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Review

Plastic Surgery at a Student-Run Free Clinic: A Review of the Literature and a Call for Access

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Abstract

Background: Across the nation, academic medical centers and associated professional schools have established student-run free clinics (SRFCs) aimed at delivering healthcare to underserved populations. Many of these clinics have expanded their services beyond primary care by offering specialty clinics. However, there is limited information available regarding plastic and reconstructive surgery (PRS) related services within SRFCs. The aim of this study is to identify the presence of PRS services in current SRFCs and highlight barriers and opportunities for plastic surgeons to be involved within SRFCs.
Methods: Aligned with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, a literature review was conducted via PubMed, Embase, and Web of Science from January 2000 to April 2024. Search terms focused on clinical services that are within the scope of practice of a plastic surgeon.
Results: A total of 18 studies where included. Literature addressing PRS in SRFCs is scarce, with only two studies directly examining PRS services in this setting. *Shade Tree Clinic* in Nashville, Tennessee, is the only SRFC that has shared its experience with incorporating PRS services. This included the management of various hand pathologies, soft tissue masses, and skin cancers. While multiple SRFCs offer dermatological services—primarily focused on identifying and excising skin cancers—plastic surgeons are well-equipped to contribute to these efforts. Additionally, most chairs of plastic surgery departments demonstrated a strong understanding of the local need for these services, though time constraints and financial limitations were cited as significant barriers to their involvement.
Conclusion: Currently, there is little evidence of plastic surgeons assisting with SRFC activities. However, incorporating PRS services into SRFCs can significantly enhance healthcare delivery to underserved populations. The *Shade Tree Clinic* has shown the utility and high-level utilization of plastic surgeons in a SRFC.

Introduction

Student-run free clinics (SRFCs) are present in more than 75% of medical schools across the United States (US), with over 70% of graduating seniors reporting volunteer experience at these clinics.[1] These programs create opportunities for students to collaborate, build relationships with individuals in underserved or marginalized communities, and deliver affordable healthcare to those who are uninsured or underinsured. These clinics provide health professions students, particularly those in their preclinical years, with valuable opportunities to work under the supervision of attending physicians. By serving in challenging clinical environments, students gain critical insight and perspective.[2] Additionally, SRFCs play a pivotal role in fostering a commitment to lifelong service among students.[3] Exposure to underserved populations may also increase the likelihood of students

pursuing future service-based work. As SRFCs continue to grow, so do the range of subspecialties and services they offer. Many SRFCs now provide specialty clinics in areas such as psychiatry, dermatology, and obstetrics.[4–9]

Plastic and reconstructive surgery (PRS) is a field that is often overlooked by SRFCs yet can be integral to the services offered by these clinics. Since SRFCs are sometimes the only source of healthcare for socially vulnerable patients, these individuals may have limited access to specialized services like PRS.[10,11] There can be major benefits to plastic surgeons volunteering in SRFCs. Plastic surgeons can address a variety of conditions including hand injuries, soft tissue tumors, burns, and skin cancers, which are prevalent in both the general population and socially vulnerable groups.[12] For instance, non-melanoma skin cancer is the most common cancer worldwide, with an estimated 5.4 million cases treated annually in the US alone.[13] Non-melanoma skin cancers disproportionately affects individuals who often lack access to regular dermatological care, such as houseless populations or migrant workers exposed to prolonged sun exposure without protection.[13] Hand injuries, another common issue managed by plastic surgeons, account for the majority of all workplace injuries and are more frequent in occupations with limited safety protections, often held by immigrants or low-income individuals.[14–16] Burn injuries, affecting over 486,000 people annually in the United States are more prevalent among low-income populations due to substandard housing and unsafe heating practices.[17,18] Plastic surgeons are also able to address diabetic foot ulcers (DFU) which are a serious complication of diabetes, with a lifetime incidence estimated between 19% and 34% among individuals with diabetes.[19] These ulcers are particularly prevalent in underserved populations, where limited access to healthcare and resources exacerbates untreated or poorly managed diabetes.[20] Studies have shown that DFUs are more common among racial and ethnic minority groups and individuals of lower socioeconomic status, contributing to disproportionately high rates of lower-extremity amputations in these communities.[19] Additionally, scarring from traumatic injuries, burns, or surgical procedures is another area where plastic surgeons can provide meaningful care. Vulnerable populations and certain ethnic groups are more likely to develop hypertrophic scars and keloids.[21,22] These scars can impair function, cause discomfort, and result in psychological distress. Scar revision surgery not only improves functionality but also enhances patients' quality of life.

Outside benefits to the patient, it is well recognized that graduate healthcare students can benefit greatly from exploring these specialties through an SRFC model. This is not only because such specialty opportunities may be scarce within the typical US medical school curriculum, but also because it allows students to offer specialized care to patients who might otherwise be unable to afford it.[23–25]

Through a literature review, we aim to highlight any published literature on SRFCs that utilized plastic surgeons or offer services that fall under the scope of practice of a plastic surgeon. We will emphasize the need for PRS services and how plastic surgeons can help in addressing specialized services that are already offered at many SRFCs. Lastly, this study will highlight the limitations in incorporating PRS services in the SRFC model and highlight methods to overcome these barriers in engaging plastic surgeons.

Methods

This study was performed in accordance with the Preferred Reporting Items for Systematic reviews and Meta-analyses (PRISMA) guidelines.[26] A literature search was performed using PubMed (Medline), Embase, and Web of Science from January 2000 to April 2024. The following pre-determined search terms were used: "plastic surgery" OR "reconstructive surgery" OR "cosmetic surgery" OR "hand surgery" OR "burn surgery" OR "surgery" AND "student-run clinic" OR "student clinic" OR "free clinic" OR "charitable clinic." The full search string utilized for each database is shown in the Appendix.

Articles obtained from searching the specified databases were extracted and placed into Covidence (Veritas Health Innovation, Melbourne, Australia) for initial title and abstract screening. Inclusion criteria for this study included any mention of healthcare services that fall within the scope of practice of a plastic surgeon. This includes but is not limited to skin excisions, skin cancer, hand injuries, burns, wound healing, reconstruction, soft tissue excisions, scar treatment, scar management, craniofacial defects, and hernias. Screening was independently performed by two investigators (CH and BR) by title and abstract and later by full text review. Conflicts were resolved by a third reviewer (RB). Exclusion criteria included the following: articles not published in English, no-full text available, do not discuss care that is within the scope of practice of a plastic surgeon, or do not discuss free, charitable, or student-run clinics.

Results

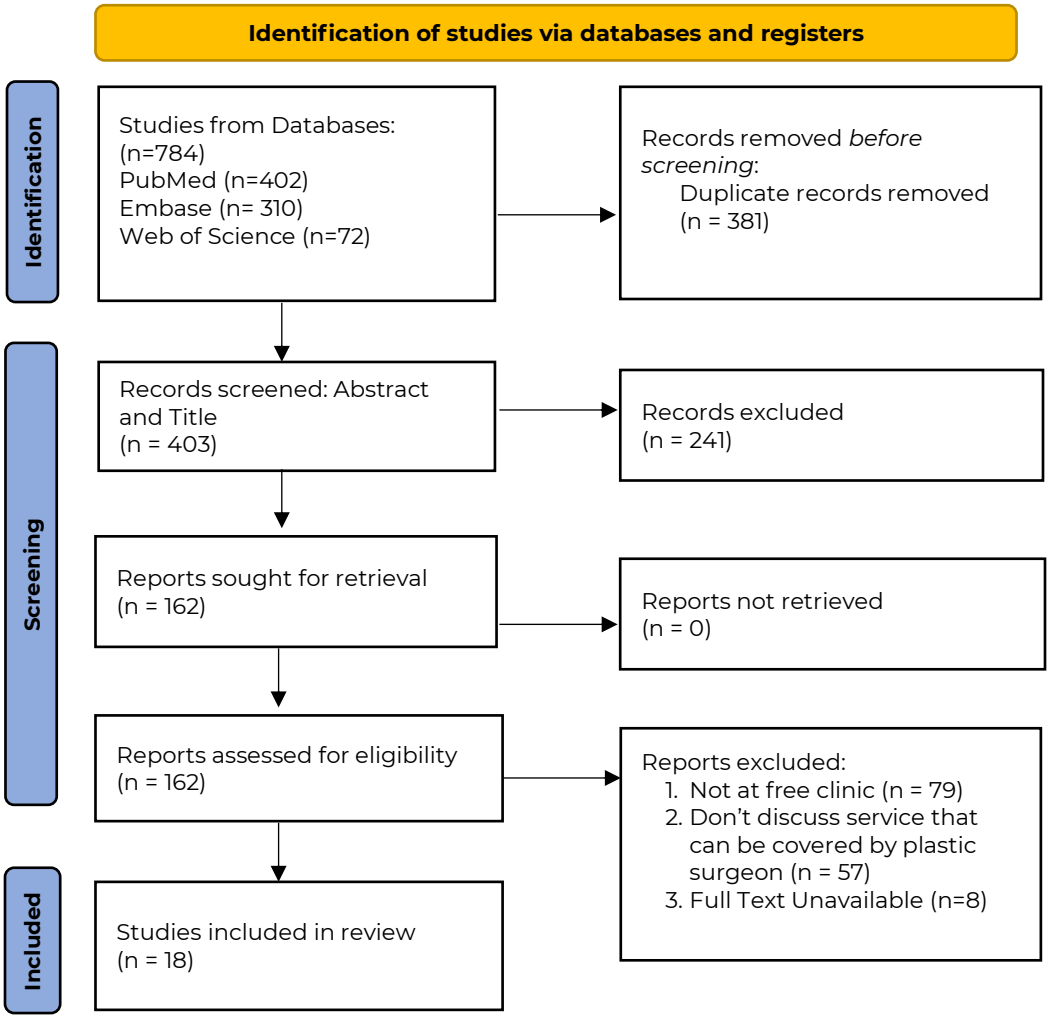
Our initial search yielded 784 articles, and after removing duplicates, 402 articles went through title and abstract screening. Full-text screening consisted of 162 articles with only 18 articles meeting inclusion criteria (Figure 1). Table 1 provides a summary of the articles including year of publication, location of the free clinic, and services that the clinic offers that are within the scope of practice of a plastic surgeon.

Based on the 18 identified articles, 13 different SRFCs already provide services that fall within the scope of practice of a plastic surgeon.[8,9,27–37] One SRFC in particular (*Shade Tree Clinic*) already provides plastic surgery consultations, with multiple clinical presentations being immediately addressed and covered by plastic surgeons or students interested in pursuing a career in plastic surgery.[2,38] *Shade Tree Clinic* has published two descriptive accounts on utilizing plastic surgeons within their clinic. Based on the search, this is the only SRFC that has specifically published on active plastic surgeon involvement and engagement at a SRFC.

The most common clinical service reported by SRFCs that fall within the scope of practice of plastic surgeons is skin cancer and skin biopsies. After skin cancer, three studies highlight plastic surgeons treating various hand pathologies.[2,38,39] All three studies were published from *Shade Tree Clinic* in Nashville, Tennessee (TN) The studies were descriptive analyses and discussed their clinic's experience treating the following hand pathologies: chronic arthritis, trigger finger, ganglion cyst, and carpal tunnel. In addition to hand pathologies, *Shade Tree Clinic* published another descriptive analysis about removing various soft tissues masses, multiple of which were located on the hand.[40] The multiple studies from *Shade Tree Clinic* demonstrate a clinical need and use of plastic surgeons as a specialized provider within a SRFC model.

A study focusing on the challenges of engaging plastic surgeons in charitable clinic settings highlighted the perspectives of department chairs from various plastic surgery programs. These leaders expressed a strong interest in expanding PRS services within student-run and charitable clinics in their local communities.[41] The majority (55%) of PRS chairs reported an unmet need for plastic surgery in their local communities, with 46% reporting that current faculty within their department were already involved in local service.[41] Additionally, 41% of these chairs stated there was already resident involvement in providing local charitable PRS services.[41] Chairs also reported that 29% of their department had some involvement with a SRFC or other types of local free clinics.[41] The two most frequently cited barriers by department chairs for local volunteer engagement were the time commitment and the cost of specialized supplies and equipment required for diagnosing and treating common plastic surgery conditions.[41] This includes imaging services, like handheld ultrasound, along with supplies, such as hand splits.

Figure 1. PRISMA diagram



Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram displays the screening process for the included articles.

Discussion

The results of this literature review highlight the limited presence of PRS services in SRFCs across the United States. Currently, the one documented SRFC that utilizes plastic surgeons within their clinic is the *Shade Tree Clinic*, located in Nashville, Tennessee. The literature also emphasizes that in SRFCs already offering specialized services, plastic surgeons can address common conditions such as skin cancer and hand injuries while expanding PRS services to enhance the overall care provided to the vulnerable populations these clinics serve. This is crucial in further developing SRFCs services as PRS services cover a range of conditions that disproportionately affect underserved populations. For example, the frequent mention of skin biopsies and skin cancer treatment underscores the high demand for dermatological care in these communities.[42] Hand pathologies, such as carpal tunnel syndrome, also represent a significant need in the uninsured population.[43,44] The national incidence of carpal tunnel syndrome has been reported between 1-5% of the population.[45] The focus on hand pathologies reported from *Shade Tree Clinic* demonstrates both the needed demand and the feasibility of incorporating PRS services into a SRFC model. The successful integration of PRS services at *The Shade Tree Clinic* can serve as a model for other clinics wanting to expand their services.

Furthermore, addressing these conditions early can prevent long-term disability and improve quality of life, emphasizing the critical role of PRS in comprehensive healthcare for underserved populations.[45]

Table 1. Characteristics of studies

Author, Year	Location	Clinic name	Services or surgical conditions covered by a Plastic Surgeon	Article type
Blackmond, 2020	Pontiac, Missisippi	Gary Burnstein Clinic	Wound management	Case report
Das, 2023	Nashville, Tennessee	Shade Tree Clinic	Carpal tunnel syndrome Contractures Wound management Soft tissue masses Lipoma Keloid Skin cancer Skin redundancy	Descriptive analysis
Dhami, 2019	Seattle, Washington	Community Health Advancement Program	Skin biopsy Skin cancer	Descriptive analysis
Evans, 2020	Nashville, Tennessee	Shade Tree Clinic	Soft tissue mass	Descriptive analysis
Kamath, 2018	Miami, Florida	Mitchell Wolfson Sr. Department of Community Service	Skin biopsy Skin cancer	Call-to-action
Kuhn, 2020	Nashville, Tennessee	Shade Tree Clinic	Hand pathologies	Descriptive analysis
Lin, 2021	Lubbock, Texas	Free Clinic at Lubbock	Skin biopsy Skin cancer	Descriptive analysis
Losey-Flores, 2014	Omaha, Nebraska	University of Nebraska - Surgery on Sunday	Hernia	Descriptive analysis
Makhoul, 2020	Nashville, Tennessee	Shade Tree Clinic	Trigger finger Ganglion cyst Keloid	Descriptive analysis
Mirza, 2021	New Haven, Connecticut	Haven	Skin biopsy Skin cancer	Descriptive analysis
Ngo, 2023	Dallas, Texas	Agape Dermatology Student Run Free Clinic	Skin biopsy Skin cancer	Descriptive analysis
O'Connell, 2021	Norfolk, Virginia	The Health Outreach Partnerships of EVMS Students (HOPES)	Skin biopsy Skin cancer	Descriptive analysis
Patel, 2022	Pittsburgh, Pennsylvania	The Student Dermatology Clinic for the Underserved	Skin biopsy Skin cancer	Descriptive analysis
Pyles, 2016	Palo Alto, California	Cardinal Free Clinic	Skin biopsy	Descriptive analysis
Reasoner, 2018	Nashville, Tennessee	Shade Tree Clinic	Hand pathologies	Descriptive analysis
Smith, 2014	United States	Not Applicable	Lipoma	Descriptive analysis
Sow, 2024	Atlanta, Georgia	Health Equity for All Lives Clinic	Skin biopsy	Descriptive analysis
Teal, 2020	Austin, Texas	CD Doyle Clinic	Skin biopsy	Descriptive analysis

Despite the demonstrated benefits of providing these types of PRS services, several barriers hinder the broader implementation of these services at SRFCs. One primary barrier identified in this literature review is the availability of plastic surgeons. In some states like Wyoming, there is only 3 plastic surgeons, meaning there are 0.051 plastic surgeons per 10,000 individuals.[46] This shortage can be compounded by the overall focus of SRFCs being on primary care, which may overshadow the need and desire for SRFCs to establish specialty services like PRS.

Additionally, funding has been reported by plastic surgery department chairs as being a significant challenge. Providing specialized care requires specific equipment and supplies, which may not be readily available in all SRFCs. The financial sustainability of offering such services is a critical consideration, especially in clinics that rely heavily on donations and or limited funding. Logistical issues also play a role in providing PRS services, including the coordination of volunteer schedules and ensuring consistent availability of PRS specialists. SRFCs often operate on limited hours and rely on medical students and volunteers to run clinics. These limited and unpredictable schedules can lead to inconsistencies in specialty services provided, impacting patient care and follow-up.

To overcome these barriers, several strategies can be implemented. Increasing collaboration between medical schools, professional organizations, and healthcare providers can help bridge the gap in specialty care availability.[47–49] For example, establishing partnerships with local hospitals and PRS practices can provide additional resources and expertise to SRFCs. This concept of 'regional collaboration' has been shown to improve patient outcomes in socially disadvantage groups while decreasing overall healthcare costs.[50,51] Initiatives that encourage plastic surgeons to volunteer or provide pro bono services in SRFCs could be promoted, possibly through incentives such as continuing medical education credits or public recognition programs.[52,53] Additionally, telemedicine consultations could be utilized to extend the reach of plastic surgeons into rural and underserved areas, along with surgeons who may not have availability to physically come to the clinic.[51,54,55] Telemedicine can facilitate preoperative consultations or follow-up care, thereby increasing the reach and impact of PRS services. A study from Kaiser Permanente examining surgical telehealth consult rates before and after Coronavirus disease 2019 restrictions found that patients who received telehealth consults during quarantine connected with providers more quickly and were able to undergo necessary surgeries sooner compared to non-telehealth patients.[56] Additionally, other studies have demonstrated that providing surgical telehealth consultations to those in rural communities decreased disparities and increase patient satisfaction with their surgical services.[57] By implementing these multifaceted strategies, SRFCs can effectively overcome barriers and provide comprehensive plastic surgery care to underserved populations.

Conclusion

The incorporation of PRS services into SRFCs has the potential to greatly enhance healthcare access for underserved populations. Although there are challenges, targeted initiatives to expand and integrate PRS within SRFCs will not only bolster existing specialty care but also increase the range of available services. Clinics like *Shade Tree Clinic* offer encouraging examples of how such obstacles can be overcome, paving the way for broader adoption of plastic surgery services in SRFCs across the country. Expanding these services is a crucial step toward reducing healthcare disparities and improving care quality for underserved communities. By harnessing the strengths of medical education, community partnerships, and innovative care models, SRFCs can become pivotal in reshaping healthcare delivery and ensuring equitable access to specialized care for all.

Disclosures

The authors have no conflicts of interest to disclose.

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