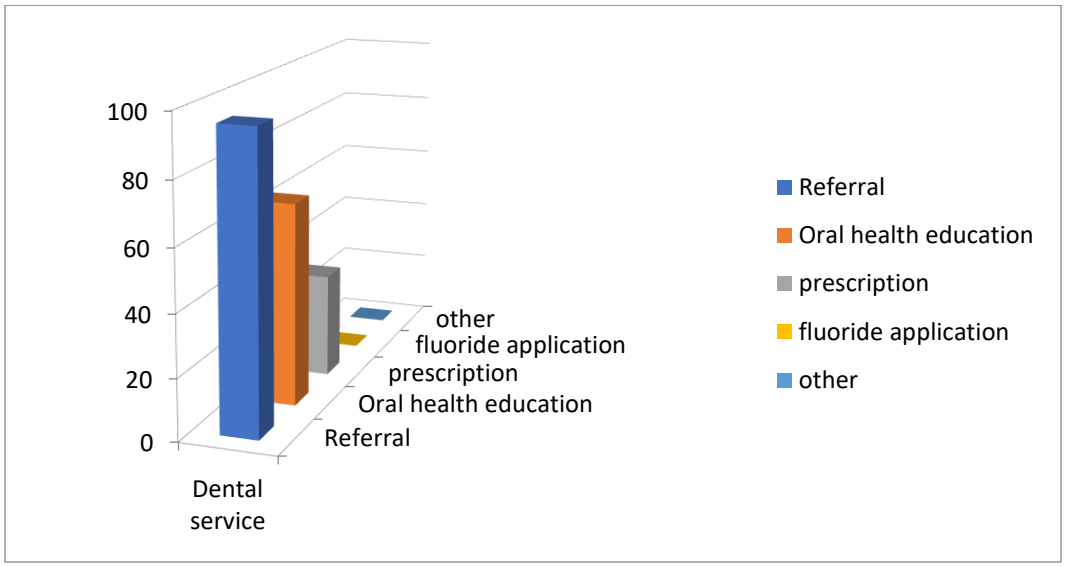


***Figure 2*:**
Oral health services provided by the participants

This could indicate a limitation of the training approach. Whereas didactic teaching of the participants in this study could have yielded good knowledge, translation to practice may need more practical approaches. These findings mirror those of a South African study where didactic oral health training among health promotion officers did not translate into practice18. Conversely, oral health training and availability of treatment and referral guideline booklet were significant determinants of oral health screening. Written reference materials have been shown to positively influence oral health practice when used as supplemental training materials[19,20]. Referral guidelines may thus be explored as a method of reinforcing learnt knowledge among non-oral health care workers.

The number of contacts that patients make with non-dental healthcare providers offers apt opportunities for health education including oral health since they serve in most entry points to the healthcare system. The relatively low number of participants offering oral health education are missed opportunity. Similarly, the low number offering oral-related treatment indicates continued patients suffering from unavailable oral urgent treatment1. It is however encouraging that almost all the participants refer patients with a need for oral health treatment since early diagnosis and interventions reduce the huge costs of advanced dental disease management1. The prompt treatment interventions would further help improve the oral health-related quality of life.

The study scope was limited to the healthcare worker characteristics in the integration process, the effect of other health systems building blocks was not explored. These may be confounders in the integration process21. This is reflected by participants' assertion that they lacked of training, materials and commodities for oral health services. Further, participants lacked policy guidelines revealing a dissemination and mentorship gap considering integration of oral health into PHC has been advocated for more than two decade[s22.]

The study further limited the scope to public health facilities, which means the results may not be extrapolated to private facilities. However, the majority of the residents in the Imenti North district utilize public health facilities. The results therefore reflect the status of oral health integration into primary healthcare among non-oral healthcare workers from whom a majority of the residents of in Imenti North district seek services.

## Conclusion and recommendations

Non-oral health care providers in Imenti North have good knowledge and a positive attitude towards oral health. However, oral health services provision among non-oral health care workers in the Imenti North district is poor. Training in oral health is the main predictor for oral health knowledge and oral health screening. Training needs however to be practical and be accompanied by facilitating building blocks to translate into practice. An appraisal of current curriculums for non-oral health care providers is recommended. Oral health training should be included where missing or expanded to include all elements of basic oral health for primary health care. There is a need to consider in-service oral health training that is contextual.

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