Oral Health Outreach Programs - Can they Address the Disparities in Access to Dental Care?

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ABSTRACT

Objective: This study examines the potential of an oral health outreach program (SCOPE) in addressing disparities in access to dental care.

Material & Method: The extent to which underserved communities represent SCOPE’s patient population and the type and quantity of care delivered were examined. Work records of fourth year dental students were analyzed to compute the proportion of under-18, elderly, African-Americans, Hispanics, those on public insurance, and uninsured individuals in the program’s patient population.

Results: The insurance-mix of SCOPE’s patients was compared with the nationally representative sample of dental patients. Compared with the local communities and the nationally representative sample of dental patients; African-Americans, Hispanics, the uninsured, those on state insurance and children were over-represented in SCOPE’s patient population.

Conclusion: Oral health outreach programs run by academic dental institutions have the potential to address disparities in access to dental care. Rotating dental students through community-based clinics increases the availability of inexpensive dental professionals in the community.

KEY WORDS: Healthcare disparities, Health services accessibility, Access to care, Oral health, Minority health, Community-based education, Oral health outreach programs.

INTRODUCTION

In 2000, Oral Health in America: A Report of the Surgeon General documented the relationship between oral health and overall health (1). More importantly, the report identified disparities in oral health that can be linked to disparities in access to dental care. While many Americans have access to state-of-the-art dental care, many communities do not receive even the basic services. Factors associated with inadequate utilization of dental care include low income (2), living in socioeconomically disadvantaged neighborhoods (3), belonging to racial or ethnic minorities (2, 4-7), lack of dental insurance (7-9), disability and living in rural and inner city communities (10-12). Disparities in access to care are magnified for the elderly (7, 13) primarily due to immobility. Consequently, underserved populations have high unmet need for dental care.

The effect of these disparities on children and adolescents is even greater owing to a greater need for dental care in these populations. In addition, lack of access to preventive dental care is leading to increased need for further treatment, as evidenced by the increasing rate of dental caries. Since the surgeon general’s report, the car-
ies prevalence for children 2 - 11 years old has increased by 5% (from 40% in 1988-94 to 42% in 1999-2004) (14). Among 2-5 years-olds, prevalence of dental caries in the primary dentition has increased by almost 17% (from 24% in 1988-1994 to 28% in 1999-2004)(14). Caries in young children is especially problematic because of early-onset, chronic and cumulative nature of the disease.

Disparities in access to dental care exist primarily due to the differences in individuals’ ability to pay for expensive dental care and geographical variation in dentist-population ratio. Several states have taken steps to reduce the disparity in paying capacity through various public insurance programs including Medical Assistance (Medicaid) and the Children’s Health Insurance Program (15). However, these programs have met with qualified success (8) due to low reimbursement rates and consequently low dentist participation rates (16). In addition, the underserved communities, by definition, have an unfavorable dentist to population ratio (17). These communities therefore lack adequate access to dental care even when some federal and state insurance is available. The National Health Services Corps Student Loan Repayment Program is a major federal effort aimed at reducing scarcity of dental health professionals in the underserved areas (18). Although this program has met with some success, the inadequate access to the uninsured and those on state insurance continues to be a major challenge in improving oral health of the Americans.

As safety-net providers, academic dental institutions are critical in reducing disparities. However, the safety-net provision is effective in areas where dental schools are likely to be located. In response, academic dental centers are increasingly collaborating with community-based clinics to bring accessible dental care to small towns and rural communities. As part of the training, many dental schools require students to earn some experience in delivering dental care in non-hospital settings. The goal of this arrangement is to expose students to community-based settings to foster cultural competency skills and to promote an interest in serving in community settings. Another goal is to improve access to dental care for the underserved by providing additional professional workforce to the clinics in the underserved areas. Towards these ends, the University of Pittsburgh, School of Dental Medicine runs an outreach program called the Student Community Outreach Program and Education (SCOPE).

This study examines SCOPE’s potential in addressing disparities in access to dental care. Specifically, we examined the type and quantity of dental procedures students delivered in the community setting. Furthermore, we examined the extent to which SCOPE’s patient population represented the underserved (African-Americans, Hispanics, children, elderly, uninsured and those with state insurance). Last, we examined if the actual dental care received by children and adolescents reflected the higher prevalence of dental caries in this group.

THE PROGRAM

SCOPE is a two-part program. SCOPE I is designed to give pre-clinical dental students valuable experience in community service. Fifty hours of participation in non-dental community projects during the first two years of dental school develops cultural competency in the students and helps serve the needs of the community (19, 20). SCOPE II, the clinical phase of the program, was developed in 2000 and it has grown to serve many sites throughout western Pennsylvania. SCOPE II’s education/delivery model is comparable to the Robert Wood Johnson Foundation’s (RWJF) Pipeline, Profession, and Practice: Community-Based Dental Education national program (21). SCOPE II (referred to as SCOPE hereafter) is currently funded under a grant from U.S. Department of Health and Human Services’ Health Resources and Services Administration. The goal is to give students valuable clinical training and experience in helping underserved populations while enhancing the clinic’s ability to provide necessary dental care to their communities. In 2012, SCOPE was made a required course for graduation. Compared with the Dental Pipeline program, SCOPE operates on a smaller scale. There are 16 community-based dental clinics affiliated with SCOPE while the schools participating in the dental pipeline program were affiliated with 21 clinics on average (22). In 2012, seventy six fourth-year dental
students spent 10 days in one of the outreach clinics. In comparison, the Dental Pipeline school students spent 50 days in community clinics (22). The majority of the SCOPE sites (11) are Federally Qualified Health Centers (FQHCs). Two sites are hospital-based clinics and three sites are not-for-profit clinics. Only one SCOPE site is a private dental practice. The outreach locations span western Pennsylvania with two sites in the neighboring state of Ohio (Youngstown). Outreach sites in Pennsylvania are located in Erie, Conneautville, Oil City, Rochester, New Kennsington, Burgettsown, Uniontown, Altoona (2 sites) and Pittsburgh (5 sites). Figure 1 presents the distribution of the outreach sites across western Pennsylvania and Ohio. Students were reimbursed for housing and transportation expenses.

METHODS
This study was conducted in accordance with the rules of the Declaration of Helsinki of 1975, revised in 2008. The study was reviewed and approved by the University of Pittsburgh Institutional Review Board (PRO13090132). Data Collection: This study is a secondary data analysis of students’ work records. All dental students maintain a record of the procedures they perform at the outreach clinics. These records include, for each student-patient encounter: patient’s age, race, ethnicity, gender, patient’s insurance status, and the type and quantity of procedure performed. Students do not record patient’s names since these are not relevant to record keeping for academic evaluation. At the end of their posting, students appended their work record into a common dataset. An Excel® spreadsheet was made available to the students on the dental school’s online course management system. Students’ names were not recorded in the dataset for confidentiality reasons.

Data Analysis: All analysis was conducted using STATA® 12.1 (StataCorp, College Station, TX) and Microsoft Excel® (2010). First, we conducted descriptive analysis of the type and quantity of dental care delivered by the students. Next, we computed the proportion of under-18, elderly, African-Americans, Hispanics, those on state insurance, and the uninsured in SCOPE’s patient population. We compared the insurance-mix (private insurance, state insurance, uninsured) of SCOPE’s patient population with the nationally representative sample of dental patients in 2011 (Medical Expenditure Panel Survey- MEPS 2011 Dental Utilization File) (23). We also compared the distribution of under-18, elderly and African-Americans and Hispanics in the SCOPE’s patient population with the local communities where the outreach sites were located. Demographic information for individual communities was obtained from the U.S. Census Bureau (24). Last, we conducted Pearson’s Chi Squared Test to examine if the under-18 received more restorative and caries-preventive procedures.

RESULTS
Dental procedures: Overall 3,984 dental procedures were performed during the academic year. This amounts to 5.3 procedures per day per student. A wide range of prophylactic, periodontal, restorative, endodontic, and oral surgical procedures were performed. Prosthodontic procedures however were limited to complete dentures (only 2 were fabricated). Table 1 presents the type and quantity of dental procedure performed.

Patients: Overall the 4th year dental students delivered care to 2,411 patients. The median age of patients was 34 years with more than half (55%) of the patients being female. Figure 2 compares the insurance status of SCOPE’s patients with the nationally representative sample.

Ninety percent of SCOPE’s patients were either on public insurance or were uninsured compared to only

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Table 1: Type and quantity of each dental procedure performed

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis and Treatment Planning</td>
<td>561</td>
</tr>
<tr>
<td>Oral Prophylaxis</td>
<td>364</td>
</tr>
<tr>
<td>Root Planing</td>
<td>86</td>
</tr>
<tr>
<td>Sealants</td>
<td>37</td>
</tr>
<tr>
<td>Anterior Teeth Resorted</td>
<td>464</td>
</tr>
<tr>
<td>Posterior Teeth Restored</td>
<td>1702</td>
</tr>
<tr>
<td>Endodontic Therapy</td>
<td>50</td>
</tr>
<tr>
<td>Relief of pain and sepsis</td>
<td>60</td>
</tr>
<tr>
<td>Extractions</td>
<td>657</td>
</tr>
<tr>
<td>Complete Dentures</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 2: Proportion of uninsured patients, patients with private & public insurance (SCOPE vs. MEPS)
Almost half of all patients 65 years and older were uninsured and a quarter of elderly patients were on Medical Assistance.

**DISCUSSION**

In our knowledge, this is the first study to examine the potential of a dental outreach program in reducing disparities in access to dental care. We tried to answer several questions with our analysis: a) Did SCOPE provide routine dental care that majority of people need? b) Did SCOPE increase utilization of dental care by the underserved (uninsured, underinsured, racial and ethnic minorities, and elderly)? c) Did SCOPE provide appropriate care to those who are at high risk of caries (children and adolescents)?

Our results indicate that a wide range of routine dental procedures were performed at the outreach clinics by the students. Routine dental procedures account for dental care needs of majority of patients. The only exception was prosthetic procedures that were limited to complete dentures of which only two were fabricated. There are several possible explanations. First, the amount of time students spend in the outreach clinics is not sufficient to initiate and complete longer procedures that require multiple visits typical of prosthetic procedures. Second, substantial laboratory costs of prostheses fabrication may prohibit clinics from providing dental prostheses to a large number of patients with limited paying capacity (uninsured or on state insurance). We cannot confirm this with our current data but it is a possibility that the clinic preceptors were able to deliver more dental prostheses when students shared their burden of routine dental procedures.

**Table 2: Likelihood that children and adolescents will receive selected dental procedures compared to adult patients**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Odds Ratio</th>
<th>Pearson’s Coefficient</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class One Amalgam Restoration</td>
<td>1.66</td>
<td>13.41</td>
<td>0.000</td>
</tr>
<tr>
<td>Posterior Composite Restoration</td>
<td>1.65</td>
<td>18.89</td>
<td>0.000</td>
</tr>
<tr>
<td>Oral prophylaxis</td>
<td>5.88</td>
<td>234.9</td>
<td>0.000</td>
</tr>
</tbody>
</table>

mAfrican Americans and Hispanics were over-represented in SCOPE’s patient population when compared to the communities served by the outreach sites. Since African Americans and Hispanics tend to utilize fewer dental services compared to rest of the population, these groups are generally under-represented as dental patients. The fact that these groups were over-represented in the SCOPE’s patient
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by Coleman (25), dental students could
dental collaborative model suggested
this group. In addition to the nursing-
disparities in access to dental care for
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frail and the institutionalized is likely
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population suggests that SCOPE is
effectively targeting these groups.

Patients younger than 18 years, a
group that typically shoulders great-
est burden of dental caries, was also
over-represented in SCOPE’s patient
population. Almost three-fourths of
all dental care for this group was
paid through Medical Assistance. As
previously discussed, having state
or federal dental insurance does not
ensure access to dental care because
dentist participation in these programs
is poor owing to low reimbursement
rates. Consequently, children on state
dental insurance have only slightly
better access to dental care than the
uninsured. FQHCs, with limited man-
power, cannot cater to all the dental
needs of the underserved. By placing
dental students within the FQHCs,
outreach programs like SCOPE have
the potential to bridge the “manpower
chasm” and complement public insur-
ce programs in improving access to
dental care for children and adoles-
cents. Compared with adults, children
and adolescents were more likely to
receive restorative and prophylactic
procedures; reflecting the dental care
needs of this group. SCOPE’s delivery
model thus facilitates early interception
of caries and can potentially reduce the
loss of tooth structure in the long term.
One group that did not benefit from
SCOPE was the elderly. Compared
to their presence in the community,
elderly were under-represented in
SCOPE’s patient population. One
possible explanation is mobility issues
in the elderly. Coleman justifies a nurs-
ing-dental collaboration to meet oral
healthcare needs of the elderly because
these individuals are more likely to be
frail and residing in nursing homes (25).
As baby boomers age, the number of
frail and the institutionalized is likely
to increase, potentially worsening the
disparities in access to dental care for
this group. In addition to the nursing-
dental collaborative model suggested
by Coleman (25), dental students could
rotate through assisted living and
nursing facilities to deliver care to the
elderly and potentially develop an
interest in geriatric dentistry.

There is consensus among the key
stakeholders including leaders of aca-
demic dental institutions, state dental
societies, state department of health,
and policy makers; that providers and
recipients of dental care can mutually
benefit under the community-based
learning model (26). Yet, while 51 out
of 58 dental schools rotate students
through outreach clinics, the median
number of days students spend in the
community setting is ten days (27).
Dental students need to spend much
more time in the underserved
communities for any measurable impact
on their dental care utilization. One
barrier to large scale implementation of
outreach programs is that the revenue
generated by the dental students at the
outreach sites is generally not shared
with the dental schools. Bailit and col-
leagues estimated that if students spend
70% of their clinical time in communi-
ity-based settings the savings in clinical
operating expenses will outweigh the
loss of revenue (28). However, clinic
facilities involve huge capital invest-
ments. These sunk costs pose a major
challenge in moving towards a primar-
ily community-based learning model.
The disparity in access to dental care
(specially for children) and its impact
on oral health is an immediate and an
ongoing concern for policymakers.
Recommendations to address this issue
have primarily focused on new work-
force models including developing a
pediatric oral health therapist (29),
adding dental therapists to healthcare
teams (30), and educating primary
care physicians and pediatricians in
children’s oral health. However,
these models do not address the geo-
ographical disparity in access to care.
Well-designed outreach programs, on
the other hand, can potentially help
address the disparity in access to dental
care rapidly.

This study has several limitations.

First, while our results indicate that
the underserved groups were over-rep-
sented in the SCOPE’s patient popu-
lation, we cannot determine whether
the program actually improved access
for these groups relative to their
dental care needs. Second, we cannot
determine SCOPE’s impact on overall
productivity of the community clinics.
Since dental students work under the
supervision of a preceptor, the number
of patients that the preceptor can see
may be reduced. However, results of
the Dental Pipeline program indicate
that the community clinic dentists can
adequately supervise students while
managing a regular patient load (28).
Third, our analysis implicitly assumed
that the clinic users can be compared to
the demographics of the entire commu-
nity where they are located. In reality,
the clinics probably draw patients from
only a limited geographic area within
each community. This is an area for
further study using geographic indica-
tors of patient origin.

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