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Programs and Policies Targeted to Improve Access to Dental Care for Low Income Adults and Children in the US: An Integrative Literature Review

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Abstract

Objective: The authors conducted an integrative literature review of recent studies that explored the impact of interventions implemented in the U.S. that focused on improving access to dental care for low-income and vulnerable populations.

Methods: The authors conducted an integrative literature review of studies published between 2012-2018 that addressed six oral health policy spheres. 1) Community-based dental access programs; (2) Medicaid reimbursement and expansion; (3) Student loan support; (4) Oral health services in non-traditional settings and dental residency programs; (5) Programs to improve oral health literacy; and (6) Use of dental therapists.

Results: The authors included 39 articles for qualitative synthesis. Numerous public health initiatives and programs exist in the US aimed at increasing access to quality oral health care. Medicaid expansion, increased Medicaid fee-for-service reimbursement rates, and state loan repayment programs have demonstrated some success in improving access among underserved populations. A diversified dental workforce, with community dental health workers and mid-level providers like dental therapists, as well as inter-professional training of nurses and primary-care physicians in oral health have also shown positive impacts in advancing health equity. Further studies are needed to understand how oral health literacy programs can affect access and utilization of dental services.

Conclusions: Improvements to the oral health care safety net will require a holistic and multifaceted approach in order to reduce oral health disparities. Policy levers should work, not in isolation, but rather in complementary fashion to one another.

Keywords: Oral health; Dental care access; Oral health care policy; Health disparities

Introduction

Good oral health is critical to maintaining good general health and well-being. The Surgeon General's Oral Health Report concluded that "although common dental diseases are preventable, not all members of society are informed about or able to avail themselves of appropriate oral-health promoting measures" [1,2]. Among those that have the most challenges in accessing care are children, pregnant women, older adults, people with special needs, and low-income individuals. Individuals living in rural and urban underserved areas also experience difficulties in accessing care, as do the homeless [3]. These groups face a multitude of economic, structural, and geographic barriers that affect the ability to access quality oral health care and navigate the oral health care system. Such barriers include but are not limited to the high cost of dental services, lack of dental insurance, the geographic shortage or maldistribution of dentists [4], low oral health literacy, transportation or mobility issues, and underestimation of the need for preventive dental care [4,5].

Nationwide, states have implemented a number of public health initiatives and oral health safety net programs to improve access and quality of care. The range and breadth of these policies speaks to the complexity of the problem. This literature review examines a range of oral health policies and programs employed throughout the U.S. that are intended to reduce disparities and improve oral health indicators.

We conducted an integrative literature review of studies published between 2012-2018 [6], that have explored the impact of interventions and reforms implemented throughout the U.S. to improve access to dental care for low-income and other at-risk populations. Our review focused on six policy spheres that have the potential to reduce access disparities: (1) Community-based public health dental access programs; (2) Medicaid reimbursement rates and Medicaid expansion; (3) Student loan support for newly licensed dentists; (4) Oral health services provided in non-traditional settings and dental residency programs; (5) Programs to improve oral health literacy; and (6) Authorization and use of dental therapists. Our review adds to the current evidence base by analyzing programs and policy initiatives that have shown promise or seen success in recent

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years.

Methods

Using the Scopus and PubMed electronic databases, we searched the peer-reviewed literature published in English between 2012-2018 for papers that conformed to the study objectives [7,8]. Search terms included the following: dental care, patient navigator, community dental, community dental worker, health coordinator, loan repayment, residency program, oral health literacy, oral health education, Medicaid reimbursement, and dental therapist. We excluded articles published in any language other than English, articles that addressed dental care policies not utilized in the United States, non peer-reviewed and systematic review articles. Two independent reviewers (H.Z., O.K.) used the eligibility criteria to analyze the titles and abstracts, followed by the full texts for the step-wise selection of articles.

Results

We identified 3,007 articles from the initial electronic search and 16 articles from the manual citation search. We excluded 2,771 articles by screening the titles and abstracts using the study eligibility criteria. After removing duplicates, 252 articles were selected for full-text review of eligibility. Finally, 39 articles were selected for qualitative synthesis (See Table 1 for the studies included in in this integrative review literature review).

Innovations in community-based public health dental access programs

Our literature search identified multiple models of community-based workforce innovations using allied dental health workers with varying levels of training and expertise to increase access to care and utilization of dental services in low-income and vulnerable populations [9-12]. The Community Dental Health Coordinators (CDHCs) program was developed by the American Dental Association (ADA) to address oral health disparities in underserved rural, urban, and Native American communities [9]. CDHCs have been shown to be effective in providing oral health education and promotion, community outreach and engagement, case management, and patient navigation services to patients. Community health workers deployed to screen applicants, educate residents to adopt good oral hygiene practices, coordinate follow up care, and ensure that patients had transportation to appointments have been successful in diverting patients seeking urgent dental care in emergency departments to private practice providers or community dental clinics [10]. Another model employed an oral health nurse to coordinate services and oversee a school-based district-wide oral education and health promotion program that provided preventive services in schools, and intensive, restorative services for individual patients in need [11]. Although the long-term impact on oral health of the children was inconclusive at the end of the pilot, the program demonstrated that collaborations between school-based oral health programs and the community have the potential to reduce oral health disparities in populations with a high burden of dental disease [11]. Many states have also revised their dental practice acts to permit Registered Dental Hygienists (RDHs) to practice outside of the traditional dental office and the direct supervision of a dentist to provide a range of preventive oral health services in schools and community-based public health settings [12].

Policies related to medicaid reimbursement and expansion of dental coverage

Studies have shown that utilization rates and access to dental care is increased, particularly among publicly insured children, when Medicaid Fee-For-Service (FFS) reimbursement rates are adjusted closer to market levels [13,14]. Chalmers, et al. estimated that 1.8 million more children would have had access to dental care in 2014 if states with low reimbursement rates had raised their rates in 2013 [15]. Such increase is premised on the assumption that higher rates encourage provider participation which results in increased network capacity. Modest increases in regular dental care use and the subsequent cost savings associated with use – among Medicaid-enrolled children have also been attributed to reforms to state Medicaid programs, such as managed care carve-outs for dental services, better customer service, implementation of a missed appointment tracker, and expansion of the provider network [16,17]. Further, this expansion must be adjudicated using clinically meaningful metrics – such as the proportion of caseload attributable to Medicaid enrollees in order to see improvement in utilization numbers [18]. Disparities in oral health in children associated with socioeconomic and racial minority status may persist, even when reimbursement rate increases are implemented, unless the fundamental social determinants of health, such as housing and food insecurity, are addressed [19].

While several individual, provider, and system-level barriers were projected to hinder the effectiveness of expansion, states that opted to expand their Medicaid programs under the Affordable Care Act (ACA) to provide coverage beyond emergency services, saw a resultant increase in low-income adults receiving dental care [20]. Low-income adults residing in states with a non-emergency dental benefit also had a greater probability of having seen a dentist compared to low-income adults residing in states without such dental benefits [21].

Without access to preventive dental care, patients in urgent need of oral health care services increasingly seek treatment of dental conditions in hospital emergency departments [22]. Laniado et al. found that states that opted to expand Medicaid dental benefits to adults are likely to see reductions in the number of emergency department visits for preventable dental conditions, particularly in populations of young adults [22]. Conversely, the elimination of adult dental benefits resulted in a substantial increase in emergency departments visits by Medicaid enrolled adults for dental problems due to a decline in access to dental care in primary care settings [23]. In addition, significant differences across racial and socioeconomic groups in emergency department utilization for dental conditions have been noted [10,24]. An adult Medicaid dental benefit would allow adult Medicaid enrollees to access primary care through a dental provider, eliminate the necessity to seek routine medical care in hospital emergency departments, and begin to erode some of the racial and socio-economic disparities in poor populations.

Loan Support

Dental loan repayment programs vary in scope and size, ranging from total student loan forgiveness after a specified period of time to a fixed amount per year in exchange for dentists commitment to

Table 1: Studies included in the integrated literature review.

Study	Primary Intervention Assessed	Study Design	Sample/Study Population	Outcome measured	Principal Finding
Arthur & Rozier, 2016	Oral health services in non-traditional settings	Time series	Medicaid-enrolled children	Use of oral health services	Implementation of Medicaid reimbursement policies for non-traditional providers to administer preventive oral health services can improve access
Bailit & D'Adamo, 2012	Oral Health Education	Narrative review	-	-	Several states have promising programs to reduce disparities but most are still at the demonstration level and have not been adequately evaluated.
Batliner, 2016	Dental therapists	Narrative	-	-	The Dental Health Aide Therapists are a potential solution to dental access scarcity
Beazoglou et al., 2015	Medicaid reimbursement	Pre-post	Children enrolled in Medicaid	Dental care utilization	Increased Medicaid reimbursement rates for dental providers resulted in reduction of dental access disparities
Berdahl et al., 2016	-	Descriptive	Children aged 0-18	Dental care utilization	Access disparities were based on insurance status, race, income, educational attainment and overall health status
Bethel et al., 2014	Dental residency programs; Oral health services in non-traditional settings	Narrative	-	-	Offering oral health care services in alternative settings, such as senior centers, places that are familiar to older adults is a key strategy to increase access
Blue & Kaylor, 2016	Dental therapists	Cross-sectional	Four dental practices in Minnesota	Changes in dentists' practice patterns	Dentists performed fewer restorative and preventive procedures after a DT was hired.
Brickle et al., 2016	Dental therapists	Narrative	-	-	Preliminary findings are positive regarding the public health impact of Dental Therapists in Minnesota
Chalmers & Compton, 2017	Medicaid reimbursement	Cross-sectional	50 states and the District of Columbia	Access to dental care	Reimbursement rates and access to dental care were directly related at the state level
Chalmers, 2017	-	Cross-sectional	Maryland residents	ED utilization and costs	Dental/oral health-related conditions discharges are not evenly distributed by race
Dolce, 2014	Oral health services in non-traditional settings	Narrative	-	-	Inter-professional education is requisite to improving oral health care outcomes
Dudovitz et al., 2018	Community-based dental access programs	Longitudinal	Low-income urban children	Oral health status	A school-based universal screening and fluoride varnishing program can improve the oral health of children with a high burden of untreated dental diseases
Flynn et al., 2014	ACA, Medicaid expansion	Cross-sectional	Adult Medicaid enrollees	Receipt of timely dental care	The ACA will not reduce barriers to dental care for adult Medicaid enrollees.
Guo et al., 2014	Oral Health Literacy	Survey	Adults aged 25+ in rural Florida	Oral health status	Higher levels of health literacy were associated with better oral health status
Gupta et al., 2017	Medicaid reimbursement	Descriptive	All US states	Medicaid reimbursement rates	There is considerable variation across states in Medicaid fee-for-service reimbursement rates
Horowitz et al., 2015	Oral health education	Qualitative	Low-income parents	Knowledge and understanding of prevention and control of dental caries	Most participants had limited understanding of and extensive misinformation about how to prevent dental caries
Johnson et al., 2017	Loan support	Cross-sectional	Children aged ≤19 years	Cost-effectiveness of three preventative interventions	Loan repayment programs are potentially cost-saving interventions.
Kranz et al., 2014	Oral health services in non-traditional settings	Cross-sectional	Medicaid enrollees under three years old	Access to dental care	For young Medicaid enrollees, oral health services provided in medical offices can improve access and increase use
Laniado et al., 2017	Medicaid coverage	Pre-post	All individuals who presented to the ED with a dental problem	Number of NTDC visits	The increase in Medicaid dental benefits through the ACA significantly decreased NTDC visits
Lee et al., 2014	-	Cross-sectional	Adults 65 years or older	Dental care utilization	County-level dentist-to-population ratio has independent effects on older adults' dental care utilization
Li et al, 2018	-	Descriptive	Adults aged 20+ years	Self-reported oral health	Self-reported oral health improved from 1999 to 2014
Macek et al., 2016	Oral health education	Descriptive	Adult dental patients	Dental visits, oral health functioning, and dental self-efficacy	The relationship between health literacy and oral health is not straightforward, depending on patient characteristics
Maxey et al., 2017	Oral health services in non-traditional settings	Comparative case study	Primary care physicians at federally qualified health centers	Roles for physicians in oral health	Family physicians can contribute a great deal to the success of integrated health care delivery models
McKernan et al., 2015	Medicaid participation	Survey	General dentists in Iowa	Factors affecting Medicaid participation	Dentists who accepted Medicaid patients had more positive attitudes about Medicaid and altruistic attitudes
Nasseh & Vujicic, 2015	Medicaid reimbursement	Pre-post	Medicaid-eligible children in Connecticut, Maryland and Texas	Access to dental care	Increasing Medicaid dental fees closer to private insurance fee levels has a significant impact on dental care utilization

Nebeker et al., 2012	Medicaid	Cross-sectional	Dentists practicing in Michigan	Dentists' attitudes toward Medicaid and an alternative public dental insurance system in Michigan	Practitioners were more satisfied with the alternative public dental insurance program than they were with Medicaid
Pathman et al., 2012	Loan support	Descriptive	Clinicians serving in the NHSC's loan repayment programs	Changes in the disciplinary composition of the NHSC's workforce	With increased funding, the NHSC's workforce has become larger and more diverse
Phillips et al., 2016	Dental therapists	Cross-sectional	Adult patients and their waiting room companions	Patient-reported comfort with mid-level dental providers	Patients lacking regular care appear to be comfortable with the introduction of mid-level dental providers
Ramos-Gomez, 2014	Oral health services in non-traditional settings	Narrative	-	-	The Infant Oral Care Program could reduce disparities in oral health care access and disease among vulnerable populations
Rodriguez et al., 2013	Community dental health coordinators, dental therapists	Narrative	-	-	Mid-Level Dental Providers could increase access to care to underserved populations
Rowland et al., 2016	Community-based dental access programs	Time series	Maryland residents	Impact of community dental program	Effective ED dental diversion programs can result in cost savings and more appropriate care
Sen et al., 2016	Preventive dental visits	Retrospective cohort study	Low-income children	Use of restorative or emergency dental services	Dental sealants reduced the likelihood of using restorative and emergency services and costs
Shariff & Edelstein, 2016	Medicaid, access to care	Cross-sectional	Publicly and privately insured children	Oral health status, dental care use	Publicly insured children had poorer oral health status; No differences in use of dental care
Shoffstall-cone & Williard, 2013	Dental therapists	Narrative	-	-	Dental therapists can improve access to oral health care and address health disparities
Simmer-Beck et al., 2017	Public health dental hygienists	Narrative	-	-	Expanding dental hygienists' scope of practice can increase access to care
Singhal et al., 2017	Medicaid, access to care	Trend study	Low income adults	Access to dental care	Improved access associated with an expansion of Medicaid benefits
Singhal et al., 2015	Medicaid, access to care	Interrupted time-series	Adult Medicaid enrollees	Dental-related ED visits	Medicaid's dental coverage elimination increased dental-related ED use
Townsend & Chi, 2017	Loan support	Case studies	Junior pediatric dentistry faculty	Loan repayment	Loan repayment programs make an academic career in pediatric dentistry financially viable
Warder & Edelstein, 2017	Medicaid, dentist participation	Cross-sectional	Dentists participating in Medicaid	Medicaid participation rates for dentists	ADA's 2015 analysis was the most rigorous source

practice in dental professional shortage areas [25-27]. Studies have shown that while these programs may provide only modest per child cost savings to the Medicaid program, they provide an incentive to newly licensed providers to locate their practice in areas with higher needs or to serve primarily uninsured or publicly insured populations [25-27]. In addition, dental school graduates who have an interest in pursuing a career in academic pediatric dentistry may be able to take advantage of numerous state and federal loan repayment programs designed to reduce the student debt burden for junior faculty. These programs provide a pathway for young dentists to care for underserved populations, engage in challenging clinical research and scholarship, and to teach and mentor the next generation of clinicians and researchers [27].

Dental residency and externship programs and primary care physician-based oral health services

Various interdisciplinary patient-centered health care models integrate preventive dental care in medical practices and other non-traditional dental practice settings to improve access and address disparities in oral health in adult and pediatric patients [28-33]. Pediatric primary care physicians are well situated to educate parents about basic oral health practices, provide screening for early childhood caries, and deliver preventive oral health services (e.g. fluoride varnish) during a child's first two years of life [28]. In addition, patients who seek treatment for non-traumatic dental conditions in hospital emergency departments typically are not treated for the underlying condition, usually receiving only antibiotics and prescription pain relief [34]. Research suggests that the high costs associated with providing dental care in emergency departments nationwide can be mitigated by integrating oral health professionals on staff in hospital emergency departments [34]. Studies have shown that primary care physicians and nurses who have received oral health training tend to provide better emergency care to their patients and have a better appreciation for the ways in which oral health can affect overall health [29,31].

Expansion of public education programs to improve oral health literacy

Health literacy is the degree to which a patient understands basic health information and the importance of oral health disease prevention and treatment [35]. Education and income are indicators of self-reported good oral health status among adults [36]. Higher health literacy skills lead to improved patient-dentist communication, better self-care habits, such as regular brushing and flossing, as well as a greater likelihood of being a regular dental care seeker [37]. Community-based health education and literacy programs [5,38,39] have been shown to have a positive effect on overall oral health status and outcomes. In addition, inter-professional education such as training nurses in oral health – has been found to support efforts in improving oral health literacy [31]. While these and other models of oral health education programs have been shown to have an impact on oral health outcomes [12,36,40,41], the relationship between health literacy and oral health is complex [40]. Further studies have been called for to fully understand the extent to which health literacy

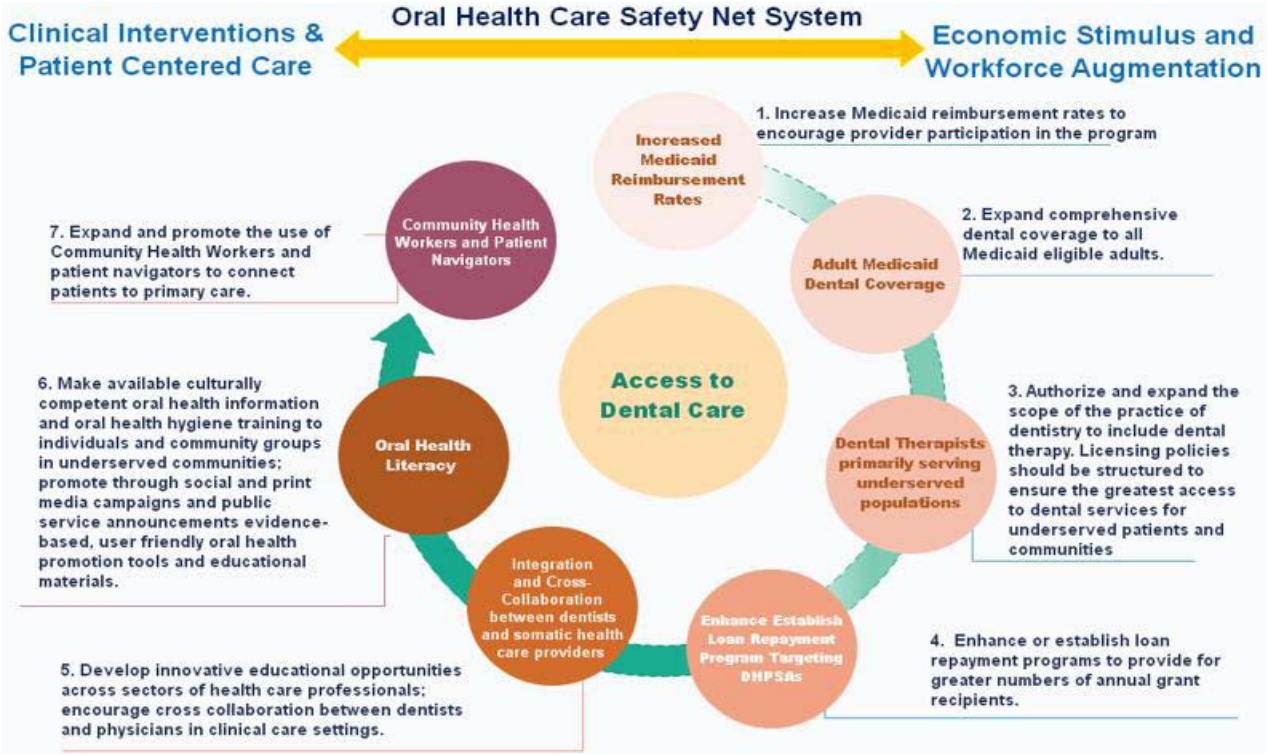

Figure 1: Conceptual Framework to Improve Access to Dental Care.

skills impact access and utilization of health care services, provider-patient communications, and self-care [40].

Expanding the use and scope of practice of dental therapists

Similar to physician assistants in medicine, mid-level dental practitioners known as dental therapists provide preventive and routine restorative oral health care services to patients. Dental therapists practice under the general supervision of a licensed dentist and provide a limited scope of primary oral health care services to patients in a range of settings, including Federally Qualified Health Centers (FQHCs) and community clinics, private practices, nursing homes, and school-based health centers [42].

In Alaska, Dental Health Aide Therapists (DHATs), the first mid-level dental providers in the nation, have provided culturally competent care to more than 40,000 people with extremely limited access to care for over a decade [38,39]. Evaluations of the DHAT workforce model concluded that DHATs operate safely within their scope of practice and have improved access to oral health services [38,39]. In Minnesota, preliminary data indicate that dental therapists have shortened waiting times and travel distances for patients, reduced costs, and improved the utilization of dental services [43] and that the majority of patients treated by the dental therapists are either uninsured or on public insurance [42]. As a relatively new profession in the U.S., dental therapy is not well understood as a workforce model. Patients with perceived need, who lack access to care, viewed dental therapy in a favorable light [44]. Further, studies have shown that dental therapy has the potential to "effectively, safely, and efficiently contribute to the U.S. oral health care delivery system, particularly in dental safety net programs and nonprofit community based practices whose primary mission is caring for the underserved" [9].

Discussion

For advocates and policymakers tasked with prioritizing improvements in an oral health policy agenda, this integrative literature review yields important information. Fundamentally, our research suggests that a holistic and multifaceted approach to strengthening the oral health care safety net is necessary if the oral health status of vulnerable children and adults is to be improved. Ensuring access to basic preventive care and comprehensive dental care for all children and adults should be the guiding principle behind all policy reforms. Policy levers should work, not in isolation, but rather in complementary fashion to one another. Public health interventions that address socioeconomic factors and the contextual influences that make individual decision-making easier tend to have the greatest population impact, while interventions that are more clinical in nature or are designed to achieve individual behavior changes may realize a significant impact to public health, but require greater resources to accomplish the desired result [45].

The conceptual framework presented in the Figure 1 describes programmatic and policy interventions that have the potential to change the ecological context of the oral health safety net. Policies with the broadest capacity to reduce the burden of disease and to affect oral health outcomes are represented at the top of the circle and proceed clockwise in increasing order of intensity of focus on individual patients.

Increases in payments to Medicaid providers and other

administrative reforms are powerful, population-based levers that have been shown to expand network capacity and promote increased access to services for low income families. The expansion of Medicaid dental benefits for adults is a critical step toward promoting good oral health and reducing emergency department use for preventable dental conditions. New and innovative workforce models that include the use of mid-level providers known as dental therapists should also be considered. In addition, states should consider establishing or enhancing existing student loan support for newly licensed dentists in the early stages of their career, with deference given to applicants who agree to serve in geographic regions designated as Dental HPSAs. Innovative educational and clinical care programs that support and encourage continued and greater collaboration across sectors of dental, medical, and nursing of professional practice provide a spectrum of health care services and have the potential to increase access for those unable to obtain care from traditional dental practice settings. Oral health literacy campaigns are important public health interventions that raise awareness of the importance of good oral hygiene behaviors in preventing tooth and gum disease and promote access to and use of oral health care services. Finally, intensive interventions like community health worker and patient navigator programs advance health equity by targeting specific patient populations with information that allows people to make healthier choices and by assisting individual patients to access oral health care resources appropriately.

Conclusion

Addressing the deficiencies in the oral healthcare system will require coordinated policy interventions over a diverse range of community- and patient-level targets. While interventions targeting proximal elements provide swifter short-term results and benefit those who already face the burden of health inequities, more upstream interventions that focus on alleviating the distal determinants will reap more enduring improvements in the long-run and protect vulnerable populations before the repercussions of lack of access cause irreversible harm to their oral health.

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Authors Contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by [Hossein Zare], [Oshin Kanwar] and [Anna L. Davis]. The first draft of the manuscript was written by [Anna L. Davis] and all authors commented on previous versions of the manuscript [Anna L. Davis, Hossein Zare, Oshin Kanwar, Rachael McCleary and Darrell J. Gaskin]. The study has been supervised by Darrell J. Gaskin. All authors read and approved the final manuscript.

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