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Original Research Article

The Challenges to Data Quality, at the Patient-Provider Interface of the School Dental Service, in the Western Province of Sri Lanka: A Qualitative Study

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Abstract: School Dental Service is the main oral health programme established to provide curative and preventive oral health care to children of ages 3 to 13 years in Sri Lanka. The information generated through the management information system is hence imperative to describe the oral health status of the children, resource allocation and for rational decision, making at all levels of the school dental service. The purpose of this study was to explore the challenges to quality of data generated at the patient-provider interface of the management information system of the School Dental Service in the Western Province of Sri Lanka. A qualitative exploratory study with School Dental Therapists was conducted, in the form of in-depth interviews. Twelve out of 101 school dental therapists were purposively selected and semi structured interviews were conducted in the last quarter of 2019, until the data saturation was achieved. A thematic analysis was performed to achieve the results. According to the results, the challenges to the quality of data generated at the patent provider interface of school dental service could be explained under three thematic areas. The issues related to reporting system and records, the working environment and the personal perceptions on data collection were the emerged areas of constrains to the data quality in the school dental service in the Western Province of Sri Lanka. The quality of data in the Management Information System of School dental Service could be further enhanced by addressing the issues identified under the key thematic areas at the patient provider interface.

Keywords: Quality of data, School Dental Service, patient-provider interface.

INTRODUCTION

The school dental service was established in 1951, with the intension of having a school-based preventive programme to attend the children's need in dental care in Sri Lanka (Cooray & De Silva, 2016). To date, the school dental service (SDS) plays an important and significant role in the Maternal and Child Health programme. School dental therapists (SDTTs) who are based in School dental clinics, provide basic oral health care and oral health promotions for children aged 3-13 years (Ministry of Health, 2008). The monitoring and evaluation of school dental programme is done through a standardized Management Information System of the SDS which was established in 2009 (Ministry of Health, 2009).

The quality of data at the patient provider interface is important to the patient and the provider in numerous aspects. The quality of personal records ensures the accuracy of care provision, continuity of care and legal backup where necessary (Mathioudakis, Rousalova, Gagnat, Saad, & Hardavella, 2016). Low information quality can increase medical errors and decrease quality of care. In addition, patient records are important to the care provider to ensure accountability for care provision, and to protect against legal claims

(Marinič, 2015; Mathioudakis *et al*., 2016). Furthermore, data are important for information generation with in the health care system for reasons other than clinical care, such as public health surveillance, evaluation of the quality of health care delivery, and to make policy decisions (Lucyk, Tang, & Quan, 2017). Therefore, high-quality data are regarded as the basic prerequisite for better information and better decision-making (Chen, Hailey, Wang, & Yu, 2014). Many studies done to evaluate the health information systems in developing countries have found that the data received are often not helpful for management decision making because they are incomplete, inaccurate, untimely, obsolete, and are unrelated to priority tasks and functions of local health personnel (Sandiford, Annett, & Cibulskis, 1992). In a study to identify the challenges of record keeping experienced by nurses in selected public hospitals in Limpopo Province, South Africa found that record-keeping errors could occur due to various issues (Mutshatshi, Mothiba, Mamogobo, & Mbombi, 2018). Adding to this another study done to identify the barriers in data coding found that the main problem to data quality occurs at the level of data generation (Lucyk *et al*., 2017). Therefore, addressing the challenges to data quality at patient provider interface where initial data generation takes place will invariably improve the data quality through out the MIS structure.

According to Kaplan and Maxwell (2005) qualitative research enables in-depth understanding of a phenomenon from the point of view of the participants and its particular social and institutional context. Therefore, by applying qualitative research methods to understand the ground reality of the challenges to data quality enable researchers to study the research problem in social and cultural phenomena within which the problem exist.

The SDTT is responsible for data generation in the MIS of SDS and it is assigned in their job description (Ministry of Health, 2008). She transforms patient information into data which goes through the information generation process up to the national level. Although the judgement of primary data handlers on data generation process is important to evaluate the existing system, their opinion for the data generation process was not been assessed (Lippeveld, Sauerborn, Bodart, & World Health Organization, 2000; Raeisi, Saghaeiannejad, Karimi, Ehteshami, & Kasaei, 2013). Therefore, a qualitative study was conducted to identify the challenges to data quality at the patient provider interface, in the view of data handlers in the grass root level of the SDS.

MATERIAL AND METHODS

A qualitative research design was applied to gather data. In-depth interviews were conducted with 12 SDTTs who were purposively selected out of 101 SDTTs. The sample size was determined on two criteria. Firstly, PI was concerned on achieving theoretical saturation point. The theoretical saturation point meant the point at which the researcher acquires sufficient information to understand the social process meaning fully (Bloor & Wood, 2006; Sofaer, 2002). Since the saturation point is influenced by many other factors and could be subjective (Mason, 2010), according to literature review the sample size was needed to be at least 12 (Guest, Bunce, & Johnson, 2006). Therefore, at the point of 12 participants, where the principle investigator (PI) decided that the saturation point was accomplished, the data collection was stopped. Data Collection was conducted over a period of 3 months from October 2019 to December 2019.

Data were collected using an interview guide with a flexible loose structure to accommodate a free flow of information from the respondents. The interview guide was developed through literature review and in consultations with the public health experts. The questions were formulated in English and translated to Sinhala to have more comfortable conversations with the mother tongue. The guide was used, only to lead the discussion in the expected direction to gain maximum information from the participant. An expert in sociology and qualitative research trained the PI and the note taker on conducting in-depth interviews. Three interviews were conducted as a pre-test, in Galle district to identify the difficult areas for probing and to determine the timing of the interviews.

The interviews were done at selected School dental clinics (SDCs), after 2.30 pm to avoid any disturbances. The PI moderated the interviews and the assistant took notes. They were conducted in Sinhala language and average time taken for individual interviews ranged from 30 – 45 minutes. All interviews were recorded on audiotapes with prier permission in addition to taking down notes. Field notes were able to capture the non-verbal cues. At the end of each discussion, the information gathered through the discussion was summarized and presented back to the SDTT for further clarifications to ensure a true reflection of the challenges they experienced during data recording. The interviews allowed for detailed exploration of individual experiences and perceptions on generating quality data at primary care facilities.

Data were analysed using the thematic analysis method for qualitative research (Nowell, Norris, White, & Moules, 2017). The audio tapes of the interviews were transcribed verbatim on the same day. They were compared with the field notes taken by the note taker. PI read the script several times to be familiar with the content generated through the interviews and wrote down the common themes generated by each discussion. The common themes were clustered together and were arranged in major topics. These

topics were then given codes and codes were written next to the appropriate segment of the text. Transcripts were coded using an independent coder and themes were identified. The transcriptions and coding was subjected to peer scrutiny and expert opinion was taken before finalization to ensure Conformability. The researcher identified and set aside preconceived ideas and beliefs about quality of data in SDS in order to minimise bias. All measures were taken to ensure the trustworthiness of data (Nowell *et al.*, 2017).

Permission to carry out the study was obtained from Director General of Dental Services, the Western Provincial Director of Health Services and the Regional Directors of Health Services of the respective districts and the relevant authorities of the Ministry of Education. All the school principals were informed and copies of permission letters were produced before entering the SDCs. Ethical clearance was obtained from the Ethical Review committee, University of Colombo. Informed verbal consent was obtained from the participants, by explaining the research purpose and allowing them to clarify any doubts. They were given every right to decline the invitation to participate in the interview without prejudice. They were assured the nature of their voluntary participation. SDTTs were assured of confidentiality and anonymity. All the participants who were invited to participate did not refuse to participate.

Key Definitions

School Dental Therapist

A School dental therapist is a person who is registered under the service category Para Medical Services in the Ministry of Health, Sri Lanka. She is a professional who is trained to render health promotional activities in the community and to perform primary and secondary preventive activities for children of 3 -13 years. She has a target of 2000 students to cover. Documentation of care provided, is an integral part of her service (Ministry of Health, 2014).

Patient-provider interface

Platform where the patient and health care provider encounter takes place.

Challenge

It is described as a burdensome situation with an array of context or circumstances at a given time (Matlakala, Bezuidenhout & Botha 2014). In this study, challenges are those problems experienced by SDTTs with regard to maintaining data quality while caring for patients at school dental clinics.

RESULTS AND DISCUSSION

Table-01: Socio demographic profile of the participants (school dental therapists)

Participant	District	Age	Education	Experience	Distance to work	Target population
SDTT A	Colombo	42	Diploma	18	25	1916
SDTT B	Colombo	49	Diploma	25	6	2620
SDTT C	Colombo	50	Diploma	28	10	4130
SDTT D	Colombo	47	Diploma	21	12	1553
SDTT E	Gampaha	47	Diploma	21	14	6709
SDTT F	Gampaha	33	Diploma	8	15	6300
SDTT G	Gampaha	49	Diploma	25	8	3193
SDTT H	Gampaha	48	Diploma	22	20	4447
SDTT I	Kaluthara	51	Diploma	28	8	3730
SDTT J	Kaluthara	52	Diploma	28	18	4531
SDTT K	Kaluthara	34	Diploma	8	4	2561
SDTT L	Kaluthara	44	Diploma	20	6	4154

Table-02: Summary of the results of the in depth Interview

Key themes identified
Theme 1 - challenges related to reporting system and records. Theme 2 - Challenges related to the working environment. Theme 3 - Challenges related to personal perceptions
Themes 1 - **challenges related to reporting system and records**
Too many documents Repetition of same information in several documents. Physical properties and structure of the forms not favourable for the working conditions. Some information gathered are not useful for the purpose they are in.
Theme 2 – Challenges related to the working environment.
Lack of facilities in the working environment. Lack of time Expected targets and workload.

Inadequate in-service training on MIS of SDS.
Theme 3 - Challenges related to personal perceptions.
Lack of recognition of the importance of data. Lack of job satisfaction due lack of incentives for work done. Lack of motivation due to unavailability of carrier paths.

Although data recording is an integral part of the job description of SDTTs, they found the task is challenging due to many issues. The issues that emerged are described below in narrative form under three themes.

Challenges related to reporting system and records

According to this study, some issues immerged could be summarized under the theme "Challenges related to reporting system and records." We found that the design and format of the documents used for data recording had a significant impact on data quality at the patient provider interface.

Having too many documents and repetition of same information in several documents was conveyed in many comments of the participants. All the participants agreed that, the task of maintaining too many records are laborious, time consuming and unpleasant. They also felt that recording the same information in many places lead to data redundancy. Similar evidence were generated in a study conducted to assess the nurses' workload, where they found that, it was difficult to cope with the increased workload associated with documenting patient information on the multiple records (Shihundla, Lebese, & Maputle, 2016). Chatterji *et al*. (2009) in his study has shown that the existence of complex reporting tools and reporting procedures negatively affect data Quality.

SDTT-A, expressed her opinion on too much documentation as, *Doctor there are too many book works. See, we have to fill same patient information at least in three documents for children in the base school.*

This was confirmed by SDTT-B expressing it as, *but we have too much writing to do. Just think, writing around 100 names twice on a screening day. The thought of it makes me stressed on top of other difficulties.*

Unfavourable physical properties and structure of the forms is another issue highlighted. Lack of space in each cells and the size of the books were among the main concerns. Another study confirmed that the main reasons for the poor comprehensiveness of the data were: the excessively high number of cells to complete in the documents; the restricted size of the cells(Glèlè Ahanhanzo *et al*., 2014). It was noted that the SDTTs adopting their own methods to record data, due to lack of user friendliness of the formats. This could be regarded as a failure of the existing format structure. Such poor data management practices can lead to recurrent data errors which is common in paper based systems (Adane, Gizachew, & Kendie, 2019) . Kiprono, Cheburet, GeorgeW.Odhiambo, and Otieno (2016) found that lack of user-friendliness of formats could abate the quality of data. Redesigning of recording formats and introducing computerized health management information systems were proven to be effective in addressing these issues (Adane *et al.*, 2019; Krishnan, Nongkynrih, Yadav, Singh, & Gupta, 2010; Lucas, 2008; Okaisu, Kalikwani, Wanyana, & Coetzee, 2014).

SDTT E explained: *when I do mobile clinics, I use a separate sheet (half sheet/foolscap paper) to record the work done. After coming to the clinic, I enter the records into the Daily Record and Patient Register. The Daybook is too long and we have no proper space to keep our books. This way the book will not get untidy.* She was committed to maintain the neatness of the standard records for administrative purposes, but was unaware of the possible data quality issues that would result in this.

SDTT C stated: *we have big outreach clinics to cover. On the screening day, all the pts are entered in the patient register by roughly looking at the mouth. When there are lot of patients only summary is entered into the daybook.* This statement portraits the magnitude of the data quality that can be affected when recording the caries status in the mouth.

Another SDTT said that, *the daily record is like a mat, it is very difficult to handle the book in outreach clinics.* Regarding the space allocated in the books, one participant express her view; *there is no space to write the decayed teeth and the treated teeth in the Daily record. We squeeze everything in to the small square provided, sometimes, I myself can't recognize the teeth specially when entered in a rush.*

Many participants enunciated that, some information gathered are not useful for the purpose they are in. In addition, it was obvious that their attitudes were towards fulfilling the administrative demands rather considering data accuracy and completeness. Many studies suggest that these drawbacks could affect the Quality of records *(Chatterji et al*., 2009; Kiprono *et al*., 2016; Robey & Lee, 1990).

SDTT H: *I never enter the standard registration number, because it is too long and useless. Patients' name, class, and class Reg. no. is more than enough to trace the child.*

Another SDTT stated that, there are unnecessary data fields in the daily records. *I only fill the data needed. No point of filling all the information with regard to examination because it is difficult to trace the patient in daily record in subsequent visits.*

SDTT I: *I think details in the history chart should be incorporated into the patient register and terminate the history chart. This way, we will have fewer documents. Moreover, we will be able to get a good idea of our patients while they are under our care.*

Therefore, a reform of formats with shorter forms with pertinent items from the health workers' point of view is highly regarded to improve the data quality at the patient provider interface.

Challenges related to the working environment

The Qualitative probing could bring up many issues in the working environment, which curtailed the data quality at the patient provider interface. One of the key issues was inadequate facilities for data recording. Many participants highlighted that lack of facilities such as poor lighting, dusty places with insufficient ventilation, at the outreach clinics could lead to diagnostic errors and therefore data inaccuracies. This was a concerning finding since it can adversely affect the accuracy of the patient and the provider out come in addition to data errors. On top of this there were many issues related to data storage at the clinic level. Some of the data could not retrieve due to destruction of papers due to poor storage conditions. In addition, limited resources for communication, IT facilities, and photocopy facilities at the work place had repercussions on data quality at the patient provider interface. It was proven that such errors could occur in the primary care settings due to limited facilities in the developing countries (Singh, Schiff, Graber, Onakpoya, & Thompson, 2017).

One participant expressed her displeasure*: Did you see how we do outreach programmes? No lights, no water. They should give us an allowance for doing clinics in these grave conditions. It is very hot in here.*

A participant told: *there are lot of phone calls to make to arrange the outreach programmes. We don't have telephone facilities. We have to bear from our personal money.*

SDTT G: During the last year floods, my history charts were destroyed.

Another key issue immerged was lack of time to maintain records according to the standards. This was complex due to many interdependent problems. The SDTT worked alone in her clinic and was overburdened with treatment targets. In addition, collection of enormous amount of data posed an unnecessary burden to collector. Kiprono *et al.* (2016) found that most health facilities were having one staff and they were expected to see patients; complete many registers and compile summaries and submitt to the relevant officers. There were other studies to prove that, time constrains due to multiple reasons could adversely affect the quality of data at the patient provider interface (Mutshatshi *et al*., 2018).

SDTT E expressed as, *it is very difficult to screen around hundred children in an outreach programme and complete their records and treatment in 3 days.*

SDTT G, *too many books works. Not enough time to complete all the books. Most of the time record completion done at home.*

All the SDTTs continually cited that increased number of target population as an important reason for substandard data quality. Although, a national target is 2000 schoolchildren per therapist, many had higher target groups due to inadequate human resources. During interviews, the SDTTs indicated that they were overworked, as they had to do lot of work related to patient care and this could result in poor recording keeping. Some authors have shown that extra workload, predisposes to decreased morale and inadequate work practices, including poor recording practices (Mutshatshi *et al*., 2018; Shihundla, Lebese, & Maputle, 2016).

SDTT F: *See doctor, my target group is 6300 how can I complete the targets and do the records*

SDTT K said that: '*When we take a pt. to the chair, we give oral health instructions, and do the examinations, and most of the time attends presenting complain. It is not possible to record everything you have done due to lack of time; it is too much paper work.*

This study identified that limited capacity development on record keeping is another limiting characteristic to data quality. Many SDTTs agreed that in-service training programmes were mainly targeted at updating the clinical knowledge, but not in the area of improving the data recording skills. A systematic review to explore the organizational factors determining data quality supported this fact (Hlaing & Zin, 2020). Another study revealed that training was not usually provided for clinic staff involved in data collection processes who often, have very limited data quality checking skills, and do not understand the value of the data being collected;(Nicol, Bradshaw, Phillips, & Dudley, 2013).

Challenges related to personal perceptions

A key thematic area emerged from our study was the effect of personal perceptions on data quality. It was observed that during data collection that some records were very neat and completed according to

guidelines, while others were incomplete. During the in-depth interview, one major issue identified was that, the data recording and record keeping was not recognised as an important component of patient care by some participants. This may be due to lack of bottom up discussions on data for action in the decision making levels. Many studies emphasise the importance of reorientation of health workers at all levels of the system to change their attitudes in the way they handle data, due to the value of data in achieving organizational targets (Manzi *et al.*, 2012).

SDTT B stated that, *even though my records are not always up to the standard I am bound to treat my target group of children. Some people have good records but don't treat the pts. I think pts health is more important than the records.*

SDTT H told that, *dmft scores are good for researchers but not very important for pt. management.* One of the therapists expressed *that in my opinion the resource allocation is not done according to the statistic, but given to everybody regardless of the performance.*

In addition, Low job satisfaction due lack of incentives, absence of work appraisals and carrier paths were other factors affecting the overall performance of the SDTTs including the MIS quality. Poor recognition of work performed and lack of incentives to carry out the assigned work were among the main downscaling facts for data quality. Related studies showed that providing financial incentives were associated with data quality (Daneshkohan, Alimoradi, Ahmadi, & Alipour, 2022; Glèlè Ahanhanzo *et al*., 2014).

A participant told, *there are lot of phone calls to make to arrange the outreach programmes But no allowance is given. I have to bear from personal money.*

SDTT E expressed: *The assistant has to spend out of her pocket for traveling to give the consent cards to the school, which is not reimbursed to her.*

In addition, lack of carrier paths in the field of SDS affects the quality of performance. Therefore, the participant's motivation towards maintaining quality records were low due to unavailability of performance based work appraisal system with carrier paths. A study conducted to identify the Impact of performance appraisal on employee's performance found that staff motivation acts as a moderator positively affects the relationship between performance appraisal and employee's performance (Iqbal, Ahmad, Haider, Batool, & Ul-ain, 2013). The Influence of Performance Appraisal on Quality of Service Delivery: was well established in a study done in Primary Health Care Facilities, Southwestern Nigeria (Adepoju, Opafunso, & Lawal, 2017). Therefore introducing performance appraisal system with carrier path could improve the quality of data in the SDS.

CONCLUSIONS

The qualitative study identified that the reporting system and records, the working environment and the personal perceptions of the care provider could influence the quality of data. It was evident that many issues were interdependent. Hence, multifaceted interventions may have a considerable impact on improving the data quality at the patent provider interface of the school dental service. Redesigning the reporting formats to improve the functionality of the records and to eliminate data redundancy, strengthening the working environment to facilitate the trusty, timely, and dynamic data collection and improving the workers' performance by regular appraisal, in-service training on MIS data and financial incentives are recommended to improve the quality of data in the SDS in the Western Province. In addition, more investments on computerized health information will undoubtedly improve quality of data at the patent provider interface of school dental service.

Although the objectives of the study were successfully accomplished, the evidence generated was limited to the study area of Western Province. Nevertheless, the Western Province in Sri Lanka is the most developed Province with many resources; the issues discussed may present in the resource limiting areas as well. However, further studies are recommended to unearth more generalized view on factors affecting the data quality of the school dental service.

REFERENCES

- Adane, K., Gizachew, M., & Kendie, S. (2019). The role of medical data in efficient patient care delivery: A review. *Risk management and healthcare policy*, *12*, 67-73. doi:10.2147/RMHP.S179259
- Adepoju, O., Opafunso, Z., & Lawal, A. (2017). Influence of performance appraisal on quality-of-service delivery: A case of primary health care facilities, south-western nigeria. *IOSR Journal of Business and Management*, *19*(3), 73-81.
- Bloor, M., & Wood, F. (2006). Keywords in qualitative methods (10.4135/9781849209403). London: SAGE Publications Ltd. Retrieved from https://methods.sagepub.com/book/keywords-in-qualitative-methods. doi:10.4135/9781849209403
- Chatterji, M., Hutchinson, P., Murray, N., Buek, K., Mulenga, Y., & Ventimiglia, T. (2009). Measure evaluation.
- Chen, H., Hailey, D., Wang, N., & Yu, P. (2014). A review of data quality assessment methods for public health information systems. *International journal of environmental research and public*

health, *11*(5), 5170-5207. doi:10.3390/ijerph110505170

- Cooray, H. W. M., & De Silva, D. (2016). One hundred years of dentistry in sri lanka. 141, Vauxhall Street, Colombo 02: Dental Services Co. (Pvt) Ltd.
- Daneshkohan, A., Alimoradi, M., Ahmadi, M., & Alipour, J. (2022). Data quality and data use in primary health care: A case study from iran. Informatics in Medicine Unlocked, 28, 100855. doi:https://doi.org/10.1016/j.imu.2022.100855
- Glèlè Ahanhanzo, Yolaine Ouedraogo, L., Kpozèhouen, A., Coppieters, Y., Makoutodé, M., & Wilmet-Dramaix, M. (2014). Factors associated with data quality in the routine health information system of benin. *Archives of Public Health*, *72*, 25. doi:10.1186/2049-3258-72-25
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? Field Methods - FIELD METHOD, 18, 59-82. doi:10.1177/1525822X05279903
- Hlaing, T., & Zin, T. (2020). Organizational factors in determining data quality produced from health management information systems in low- and middle-income countries: A systematic review. Health Informatics - *An International Journal*, *9*, 1-17. doi:10.5121/hiij.2020.9401
- Iqbal, N., Ahmad, N., Haider, Z., Batool, Y., & Ul-ain, Q. (2013). Impact of performance appraisal on employee's performance involving the moderating role of motivation. *Oman Chapter of Arabian Journal of Business and Management Review*, *34*(981), 1-20.
- Kaplan, B., & Maxwell, J. (2005). Qualitative research methods for evaluating computer information systems (10.1007/0-387-30329-4_2pp. 30-55).
- Kiprono, S., Cheburet, GeorgeW.Odhiambo, -., & Otieno. (2016). Technological factors affecting data quality of routine health management information system: Case of uasin gishu county referral hospital, kenya.
- Krishnan, A., Nongkynrih, B., Yadav, K., Singh, S., & Gupta, V. (2010). Evaluation of computerized health management information system for primary health care in rural india. *BMC health services research*, *10*(1), 310. doi:10.1186/1472-6963-10-310
- Lippeveld, T., Sauerborn, R., Bodart, C., & World Health Organization. (2000). Design and implementation of health information systems.
- Lucas, H. (2008). Information and communications technology for future health systems in developing countries. Soc Sci Med, 66(10), 2122-2132. doi:10.1016/j.socscimed.2008.01.033
- Lucyk, K., Tang, K., & Quan, H. (2017). Barriers to data quality resulting from the process of coding health information to administrative data: A qualitative study. *BMC Health Serv Res*, *17*(1), 766. doi:10.1186/s12913-017-2697-y
- Manzi, F., Schellenberg, J. A., Hutton, G., Wyss, K., Mbuya, C., Shirima, K., . . . Schellenberg, D. (2012). Human resources for health care delivery in tanzania: A multifaceted problem. Human resources for health, 10, 3-3. doi:10.1186/1478-4491-10-3
- Marinič, M. (2015). The importance of health records. Health, 07, 617-624. doi:10.4236/health.2015.75073
- Mason, M. (2010). Sample size and saturation in phd studies using qualitative interviews. Forum Qualitative Sozialforschung / *Forum: Qualitative Social Research*, *11*(3). doi:10.17169/fqs-11.3.1428
- Mathioudakis, A., Rousalova, I., Gagnat, A. A., Saad, N., & Hardavella, G. (2016). How to keep good clinical records. *Breathe (Sheffield, England)*, *12*(4), 369-373. doi:10.1183/20734735.018016
- Ministry of Health. (2008). General circular no:01-26/2008,job description of school dental therapists. Ministry of Health, Sri Lanka: Office of the DDG(DC).
- Ministry of Health. (2009). Guideline on mis for school dental service. Family Health Bureau.
- Ministry of Health. (2014). Job description of school dental therapist. (02-94/2014).
- Mutshatshi, T. E., Mothiba, T. M., Mamogobo, P. M., & Mbombi, M. O. (2018). Record-keeping: Challenges experienced by nurses in selected public hospitals. Curationis, 41(1), e1-e6. doi:10.4102/curationis.v41i1.1931
- Nicol, E., Bradshaw, D., Phillips, T., & Dudley, L. (2013). Human factors affecting the quality of routinely collected data in south africa. Studies in health technology and informatics, 192, 788-792. doi:10.3233/978-1-61499-289-9-788
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis:Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*(1), 1609406917733847. doi:10.1177/1609406917733847
- Okaisu, E., Kalikwani, F., Wanyana, G., & Coetzee, M. (2014). Improving the quality of nursing documentation: An action research project. Curationis, 37. doi:10.4102/curationis.v37i1.1251
- Raeisi, A. R., Saghaeiannejad, S., Karimi, S., Ehteshami, A., & Kasaei, M. (2013). District health information system assessment: A case study in iran. Acta informatica medica : AIM : journal of the Society for Medical Informatics of Bosnia & Herzegovina : casopis Drustva za medicinsku informatiku BiH, *21*(1), 30-35. doi:10.5455/aim.2012.21.30-35
- Robey, J. M., & Lee, S. H. (1990). Information system development in support of national health

programme monitoring and evaluation: The case of the philippines. *World Health Stat Q, 43*(1), 37-46.

- Sandiford, P., Annett, H., & Cibulskis, R. (1992). What can information systems do for primary health care? An international perspective (Vol. 34).
- Shihundla, R. C., Lebese, R. T., & Maputle, M. S. (2016). Effects of increased nurses' workload on quality documentation of patient information at selected primary health care facilities in vhembe district, limpopo province. *Curationis, 39*(1), 1545. doi:10.4102/curationis.v39i1.1545
- Shihundla, R. C., Lebese, R. T., & Maputle, M. S. (2016). Effects of increased nurses' workload on quality documentation of patient information at selected primary health care facilities in vhembe district, limpopo province. *Curationis, 39*(1), 1545-1545. doi:10.4102/curationis.v39i1.1545
- Singh, H., Schiff, G. D., Graber, M. L., Onakpoya, I., & Thompson, M. J. (2017). The global burden of diagnostic errors in primary care. *BMJ quality & safety, 26*(6), 484-494. doi:10.1136/bmjqs-2016-005401
- Sofaer, S. (2002). Qualitative research methods. International Journal for Quality in Health Care, *14*(4), 329-336. doi:10.1093/intqhc/14.4.329