

## Research Report

## Constraints on the performance of school-based dental program in Yogyakarta, Indonesia: A qualitative study

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### ABSTRACT

**Background:** A high prevalence of caries at ages  $\geq 12$  in Yogyakarta province (DMFT = 6.5), raises the question of the effectiveness of the school-based dental program (SBDP) which, as a national oral health program in schools, is organized by community health centers (CHCs). **Purpose:** The aim of this study is to explore the possible constraints on work processes which might affect the performance of SBDPs in controlling caries. **Methods:** In-depth interviews was conducted in twelve CHCs, covering all five districts both in urban and rural areas. Subjects were 41 dentists and dental nurses working in these CHCs. The interviews were structured according to the following themes: resources and logistics; program planning; target achievement; monitoring and evaluation; and suggestions for possible improvements. The data were analyzed using content analysis. **Results:** The main constraints identified were limited resources and inflexible regulations for resource allocation in the CHC, and inadequate program planning and program evaluation. Inadequate participation of parents was also identified. Another constraint is that policy at the district level orientates oral health towards curative intervention rather than prevention. Suggestions from interviewees include encouraging a policy for oral health, task delegation, a funding program using school health insurance, and a reorientation towards prevention. **Conclusion:** The weakness of management processes and the unsupported policy of the SBDP at the local level result in a lack of effectiveness. The constraints identified and suggestions for improvements could constitute a basis for improving program quality.

**Key words:** School-based dental program, program constraints, Yogyakarta

### ABSTRAK

**Latar Belakang:** Tingginya prevalensi karies pada usia  $\geq 12$  tahun (DMFT = 6.5) di Provinsi Daerah Istimewa Yogyakarta (DIY) menimbulkan pertanyaan akan efektifitas Usaha Kesehatan Gigi Sekolah (UKGS). UKGS adalah salah satu program nasional di bidang kesehatan gigi dan mulut yang dilaksanakan oleh Puskesmas. **Tujuan:** Tujuan dari penelitian ini adalah untuk mengeksplorasi hambatan pada pelaksanaan UKGS yang dapat mempengaruhi kinerja dari UKGS untuk mengontrol karies. **Metode:** Penelitian kualitatif dengan menggunakan in-depth interview dilakukan di 12 Puskesmas, meliputi lima kabupaten di DIY baik di daerah pedesaan maupun perkotaan. Subyek terdiri dari 41 dokter gigi dan perawat gigi di Puskesmas. Struktur tema dari wawancara adalah sumber daya dan logistik; perencanaan program; pencapaian target; monitoring dan evaluasi; saran untuk perbaikan program. Data dianalisis menggunakan analisis konten. **Hasil:** Hambatan pada program UKGS yang teridentifikasi adalah sumber daya yang terbatas dan regulasi yang tidak fleksibel untuk alokasi sumber daya di Puskesmas, perencanaan dan evaluasi program yang tidak memadai dan rendahnya peran serta orang tua. Hambatan lain adalah kebijakan pada tingkat kabupaten yang berorientasi pada pelayanan kuratif daripada preventif. Saran yang dikemukakan adalah penguatan kebijakan untuk kesehatan gigi, delegasi tugas, asuransi kesehatan sekolah dan reorientasi pelayanan preventif. **Kesimpulan:** Proses manajemen yang lemah dan kurangnya dukungan kebijakan untuk UKGS pada tingkat daerah menjadi salah satu sebab kurang efektifnya program. Hambatan dan saran yang teridentifikasi pada studi ini dapat menjadi dasar untuk meningkatkan mutu program.

**Kata kunci:** Usaha kesehatan gigi sekolah, hambatan program, Yogyakarta

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## INTRODUCTION

Over the years, caries experience index (Decay Missing Filling Teeth (DMFT)) of 12-year-old Indonesian children increased from DMFT = 0.7 in the 1970s, to 2.3 in the 1980s, and 2.7 in the 1990s.<sup>1</sup> From a national epidemiological survey in 2007, it appears that Yogyakarta province, situated on the island of Java, had a very high caries experience on aged  $\approx$ 12 years (DMFT = 6.5), compared with an average experience for all Java (DMFT = 4.8) and for all Indonesia (DMFT = 4.9).<sup>2</sup> The caries experience was higher than that of Thailand (DMFT = 3.7) and India (DMFT = 3.9) which have comparable characteristics of developing countries.<sup>3</sup> These data show that in Indonesia, and in Yogyakarta in particular, it is very difficult to control the progression of caries.

The high rate of caries prevalence was unsatisfactory finding related to the national effort of school health. In Indonesia, children are expected to benefit from the school-based dental program (SBDP), a national oral health program aimed at prevention and promotion which has been a part of national school health policies. This program is organized by community health centers (CHCs) which play an important role in the national health program by delivering comprehensive and integrated health services to the community under the authorization of the District Health Office (DHO). The organization and operation of the school-based dental program is regulated by the Ministry of Health of Indonesia, which has published a manual on it.<sup>4</sup> Dental staff (dentists and dental nurses) working in CHCs are responsible for the implementation of the SBDP, together with other tasks in the dental clinic or serving in the community. In the SBDP, a dentist is in charge of program management, while dental nurses help with the implementation of the program, for instance, by recording, reporting, and carrying out the program in schools. In practice, dentists and dental nurses work closely together in implementing the program.

According to the manual, the activities in SBDP including training teachers in matters of oral health, oral health screening followed by oral health education in the classroom, practice tooth brushing in school and complete treatment upon referral to the CHC. Within the SBDP, screening and dental health education are free of charge, but treatment in a CHC dental clinic upon referral is charged for. The charges vary depending on district policy.

The increasing caries rate of children raises the question of whether the SBDP is adequate in controlling caries. This assumption has been strengthened by unpublished reports

of CHCs in Yogyakarta showing that the SBDPs often fail to achieve their operational targets. It is well known that in developing countries, the insufficient infrastructure and lack of financial means are major problems in the provision of health programs for the community.<sup>5</sup> This sort of information is rather broad, while to improve the performance of programs like the SBDP, there is a need to look deeper within the program. Therefore, the research question of this study is; what are possible constraints on work processes which might affect the performance of SBDPs in controlling caries. This study aimed at exploring the major factors of constraints in four categories: resources and logistics; action plans; achievement of targets; monitoring and evaluation.

## MATERIALS AND METHODS

The study was carried out as a part of evaluation study on school-based dental program in 2009–2010 in Yogyakarta province, located on the island of Java. It is the second smallest province in Indonesia and has a high population density: 3.5 million people in an area of 3185.8 km<sup>2</sup>.<sup>6</sup> Yogyakarta province consists of five districts: Sleman, Gunung Kidul, Bantul, KulonProgo, and Yogyakarta city, which together have 117 CHCs, each of which must run a SBDP.<sup>7</sup> A qualitative study was conducted using in-depth interviews such as those used previously to gain a more in-depth insight of the subjects under study.<sup>8</sup>

Sampling technique was non probabilistic—which is called purposive sampling. This technique was chosen on the assumption that the investigator wants to discover, understand and gain insight and therefore must select a sample from which the most can be learned.<sup>9</sup> First step, the CHCs were grouped on the basis of rural and urban area. The distinction between urban and rural areas was determined at first because of the socioeconomic differences between the areas, which may affect the work processes variation and differentiation of the objects under study.<sup>10</sup> Second step, the CHCs were selected on the basis of target sample criteria. Dental professionals (dentists and dental nurses) were chosen as target sample because of their experience and competence in the work processes of SBDP. The criteria of selection was dentists or dental nurse who runs SBDP in the same CHC at least five-years to ensure that each participant understood the workprocess of the programme. Other consideration on the selection of CHCs was the availability of yearly reports and activity records from the last two years. Size of the sample was considered finalized at the point of saturation.<sup>11</sup> This is the point at which no new

concepts emerge from reviewing of successive data from a theoretically sensitive sample of participants. Finally, twelve CHCs which responded and matched with the criteria were then included in this study (2 CHCs from Kulon Progo, 2 CHCs from Yogyakarta city, 2 CHCs from Sleman and 3 CHCs from Gunung Kidul and 3 CHCs from Bantul).

Yearly reports and activity records from these twelve CHCs were reviewed in terms of work processes and possible constraints in program implementation. The review of the CHCs' reports was based on the four categories of procedures from the SBDP manual: resources and logistics, including human resources, budget, materials, and facilities; action plans, including a situational analysis of the area based on epidemiological data, problem formulation, problem solutions, and resources distribution; achievement of targets; and monitoring and evaluation. Issues emerging from these four themes became the basis for the in-depth interviews aimed at eliciting explanations for problems in the execution of the SBDP in each CHC. Specifically, potential solutions suggested by respondents were also discussed in the interview.

In developing guidelines for conducting the in-depth interview, Kvale's principles were employed to keep the original vision of the study. The purpose of the interviews, the questioning technique, and the strategy for data analysis were determined in advance.<sup>12</sup> The interviews took place in each CHC. The data from each interviewee were handled separately. The interviews were semi-structured, but open discussion was encouraged. In each interview the interviewer (RA) began with an introduction, encouraged discussion, avoided being placed in the role of expert, and made a summary. The interview lasted between 90 and 150 minutes. An audio recorder was used in each session to preserve the actual words spoken. An assistant was present to help with recording and data handling during the interview. Data were kept confidential after analysis.

A verbatim transcript was produced of each interview, reflecting the session and using the participants' own words which were then analyzed by manual thematic analysis. Thematic analysis is a research method which pays attention to the qualitative aspects of the material analysed through the systematic classification process of coding and identifying themes and patterns emerging from the transcribed text.<sup>13</sup> The analysis followed the theory of Fereday *et al.*<sup>14</sup> The first step in the data analysis was reading all data repeatedly to achieve immersion and obtain a sense of the whole and identify themes. After this, data were read word-by-word, adding codes to note patterns in the data and relate them to themes. Labelling these patterns was designed to allow distinctions to be drawn and research question to be answered. Each relevant expression was classified and coded for every aspect of the limitations in SBDP performance presented. Emphasis was put on elucidating areas of thematic importance and exploring major constraints in the work processes of the SBDP as perceived by dental staff. Codes then were sorted into categories based on relationships between the different

codes. Comparable explanations were combined under a single code. To improve reliability, these coded findings were then discussed with the research team in order to arrive at consensus on interpretation.<sup>15</sup>

Written permission from all participants was obtained prior to the start of the interview. Ethical approval was obtained from the Ethical Committee of the Faculty of Dentistry, Gadjah Mada University, Yogyakarta, Indonesia. Permission for the study was granted by various government offices both on the district and the provincial level.

## RESULTS

Among 41 respondents, 16 were dentists and 25 were dental nurses. Subjects were 17 percent male and 83 percent female. Average work experience was 10 years for dentists and 13 years for dental nurses. Number of dentist and its working experience in each district is in table 1. Four categories, each related to sub categories were

**Table 1.** Respondents characteristics

Districts	Average work experience (in year)	
	Dental nurse	Dentist
Bantul	10.9	7.2
Kulon Progo	18	19.5
Sleman	10.5	11
Yogyakarta City	16.7	6
Gunung Kidul	7.8	11

**Table 2.** Perceptions of dental staff regarding constraints in the school-based dental programme

Themes	Major Issues
Resources and logistics	Shortage of dental staff comparing with burden task Insufficient programme budget Scarce material for prevention Strict regulation in resource allocation
Programme planning	Unfamiliar procedure Deficient training in programme management Low priority for dental health in the CHC level Limited use of epidemiological survey
Target achievement	Limited time to go to schools Poor links to parents Unclear financing scheme on referral Policy curatively oriented Unclear target on dental status or behaviour changes from DHO Poor socioeconomic circumstances
Monitoring and evaluation	Ineffective means for evaluation at CHC level Poor feedback from DHO Lack of integrated information system

generated in the analytical process, which is presented in diagram in table 2. In general, dentists and dental nurses in Yogyakarta Province face similar problems, which imply on the consequence that there is no specific condition that could be determined as a basis for differentiation per district. Barriers of program implementation in rural area was complicated by the socioeconomic condition including poverty, distance and lack of transportation which affect on access to health care.

Generally speaking, the respondents noted that the number of dentists and dental nurses in Yogyakarta Province both in urban and rural area did meet the national standard. The tasks of providing treatment in the CHC dental clinic, together with community activities like the SBDP, were hard to manage.

The respondents indicated shortages in the budget to run the program. One dentist explained that the limitations of the budget made some activities hard to carry out, for instance, training teachers about dental health, and conducting meetings to foster cooperation with the education office or the parents. The budget available for the program was only sufficient for administrative purposes such as paper or book procurement for recording these activities. They also indicated their limited ability to manage the resources at the CHC level, because decisions over resource allocation per CHC program came from the District Health Office (DHO). The regulation of resources was strict, which made it impossible to use excess funds from other CHC health programs for the SBDP. The interviews showed a sense that dentists and dental nurses were dissatisfied with the resources available and desired procedures to make flexible allocation between programs possible. One dentist phrased it as follows:

The respondents indicated the material support provided in the CHC's dental clinic for dental care was mostly for curative treatment while the materials for prevention were scarce. This led to curative-oriented treatment, while preventive treatment for caries such as fissure sealant or topical application was neglected. One dental nurse related the problems providing prevention treatment to that of resources as follows:

"I understand that efforts in controlling caries will be effective if we provide preventive care like fissure sealant or topical application for those who are not affected or just have an initial lesion. But for years... even since I began work here for the first time... eight years ago... it was absent. If the materials are missing, we cannot offer this treatment to children. Our focus now is on clinical treatment or acute problems."

Dentists and dental nurses agreed that unfamiliarity with the SBDP manual made them produce a plan of action (POA) in their own format. Their POA usually only consisted of the number of schools to be served and a time schedule instead of a complete planning program based on a situational analysis of the area that was, in

turn, based on epidemiological data, problem formulation, problem solutions, and resources distribution. They also mentioned a lack of skills and knowledge regarding program management as being a constraint. There had been no training in public health, especially dental public health, before they started work in the community health centers, which was a constraint on developing a successful planning for the program. One dentist phrased it as follows:

"...after starting to work in the CHC, we have had to manage the program without any training first. It was hard because we knew little about SBDP management or organization. The last SBDP manual was published more than 10 years ago and the book was nowhere to be found..."

A dental nurse mentioned that, although they had the task of undertaking an epidemiological survey, they seldom did so, since existing data were only barely taken into consideration in the planning of the program. A schedule for screening and referral was considered sufficient for running the program. One dental nurse mentioned that other health programs had a higher priority than dental health. This was reflected in meetings held to discuss the program planning of every unit in the CHC. Time allocated for discussing the dental program was limited, since other health programs were considered more urgent. Therefore, this situation led to difficulties in communicating effective plans.

"There are many health programs that must be prioritized, such as dengue, tuberculosis, nutrition, and maternity. Discussing program planning in CHCs sometimes consumes a lot of time and we do not feel comfortable in speaking up for the school-based dental program. Dental disease never causes death, does it?"

Participants from disadvantaged locations mentioned poverty and difficulties with transportation as constraints for compliance with referral after screening. Another constraint in the achievement of targets was the role of parents. They play an important role in the SBDP, because the results of the screening are collected by the teacher and handed over to the parents. One dental nurse from a rural area explained that parent committees rarely discussed the school health program, since they considered this a task for the CHC.

"Only a few parents who live near the CHC or have enough money will bring their children to the CHC. Disadvantage geographic area and lack of transportation still become a problem. Yes, we do the screening, but without parents' participation; that is a problem. I was once involved in the parents' committee discussion, but they care more about computers or books than oral health. They considered it a CHC task."

Another important constraint expressed by a dentist was the limited time for visiting schools, since they have

a large number of patients in the dental clinic to treat and also have tasks in other programs such as the mother and toddler program. Time constraints also have an impact on dental personnel doing administrative work such as baseline surveys, reporting, and recording. One dental nurse said that the standard form for dental screening provided by the Ministry of Health was complex and took time to complete. Therefore, they recorded only children with positive screening, generally for caries disease and prolonged primary teeth retention, who were then given a referral letter.

“I cannot leave the clinic easily because many patients come everyday. Therefore, I have a dedicated time just for screening at least once a year. This CHC has to serve more than twenty schools. We also have to run community programs in more than 30 villages. The clinic would be closed then and people would complain.” –Dentist

“The form is complex. It includes many oral malfunctions and malformations. When I visit schools, I have to serve about 200 children in each school. I also have to deliver dental health education after screening –when can I do the recording? I cannot do everything at once.” – Dental nurse

Respondents mentioned that the data required for the annual reports mostly concerned curative interventions such as filling and extracting on referral, which discouraged preventive efforts in the SBDP. One dentist mentioned that the format of the annual reports also did not require comparison of program outcomes with those of the previous year, explaining why the CHCs lacked progress reports:

“The school-based dental program was always interpreted as a screening, filling, and extracting program. That is because the report to the DHO only asked for that. If we do screening at least once a year, the program is considered done. We don’t have the burden of considering changes to status or behavior.”

Respondents claimed that the lack of a specific department with responsibility for oral health after the decentralization of health services in 2001 was a constraint on SBDP monitoring and evaluation. No attention was paid to oral health, resulting in ineffective monitoring and evaluation. One dentist stressed that developing a clear blueprint for the roles and responsibilities of the oral health sector might help improve services. A lack of any formal approval by the DHO discouraged improvement of the programs. Another dentist highlighted the absence of an integrated information system in the District Health Office as a crucial factor in the evaluation system, because referred children could also be treated in private practice.

“The District Health Office never requests anything from this program. It has never been evaluated and never monitored. Even if the coverage of the

program were zero, they would not bother. We want the District Health Office to reorganize the program.”–Dentist

“The lack of an integrated information system in the District Health Office makes us difficult to track the status of children after getting referral letter. It is because children could also get care from private practice. If the system exist then we will know how many children get referral treatment outside the CHC.” –Dentist

Then, some respondents shared ideas for improving the target achievement of the program. A dentist who was not able to carry out program activities routinely in all schools mentioned the possibility of delegating some tasks to school teachers, for instance, demonstrating tooth-brushing, administering simple medication, and identifying and referring children with oral problems to the CHC. Another respondent stated that the CHC had previously circumvented the referral barrier by administering treatment – such as extraction of persistent deciduous teeth, ART fillings, and medication for dental pain – in schools directly after screening. This strategy was no longer possible, because the government had launched new regulations on medical practice in 2004 which forbade all medical services outside formal health facilities. A dental nurse in an urban area mentioned a school health insurance plan which improved referral compliance. It increased the willingness of parents to send their children for dental treatment to a CHC:

“There are many parents who don’t really care about dental health. Most parents of low socioeconomic status objected to paying for the treatment. However, since all schools in our catchment area manage school health insurance, referral compliance here is actually quite high. This system really works in overcoming that problem.”

In the interview, a majority of the respondents expressed positive opinions about prevention. They did not consider filling and extracting to be caries-preventing activities. Respondents also agreed that prevention yields a sustained improvement in the oral health status of children and minimizes the risk of dental problems in the future. The respondents also expressed the fact that delivering preventive services to children was preferable. One dentist expressed this as follows:

“Children will get more lasting benefit if the target to be achieved applies the principle of real prevention rather than just filling and extracting. It’s like waiting for the disease to come and then fixing it. The classic problem is resources and facilities. We have no choice because no preventive treatment is available in the CHC, so we cannot refer children for prevention. Reorientation towards prevention should be started, and we really support it.”

The respondents agree that an emphasis on prevention would be a challenge for the SBDP, since the existing policy is curative oriented. Most respondents highlighted the role of the District Health Office in influencing their activities in terms of delivering health services. They agreed that the DHO should begin a reorientation of services towards prevention, and provide adequate resources and facilities.

## DISCUSSION

This study has provided some information about the constraints on the work process of the SBDP as experienced by dental staff. Dental staff in the five districts faced similar problems as SBDP is a national program which routinely carried out in all over CHC in a standard format. Significant constraints were identified in each of the four categories: resources and logistics, program planning, target achievement, and monitoring and evaluation. The constraints found were limited resources and inflexible regulation of resource allocation in the CHC. Inadequate program planning and program evaluation is a weakness in the management process. This situation is worsen because of the limited time for visiting schools and low parental cooperation. Despite the national guidelines and the SBDP manual, the policy at the district level orientates dental health towards more curative intervention rather than prevention. Suggestions were made regarding task delegation, improving procedures for small curative interventions in schools, funding programs through school health insurance, and reorientation towards preventive treatment in the schools.

Concerning resources, dentists and dental nurses both in urban and rural area face pressures in terms of time allocation in balancing their obligations to treat patients in the clinic and their task of serving out in the community. Therefore, it appears that in practice, human resources in the oral health sector are insufficient despite the fact that the number of dentists and dental nurses are theoretically in compliance with the standard. Moreover, there is an insufficient budget to finance the program completely. An inadequate workforce together with a lack of resources is also recognized in other public health programs as a classic problem in developing countries.<sup>16</sup> However, this finding indicates the need to reassess the resource allocation for the oral health sector, adjusted to the actual need to develop a successful program.

Poor program planning is identified as a constraint on the work process. The majority of respondents agreed that the skills for analyzing and planning SBDP activities were limited. This could be what leads dentists to continue to implement the program without considering what is actually needed to deal with current children's dental health problems. This is in line with a study in developing countries suggesting that effective public health programs need skills in analysis and planning.<sup>17</sup> Setting a practical, feasible, and evidence-based plan has to be based on objective

information about the situation rather than on subjective impressions. It is suggested that dental personnel should be encouraged and trained to produce realistic and qualified planning reports as tools for program improvement.

The majority of respondents mentioned that a low response on referral was mostly generated by poor relationships with parents. It was explained further that the poor cooperation of parents was enhanced by the fee-based mechanism of referral payment. This is in line with a study which mentioned that access to care is determined largely by individual's ability to pay.<sup>18</sup> Therefore, a mechanism for financing should be considered carefully. A financing mechanism for referral, making use of school health insurance as suggested by one of the dentists interviewed, could intensify this problem if it is only aimed at curative treatment for dental disease. This could generate dependency on professionals and move the program away from prevention.<sup>19</sup> The important thing that emerged from this study concerning achievement of target was the socioeconomic inequality between CHCs in urban and rural area, which affected on the awareness to visit dental care. It seemed here that rural children at a greater risk of poor oral health outcomes. The optimization of available resources was experienced by a study the Philippines, could become an important discourse.<sup>20</sup> Reactivation of good oral health behaviour in school by promoting oral health supported by healthy environment in school and good connections with parents may also become an initial step for tackling the boundaries.<sup>21</sup>

The curative orientation which was blamed as one of the causes of increasing caries is common in developing countries and indicated as the most significant barriers in reducing caries in children.<sup>22</sup> Achieving oral health, which should be the goal, should not be meant as oral treatment. In a situation like Yogyakarta, where the caries level remains quite high, the combination of curative and preventive care for those who suffer from caries, and prevention care for those who are free of caries, is the best choice for providing oral health care.

In accordance with the program of monitoring and evaluation, it appears that dental staff experienced deficient monitoring and poor reporting compliance even at the CHC level itself. Most of the respondents agreed that the major constraints were the scant attention paid to dental health by the DHO. It is common that limited health-system resources leads governments to concentrate on a few high-priority items.<sup>23</sup> However, it should be noted that globally, dental caries shows a trend towards being on the increase in the years to come and therefore the DHO as regulator needs to make some improvements in various important technical aspects.<sup>24</sup> Furthermore, neglecting the oral health program will negatively affect the motivation and performance of dental staff in the CHC. Supportive supervision from the DHO is critical in strengthening and enhancing performance in primary health facilities.<sup>25</sup> Cooperation with private practice in developing an integrated oral health information system in

the district could be considered. A feasible computerized system could prove effective in supporting the monitoring capacity.<sup>26</sup> However, it should be noted that the end result of the system should not just be providing data but using that data to provide information for decision-making aimed at improving the oral health program.

Despite the weaknesses and constraints found, there is a positive side regarding school-based dental programs in Yogyakarta. This system is an established program supported by a national policy for screening the oral health of the children on a regular basis, which ensures that children have contact with a dental service. In this study, dentists and dental nurses also showed that they were in favor of dental prevention. The absence of preventive treatment is triggered more by conditions such as material and equipment shortages than by their attitudes. The importance of this finding is that reorientation toward prevention could be successful, if it is supported at all levels by the CHC staff, the District Health Office, and the Ministry of Health.

The results of this study provide the decision-maker in dental health policy with information for developing strategies to improve SBDP. In order to implement an effective and efficient program policy for oral health, assessing the constraints on the program through the experience of dental staff is a necessary step. This qualitative study provides a better understanding of the context and personal experiences in the day-to-day processes of the SBDP. However, some limitations in this study have to be taken into account. The study was based on qualitative data that might be a limitation as the findings only provide hypotheses of deficiencies, but this information can be a useful information in disease specific program like SBDP. Bias reporting may have confounded some of the responses, but previous studies report similar issues suggesting that the results are externally valid.<sup>27</sup> The findings in this study may be generalizable to other CHCs in Yogyakarta due to similar health system infrastructures, socio-cultural environments, and topography.

Optimizing all available resources and implementing efficient work might be the most recommendable, since obtaining more resources from the District Health Office cannot realistically be expected. For instance, one study has shown that the delegation of basic community oral health services such as dental education or emergency care to other health professionals in the CHCs can help dentists and dental nurses improve the program.<sup>28</sup> However, this delegation should be supervised by a dental professional in order to maintain quality. Regulation that forbids all clinical services outside formal health facilities is also unfavorable in terms of optimizing resources. It is recommended that an exception should be made for certain treatment with low risk for complications, such as extraction of primary prolonged teeth and filling with atraumatic restoration treatment (ART), with concern on preventing cross-infection. The participation of parents is particularly important to ensure

that the oral health education for children are addressed adequately and effectively.

Beside clinical prevention, effort on community prevention level could be implemented with consideration on practicable effort like water quality improvement or fluoride mouth rinsing and the use of fluoridated toothpaste in school. These methods have been proven to be more cost-effective than professional application and could be equally distributed to all children.<sup>29</sup> Clear guidelines of dental health strategy to enhance preventive effort should be developed in terms of a broad strategy on oral health prevention and promotion. However, further research is also required to assess the oral health outcome of the SBDP including oral health status and behaviour of the children, in order to evaluate the existing strategy.

In conclusion, the school-based dental program in Yogyakarta is carried out with weak management processes, low support from parents, and a curative orientation with little priority for oral health at district level. These shortcomings are one explanation for the failure to be successful in controlling caries, despite the continuing efforts being made. This study could serve as a basis for developing recommendations that would be valuable for future SBDP work.

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