

**From Tribes to Treadmills:  
A case study of attitudes surrounding physical activity and gym use among a cohort of  
Bedouin women users in an all-female gym**

by

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The twenty-first century marks an epoch of global urbanization—the transition from a rural, geographic locality to a population dense environment. Once a semi-nomadic people of the Negev Desert, the Bedouin population in Israel is not exempt from such processes of development, evident in the government sedentarization project beginning in 1965. Modernist, urban planning executed during the construction of the Bedouin towns was aimed at replicating Jewish towns, and in turn had an impact on issues of female modesty and intra-tribal tensions. Bedouin women, in particular, experience the effects of such an acute lifestyle transition due to their role as females in a patriarchal society among a minority population. In an attempt to preserve modesty, Bedouin women face an impediment on mobility in the town environment due to the close proximity of unrelated tribes relocated into the same town. Due to the inherent challenge regarding female modesty, restrictions on mobility and independence limit a woman's opportunity to perform leisure time physical activity, despite the presence of proper infrastructure: sidewalks and green spaces. As a result, a temporal correlation exists between the sedentarization project and increased levels of obesity-related chronic disease in the town, with women experiencing higher rates of these diseases than men. The relationship between the built environment and physical activity is a new research focus at the crossroads of urban planning and public health. Literature addressing the relationship between the built environment and

physical activity in Muslim populations is limited, and almost nonexistent for Bedouin society. A survey distributed in an all-women's gym, Al Najach Gym Hall, in Rahat, Israel served to capture the demographics and attitudes surrounding physical activity and gym use in a female Bedouin cohort (28 subjects) of gym users, and to assess their perceived barriers to healthy lifestyle behavior. The results of this modest qualitative survey will establish a foundation for future research aimed at improving infrastructure and policy toward healthy lifestyle practices related to physical activity.

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## PREFACE

I would like to extend my sincerest thanks to a number of people, without whom, my Bachelor of Philosophy thesis would not have come to fruition. My interest in the Bedouin and the foundation of my research began in affiliation with Ben Gurion University of the Negev, Israel. I am grateful for the support and guidance of Nora Gottlieb and Dr. Nadav Davidovitch who helped to make my exploration of urbanized Bedouin health issues come to life through literature, lectures, candid conversations and fieldwork. Dr. Younis Abu-Rabia, thank you for picking me up every Sunday, Tuesday and Thursday and toting me to work with you. Your willingness to welcome me into your health clinics and the opportunity to interact with your patients was an invaluable experience that added great depth to my understanding of the complexities of Bedouin health.

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Finally, to my parents and brother, I *could* begin to write the reasons for which to thank you, but that would quickly become another thesis. I am forever thankful for your love and support.

## 1.0 INTRODUCTION

As a result of global processes, distinct prevalence patterns underscore the relationship between socioeconomic status, residential distribution and physical activity.[1-3] The State of Israel serves as an interesting case study to investigate how these determinants characterize the current health status of the Israeli-Arab minority population—specifically the Bedouin. A formerly semi-nomadic culture, a majority of the Bedouin population currently resides in a peripheral, government-planned urbanized environment. Although this transformation to a more modernized society has allowed for some improvements in the lives of the Bedouin, the marked change in lifestyle does not come without consequence. Today, Bedouin are exposed to many elements of urbanity that encourage behavior detrimental to one’s health, such as the consumption of processed food and reliance on cars rather than walking.

Currently, approximately half of the Bedouin population no longer practices migratory living or agricultural cultivation. Instead these Bedouin reside in a number of planned towns situated throughout the Negev.[4, 5] Lifestyle considerations once inherent to Bedouin nomadism—spatial delineation between tribes and gender modesty—are poorly preserved through the skeletal infrastructure of the urban locales. The negative residual effects of these changes prove compounding, from the overarching tribal level to the status of the female Bedouin counterpart—evident since the sedentarization project was initiated in the late 1960s.[6] In turn, women experience unprecedented rates of obesity-related chronic disease.[1, 7]

It can be argued that Bedouin women endure unparalleled marginalization in response to the heightened cultural preservation among the patriarchal, urbanized society.[6, 8-10] Western conceptions of space and orientation define the planned towns built for the Bedouin in the Negev. For many reasons, the Bedouin did not fully embrace the transition from a semi-nomadic lifestyle to an urban locale. The drastic change in residential environment largely redefined gender roles in Bedouin society.[10, 11] As former migrating tribal units, less emphasis was placed on gender constructs. The arid expanses of the desert provided enough privacy to enable female mobility and promote empowerment without jeopardizing modesty. However, resettlement into densely populated towns (relative to their previous environment) diminished female equality and mobility in the wake of modernity.

In order to preserve Bedouin women's modesty, delineations between public and private space were established in the towns based on familial and tribal affiliation. The cultural characteristics that define Bedouin society proved more restricting for women. Unlike non-Bedouin Arab women who utilize the hijab as a mechanism to facilitate navigation in the public sphere, the same does not hold true in Bedouin codes.[6] A Bedouin woman's overexposure in the built environment—defiance of public space—can potentially bring shame and dishonor upon her family. Therefore, women cannot utilize public infrastructure such as sidewalks and parks with the same autonomy as their male counterpart. These cultural limitations endured by urbanized Bedouin women serve as a barrier to pursuing physical activity as a means of exercise in the town setting.[1, 6]

In Rahat, a government-planned Bedouin city, gyms are becoming an accepted amenity aimed at providing female residents with an exercise environment that reflects western conceptions of healthy lifestyle practices. The barriers women face when pursuing a healthy

lifestyle are the result of a complex layering of global, political and cultural influences. When investigating the dynamic interactions of these factors, Rahat serves as a microcosmic environment that captures an array of processes at work: colonization, urbanization, epidemiologic transition and female empowerment. Implementing a gym within the culturally dynamic city demonstrates the acceptance of a modern health solution in response to an acute, yet pervasive lifestyle change.

Al Najach Gym Hall is an innovative amenity in Rahat designed to provide women with a culturally acceptable exercise environment. The gym is an infrastructural response to Bedouin urbanization—an amenity that would otherwise be irrelevant to a migrating society. Establishing a women’s gym provides female residents with an outlet than enables them to pursue an active lifestyle in a culturally acceptable way. This study aims to ascertain information regarding the physical activity regimens of women who utilize the facility, as well as the barriers they face toward incorporating the gym into their daily lives. By exploring the impact of Al Najach on the female patrons, the success of the gym can be assessed for potential future replication in neighboring Bedouin towns in the Negev.

## **2.0 BACKGROUND**

### **2.1 A BRIEF PERSPECTIVE ON URBAN HEALTH**

The twenty-first century marks an epoch of global urbanization—the transition from a rural, geographic locality to a population dense environment. Worldwide, over half of the population lives in an urban environment, and according to projected demographic data, by the year 2050 the percentage of urbanized inhabitants will surpass 70%.[12] The pace at which a population executes the rural-urban transition varies by region, government involvement and culture. Nonetheless, the built environment has the ability to localize resources and present opportunities. A confluence of infrastructure; sanitation; social and health services; education; transportation and employment catalyzes human departure from the rural to the urban. Subsequent interactions sustained by urban inhabitants and their shared environment proves impactful on population health. Considering how these facets of development influence quality of life, the urban environment is undoubtedly a determinate of health that cannot be overlooked or underestimated.

Health statistics depicting the rural-urban transition illustrate distinct trends that allude to the benefits of urbanization. Throughout space and time, urbanization consistently decreases mortality rates, fertility rates and acute childhood infections, while concomitantly increasing birth weight and life expectancy.[12, 13] Improved health indicators highlight the distinguishing demographic features that differentiate developed countries from developing countries, and appear to capture how the amenities provided in an urban environment can positively influence quality of life. However, the presence of health resources does not always equate to better health. Dramatic changes in disease presentation and diet composition are a response to the processes of globalization. It can be argued that urbanized populations do not maintain a superior level of health, simply “*different* health and health problems.”[14] The built environment intensifies the relationship among these aspects of development in a way that shifts disease burden from infectious and communicable to chronic and manmade—diseases that manifest in an obesogenic environment.

Sedentarization, inherently promoted in an urban setting, compounds the effects of excessive calorie intake. As a result of this growing energy imbalance among the urban demographic, obesity and obesity-related chronic disease threaten the health of urban populations at epidemic levels. The World Health Organization defines obesity as a disproportionate amount of energy intake in relation to one’s energy expenditure. To maintain a healthy weight, an individual’s daily physical activity (energy expenditure) must burn an equivalent number of kilocalories consumed (energy intake). If this equation is not executed sufficiently and routinely, weight gain is probable to ensue over time. Excessive weight gain is clinically diagnosed when body mass index (BMI)—measured as a person’s weight (kg) divided



by the square of his or her height ( $m^2$ )—equals or exceeds 25, and obesity onset occurs when this measurement equals or exceeds 30.

Yet, the health implications of obesity pose a greater threat than a numerical calculation; obesity is a proven determinant of disability, morbidity and premature death. Comorbidities associated with obesity include, but are not limited to: cardiovascular diseases, type two diabetes, musculoskeletal disorders and some forms of cancer.[15] As a result, severely obese individuals risk dying ten years premature. Since the 1980s, this risk has become a grave possibility for a dramatically increasing number of individuals in the Organisation for Economic Co-Operation and Development (OECD) countries; a recent report suggests that the rates of obesity among OECD countries have at least doubled in the past thirty years.[16] Two marked lifestyle behaviors are largely responsible for excessive weight gain worldwide: 1.) increased consumption of energy-dense, over processed foods that contain high levels of sodium, fat and sugar and low levels of essential vitamins and 2.) alternatives to transportation, employment and recreation that promote physical inactivity.[3, 15, 17]

The health benefits of physical activity are widely known and extensively published. Studies indicate that physical activity serves a vital role in reducing obesity and a widening array of other non-communicable diseases that include: cardiovascular disease, diabetes mellitus and various cancers.[18] Despite the acknowledgement of physical activity as a viable, nonpharmacological approach to stemming obesity and related chronic illness, predominately sedentary lifestyles impede public health translational efforts. A decline in physical activity levels alludes to changes in lifestyle, as the inherency of leisure time physical activity has decreased in one's daily routine. Technological advances enable individuals to execute once strenuous tasks with minimal effort, and in turn dictate a marked decrease in daily energy

expenditure. Physical inactivity is demonstrated through sedentary work environments, automobile dependency and convenience-driven lifestyles. Overall, these behaviors suggest the adoption of a western lifestyle—a change in living that catalyzes morbidity and mortality, and detracts from quality of life.

## **2.2 BEDOUIN URBANIZATION**

The founding of the State of Israel served as a catalyst for the Bedouin sedentarization project—an initiative that propelled Bedouin through a lifestyle transition centered on development and westernization. Scholars generally consider the period from 1948 to 1963 as the spontaneous sedentarization phase (though the extent to which the indigenous people began to adopt sedentary tendencies in response to “agents of change” occurred well before the establishment of the state).[4, 19] Despite the tribes’ deeply rooted nomadic lifestyle, the state introduced a military presence in the Negev that usurped expansive plots of pastoral land, demolished hundreds of tribal villages and expelled approximately 80% to 85% of the indigenous population—representative of 80 Bedouin tribes—to regions beyond Israeli borders (Jordan and Egypt).[4] Residential housing initiatives began in 1965 after a 20-year period of military surveillance. Permanent housing developments represent a shift away from spontaneous sedentarization to planned sedentarization—the second phase of the Bedouin transition.[4]

The Housing Ministry employed a homogenously Jewish team of architects and planners to create and execute the master plan for the original municipal towns. As a result, the original layout of the Bedouin locale proved to be an extension of the planning concepts utilized in the

development of neighboring Jewish communities. According to Fenster, housing authorities assumed that Bedouin input would not be needed. Rather the sedentarized population was expected to adapt their lifestyle in response to the newly constructed environment.[6]

Throughout the transition from a semi-nomadic people to a sedentary society, territoriality heightened as families and different tribes shared smaller environments with higher densities. Confining land plots (less than 500 m<sup>2</sup>) and insufficiently sized houses (50 m<sup>2</sup>) exacerbated territoriality and restricted female mobility.[20]

The State of Israel pursued urbanizing the Bedouin to make available essential government resources, and in turn to improve the society's quality of life. Through the urbanization initiative, Israel introduced electricity, water, municipal services, public schools and health clinics within the towns. As stated earlier, the introduction of such resources have an unprecedented effect on improving a population's quality of life, which holds true for the Bedouin demographic transition. Since the 1950s, both mortality rates and fertility rates have declined among the population in response to the resources made available.[21] Initial health services provided in Bedouin towns aimed to implement inoculation campaigns for tuberculosis in addition to mother and child services as early as the 1950s.[22] As the Bedouin continue to transition and adapt to an urban environment, the disease prevalence shifts dramatically toward the burden of chronic disease. However, the health resources provided in Bedouin communities continue to address acute over noninfectious illness. Comprehending the importance of preventive medicine and learning how to manage chronic disease in the Bedouin population has yet to be mastered [5]. Implementing effective preventive medical resources and interventions should be deemed a priority in Bedouin society when considering the pronounced correlation between urbanization and chronic disease.

### **2.3 SUBSEQUENT HEALTH IMPLICATIONS FOR THE BEDOUIN**

Dramatic discrepancies among major health indicators help to quantify the burden of disease incurred by the general Bedouin population from an era of semi-nomadism to present day. The timeline depicting Bedouin resettlement and chronic disease onset presents an intriguing correlation.[5] As early as the 1950s, military surveillance of the population relegated the Bedouin to a “reserved” territory of southern Israel that initially served to contain the semi-nomadic people and, in turn, impeded traditional migratory practices. Bedouin health data collected in the early 1960s reports minimal levels of hypertension and diabetes, and no ischemic heart disease.[23] On September 19, 1965 attainment of government approval allowed for the planning and construction of urban Bedouin townships to begin, and by the 1970s, noticeable rates of chronic disease surfaced in Bedouin health data.[5] In 1990, a publication by Fraser et al. presented data suggesting a pronounced burden of overweight and obesity among an urbanized Bedouin cohort of men compared to a similar male cohort that maintained a traditional lifestyle. These markedly increased levels of overweight and obesity could also be due, in part, to improved health surveillance efforts for the population.[24] Statistics generated by the Israel Center for Disease Control underscore the developing gender disparity. In 2007, prevalence rates for hypertension, diabetes and cardiac diseases were more pronounced for Israeli Arab women over the age of 59, than the male counterpart.[7] To better understand the gender discrepancies in chronic disease burden, one must consider the dynamic lifestyle changes Bedouin women endure as they transition from a semi-nomadic environment to the urban locale.

## 2.4 URBANIZED FEMALE BEDOUIN

In response to the dependent relationship the Bedouin now maintain with the state, (catalyzed by urbanization and subsequent economic despair) the preservation of traditions remains one of the few ways for the indigenous people to preserve cultural identity. Male dominance is a defining social construct that distinguishes the Bedouin population from similar epochs of top-down social influence and urbanization strategies. As the layers of marginalization accumulate from the state-level downward, Bedouin men strive to preserve patriarchal dominance—pervasive in the home, economy and politics—that defines their society.[8] In response, women are kept cloistered within culturally defined private space. These codified gender dynamics serve as the foundation of Bedouin society, and create a complex framework of triple marginalization. Abu-Rabia organizes the female social structure as “1.) women in a 2.) patriarchal-tribal society as part of 3.) an ethnic minority in a Jewish state.”[25] The modern, urban environment heightens the severity of these issues and therefore warrants further analysis.

The position women maintain in urban Bedouin society depicts a digression from the traditional, nomadic lifestyle of their past. Women have lost a substantial amount of their economic role—and power—in the once agrarian society.[6, 10, 25, 26] Traditionally, women assumed integral responsibilities both within and outside the home: building the family tent, collecting resources such as water and wood, tending to the farm, herding livestock and preparing meals.[8, 10] Marked changes in lifestyle leave the majority of traditional jobs obsolete in the built environment. Many tasks and responsibilities once executed by women are now inherent fixtures within the towns. Water and electricity allocation are municipal services. Concrete and stone homes have replaced tents. Wage labor has replaced tribal farming and

herding. Yet, over time and space, Bedouin women maintain one role that cannot be replaced or replicated by their male counterpart—child bearer.

In modern Bedouin society, a woman's social status is determined by her ability to be a suitable wife and mother, especially a mother to many sons. Her domestic role no longer emphasizes an economic contribution. Men seek job opportunities that require daily commutes to neighboring Jewish towns or farms as a means to support a growing family. This integration with broader Israeli society foments a marginalizing gap between the male and female heads of household, and signifies independence from the wife who traditionally served as the decision maker. While education and employment rates among female Bedouin continue to rise in recent years, 90% of women remain unemployed.[25] The distinct dichotomy in gender roles further speaks to the woman's immobility, as her responsibilities emphasize relegation to the home.

Embedded cultural restrictions prevent westernized forms of exercise to be executed by women in the public sphere, which proves detrimental to female Bedouin health. For westernized societies, infrastructure such as sidewalks and parks in the public sphere serve as viable environments for achieving fitness through walking, jogging and recreational activity. Bedouin towns have the same public amenities, yet sidewalks and fields are not utilized for leisure physical activity. For urbanized Bedouin women, the built environment can be a threatening arena. The lack of cultural awareness maintained by the Jewish Israeli architects who planned Rahat, created a master plan that concentrated incompatible Bedouin tribes into one communal space. A woman seen walking alone agitates the social tension of the urban environment. Attempts to utilize the township sidewalks and green space often result in familial disapproval, harassment from passersby in cars and local gossip.[1, 6] These negative experiences quickly thwart any attempts for women to execute physical activity beyond the confines of their home.

Considering the barriers Bedouin women encounter in pursuing physical activity, it is important to explore how females can overcome subordination and environmental constraints in order to pursue active lifestyles.

## 2.5 THE CITY OF RAHAT, ISRAEL

Located approximately twenty kilometers northwest of Beer Sheva, Rahat, the city in which this study occurred, serves as a redeeming response to the less than successful design and implementation of the first Bedouin town, Tel Sheva. Meir describes the renewed planning perspective of Rahat, built in 1972, as one that captured the “hierarchical matching between spatial divisions and social divisions” in an attempt to meet the needs of Bedouin cultural norms.[4] Distinct neighborhoods within the town organize homes by nuclear family (houses) and extended family (cul-de-sacs), which together represent a *hamula* or tribe.[10] Cultural sensitivity in Rahat’s residential planning provided more adequate space for large families and livestock by incorporating elements of both modern and traditional Bedouin housing. In comparison to spontaneous living arrangements, however, the close proximity between nuclear families and extended families remains contested. With two to three houses per dunam (approximately one-quarter acre) in-laws often share residential space with their children, which has the potential to create tenuous living arrangements.[6]

The street layout planned for Rahat, perhaps unconventional by western standards, is designed to address issues of tribal divisions and familial codes. Cul-de-sac street design preserves privacy for the nuclear and extended Bedouin families. The circular, all-

encompassing shape helps to minimize the possibility of undesirable encounters with rivaling residents who are largely confined to adjacent hamula cul-de-sacs. Meir explains that “the processes [of territoriality] indicate that settling in Rahat in particular—and semiurbanization in general—have further intensified territorial behavior within Bedouin society.”[26] Nevertheless, the radial neighborhood design proved transitive in primary road development. The successful remodeling of the Bedouin town—executed through the construction of Rahat—has had a lasting effect on the planning of subsequent towns.

Early Rahat maintained an original jurisdiction area of 8,800 dunam (approximately 2,200 acres) that contained twenty-six neighborhoods divided among 35,000 residents.[26] By 1994, the town of Rahat reached city status. Today, Rahat has expanded to a jurisdiction of 19,585 dunam (approximately 5,000 acres).[26] The current population is approximately 50,000 inhabitants, with projections of 100,000 by 2020. The city has one bank, one post office, a cultural center and two gyms, unlike the smaller Bedouin towns.[27] Additionally Rahat is the only town connected to Beer Sheva via formal, public transportation. Increasing resource accessibility—made possible by the localization of municipal services and town amenities—demonstrates one of the beneficial consequences of urbanization. However, the acute introduction of such conveniences in a residential setting that restricts Bedouin of their semi-nomadic behavior nonetheless fosters an obesogenic environment with deleterious health implications.



### 3.0 STUDY PURPOSE

The patriarchal tribal structure characteristic of Bedouin society often dictates the role women assume in society. This uneven gender dynamic creates an environment that largely eliminates access to infrastructure in the urban environment, which would otherwise facilitate an active lifestyle. However, as opportunities are made available, women find new ways to develop an autonomous identity. Abu-Rabia-Queder has captured this phenomenon through her work investigating the increasing number of girls and women seeking education.[11, 28] A female presence in the classroom suggests that academic achievement can serve as a facilitating force in overcoming the cultural and social constraints heightened by the modern, urban environment. Like a school, a gym serves a similar role. An exercise facility centered on the female client presents a setting where women can take control of their person in a way that overcomes the spatially deterministic environment of the government-planned town. A setting such as this could help to combat the epidemic levels of obesity and chronic disease that currently burdens women at disproportionate rates.[7]

In Rahat, gyms are becoming an accepted amenity aimed at providing residents of the city with an exercise environment that reflects western conceptions of healthy lifestyle practices. Al Najach Gym Hall in Rahat is an innovative facility designed to cater specifically to the fitness needs of Bedouin women—the only one of its kind. Al Najach provides women with an alternative environment for exercising beyond the confining private space of their homes. The

gym features the employment of an all-female training staff and curtains draped over the windows for privacy. These cultural considerations, factored into the gym through a post-modern approach to facility planning, provide women with an atmosphere conducive for physical activity that does not threaten a woman's modesty.

The purpose of this study is two-fold: 1.) to capture the demographics and perceptions surrounding physical activity and gym use of a female Bedouin cohort of members of the newly realized Al Najach Gym and 2.) to assess perceived barriers to healthy lifestyle behavior among these female gym users.

To the investigator's knowledge, only one qualitative study has attempted to address Arab Israeli perceptions of physical activity; however, the study was not among a homogenously Bedouin cohort.[1] As obesity-related chronic disease continues to increase among female Bedouin, the results of this modest qualitative survey will establish a foundation for future research aimed at improving infrastructure and policy toward healthy lifestyle practices related to physical activity.

## **4.0 METHODOLOGY**

### **4.1 STUDY DESIGN**

This study was a simple descriptive qualitative evaluation conducted among Bedouin women over the age of 18 years to ascertain their individual attitudes toward gym facility usage and healthy lifestyle behaviors. The PI executed this study during a three-week period from December 2012 to January 2013 in the city of Rahat, Israel.

#### **4.1.1 Setting**

The Al Najach Gym Hall was chosen as the location for this project because it is the only gym of its kind in the area designed to accommodate specifically the needs of a female Bedouin clientele. Located in neighborhood 34 of Rahat, the hall serves as a multipurpose community center that houses a basketball court, recreation rooms/classrooms and gym accommodations. (See Figures 1 & 2 for geographic and spatial orientation) Plans to develop the gym began seven years ago. The current gym manager, who assumed the managerial position in 2008-2009, expressed to the mayor of Rahat the need for a gym designed for women. The gym manager recognized that although two other exercise facilities existed in the city, they did not accommodate the cultural needs of Bedouin women. He believed that women would benefit from an indoor environment that promoted physical activity.

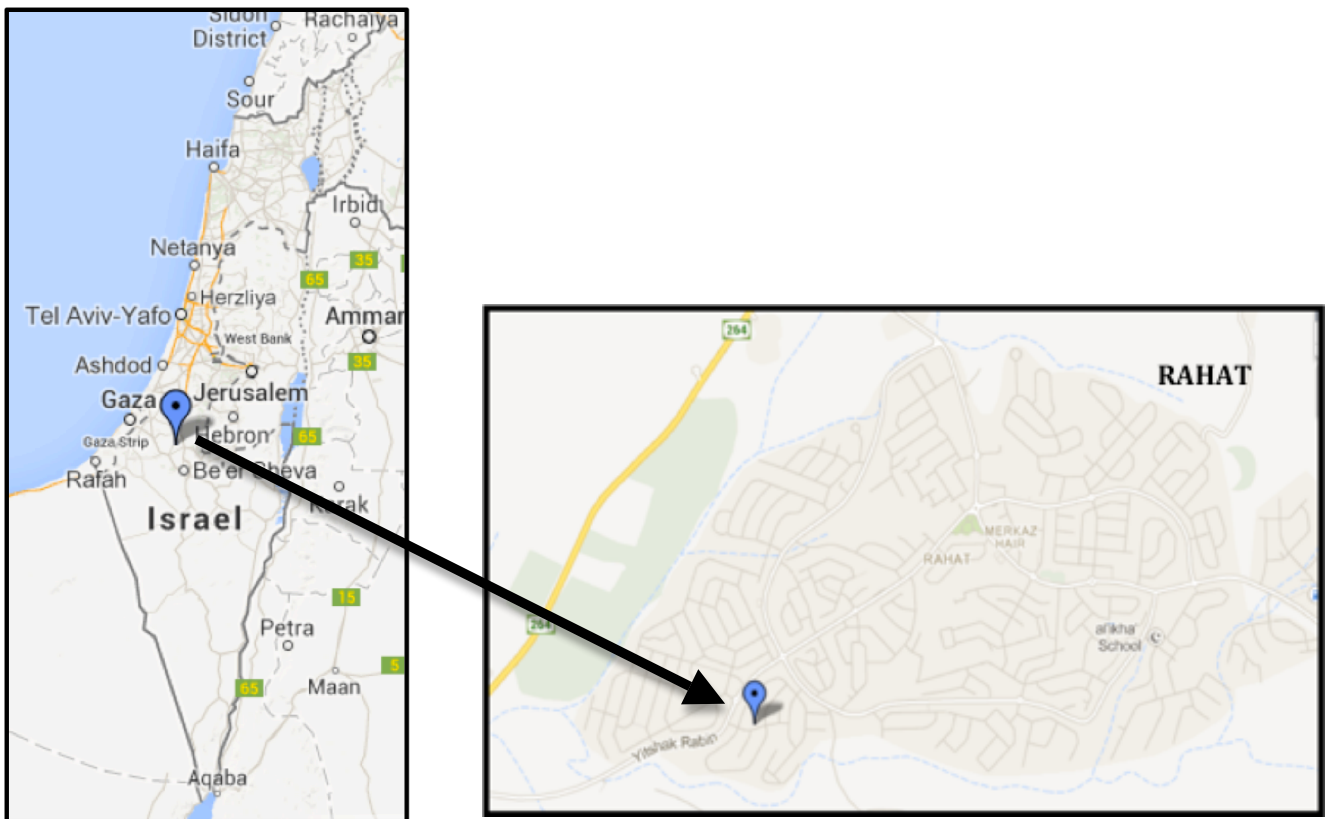
Despite Al Najach being a public facility, the manager who assumed the position of developing the gym approached the facility from an entrepreneurial standpoint. The manager received professional training in 2007 for sports facility and swimming pool management. Throughout this education, he focused on the needs of Bedouin women and their attitudes regarding physical activity. It became apparent to the manager that women in the community had an awareness of the benefits of physical activity, but they did not have the means to pursue the healthful behavior. From a marketing perspective, the manager views the implementation of women's exercise facilities as a niche for the culture. The gym is a public facility with membership subsidized by the municipality of Rahat. Women pay 100 NIS (approximately \$27.95) per month for membership. By paying this monthly membership fee, women gain access to a facility tailored to their cultural and gender specifications.

Al Najach gym is uniquely designed to meet the needs of Bedouin women. Ceiling to floor curtains shade the windows to preserve privacy. These elements adjust to meet the level of privacy that women in the gym desire while working out. With privacy controlled by the gym patrons, women feel comfortable wearing western workout apparel—without the modest covering of a hijab (head covering) or jilbab (long, loose-fitting coat) that are typically worn in public. During designated women's gym hours, men are forbidden from entering the gym; the male gym manager also adheres to this rule. (See Figure 3 for view inside the gym)

The facility offers aerobics classes in addition to open gym hours. According to the gym manager, aerobic exercise is better suited to the exercise needs of the female clientele. He also feels that women prefer to have a cardio workout, opposed to building bulky muscle achieved through the use of weight bearing equipment. After careful observation from the PI during women's gym hours, it is evident that the equipment used and the exercises performed by the

women accurately reflect the manager’s knowledge of the population. The increasing level of female gym membership can measure his marked level of expertise and cultural insight. Since the current manager took over responsibility for the gym in 2009, female gym membership has increased exponentially. The gym manager credits his professional background in gym management, his means to advertise the facility and his awareness of women’s needs in the Bedouin community for the growing success of the facility.[29] Additionally, the PI observed the manager’s respectful, personable and professional relationship that he maintains with the female gym patrons during weekly visitation. When patrons enter his office, he shakes the female athletes’ hands and welcomes them to the facility—fostering a sense of community.

**Figure 1. Gym Location: Neighborhood 34, Rahat**



**Figure 2. Al Najach Gym Hall**



**Figure 3. Inside Al Najach Gym**



## **4.2 RESEARCH METHOD**

### **4.2.1 Data Collection Tool**

Survey dissemination was selected as the method of choice for data collection for the study. Demographic information questions were adapted with slight modification from a previously distributed survey published by Morad et al.[30] It was determined that due to the incorporation of the demographic questions in a previous Bedouin health survey, the identified question set would serve a similar purpose for this cohort. Personal communication with a

Bedouin dietician and the gym manager further informed survey development. The female Bedouin dietician reviewed the survey questions to ensure cultural sensitivity of the content. It was critical to gain the perspective of a Bedouin female on the proposed question set, as some questions allude to cultural restrictions experienced by women—i.e. male accompaniment in public space. By engaging the dietician as a cultural consultant, it is believed that the chances of experiencing a low participation rate decreased.

The gym manager confirmed that Hebrew, the official language of the State of Israel, would be appropriate to use for the survey, despite Arabic being the mother tongue of the Bedouin population. A University of Pittsburgh faculty member, whose first language is Hebrew, provided expert translation of the survey from English to Hebrew. The survey was comprised of three distinct sections: consent script, basic demographic information questions and study-specific questions. Study-specific questions included both a structured and an open-ended response format. (See Appendix A & B)

#### **4.2.2 Ethical Approval**

The University of Pittsburgh granted ethical approval for this study. Due to the minimally invasive question set of the survey, the study was classified as exempt. An informed consent script was attached to the front of the survey. (See Appendix A) No identifying information was collected in the surveys. In order to gather data for BMI calculation, subjects self-reported height and weight. This method is considered to be an accepted, and accurate method of data collection in epidemiologic studies.[31]



### **4.3 PARTICIPATION RECRUITMENT**

#### **4.3.1 Translator**

In a previous visit to the Negev, the PI of this study established a relationship with a faculty member from the Department of Health Systems Management at Ben-Gurion University of the Negev. The PI worked with this faculty member to employ a salaried translator to accompany the PI to the study site and facilitate survey completion. The translator was a female, university student and a member of a neighboring (in proximity to Rahat) recognized Bedouin town, Lakiya. Gender (female) and culture (Bedouin) were important qualifications to consider throughout the recruitment process to ensure the highest level of trust between the participants and the investigator. Prior to frequenting Al Najach for survey distribution, the PI met with the translator to brief her on the study and to review the survey questions.

#### **4.3.2 Study Population and Participation Enrollment**

Women using the gym facility during the PI and translator's three visits to the gym were recruited to participate in the survey. Potential study subjects were approached upon arrival at the gym, prior to beginning their workout. Women were required to be 18 years of age or older and were only permitted to complete the survey once. The translator, who briefly explained the nature of the survey, approached each prospective participant. Prospective participants were instructed to read the consent form before determining whether or not she chose to participate in the study.

Female participants (28 subjects) were self-selected in nature based on membership to and usage of Al Najach Gym Hall. Women who were using the gym when the PI and translator visited the gym were invited to participate in the survey. A self-selected population is a satisfactory cohort for this qualitative study. Moreover, there is virtually no way of creating a random sample of Bedouin women in the Negev due to the absence of an accurate directory and strict cultural codes.[8, 9]

Throughout the survey dissemination and completion phases of the study, the PI largely removed herself from any direct line of contact with the subjects. It was determined that the female Bedouin translator, fully briefed on the questionnaire prior to the start of the study, maintained a closer cultural connection to the study subjects. As a Caucasian, Jewish university student with limited Arabic language acquisition, the PI determined that personal involvement with the subjects in the gym had the potential to jeopardize the participation rate and the quality of survey responses. While the translator distributed the questionnaire and fielded questions regarding clarity, the PI relegated herself to a corner of the gym near the entrance. By allowing the translator to assume primary responsibility for distribution and facilitation of completion—fielding survey-related questions throughout the visit—this protocol yielded very high participation rates among gym users eligible for participation. Whether or not the same results would have occurred with direct involvement from the PI during gym visitation is unknown.

### **4.3.3 Analysis**

Each survey was labeled with an identification number. All surveys were subsequently translated to English by the Hebrew faculty member at the University of Pittsburgh who was

integral in providing English to Hebrew translation of the initial survey. After survey response translation was completed, the responses were recorded in an excel database for qualitative assessment. Basic calculations such as mean, median, and proportions were calculated for the data collected.

## **5.0 RESULTS**

### **5.1 DEMOGRAPHICS**

The first portion of the survey was dedicated to collecting basic demographic information from the female participants. These results, collectively, help to create a profile of the gym user cohort and context for the remaining study-specific questions that followed.

The majority of the gym patrons, 27 women (96%), reported their age within the 18-45 year range, with the exception of one woman who reported her age between 45-65 years. All 28 women provided their marital status: 17 (61%) were married, nine (32%) were never married, one was divorced and one was a widow. Of the never-married women, 8 out of 9 respondents reported having no children; of the remaining group, 10 women (36%) reported having 3-6 children, and one woman reported having ten or more children. (Table 1)

Of the 28 participants, 20 (71%) women reported their highest level of education obtained. Of those who did report their highest level of education attained, 13 (65%) women reported having at least high school education, with five reporting that they had acquired higher education. Additionally, 11 women (39%) reported being employed and their occupation. Open-ended responses that allowed the women to further describe their employment status indicate that the majority of employed women (90%) hold a childcare-centered job such as teacher, childcare taker, counselor, or school secretary. (Table 1)

**Table 1. Demographic Summary**

<b>Demographic Information</b>		
	<b>n</b>	<b>%</b>
<b>Age</b>		
18-45 years	27	96%
45-65 years	1	4%
65 years and older	0	0%
<b>Marital Status</b>		
Never Married	9	32%
Married	17	61%
Divorced	1	4%
Widow	1	4%
<b>Children</b>		
0 children	9	32%
1-2 children	3	11%
3-6 children	10	36%
7-10 children	5	18%
10 children and above	1	4%
<b>Education Level</b>		
No formal education	2	7%
Elementary school	5	18%
High school	8	29%
Higher education	5	18%
Unknown	8	29%
<b>Employment Status</b>		
Employed	11	39%
Unemployed	15	54%
Unknown	2	7%

In addition to general demographics, the survey included questions regarding the participants’ self-reported general health. The survey asked women to self-record their height and weight. Through simple calculation using the BMI formula:

$$\text{BMI} = \text{weight (kg)} \div \text{height (m)}^2$$

the raw data was calculated to generate a BMI measurement for each gym user. The mean BMI for the group was 26.4, with a median of 26.2. A total of 25 women responded to this question; over half (56%) had a BMI that qualified as overweight ( $\text{BMI} \geq 25 \text{ kg/m}^2$ ), with almost one-quarter of this group of women meeting criteria for obesity ( $\text{BMI} \geq 30 \text{ kg/m}^2$ ). However, a

marked subset of the cohort, ten women (36%), reported a healthy BMI. When reporting their general health, most women responded with a positive attitude toward their well-being. None of the women reported having poor health, and 26 women (93%) reported having good health or better. (Table 2)

**Table 2. Self-Reported Health**

<b>Self-Reported Health</b>		
	<b>n</b>	<b>%</b>
<b>BMI</b>		
Underweight	1	4%
Healthy weight	10	36%
Overweight	8	29%
Obese	6	21%
Unknown	3	11%
<b>General Health</b>		
Poor	0	0%
Fair	2	7%
Good	6	21%
Very Good	7	25%
Excellent	13	46%

## 5.2 GYM RELATED SURVEY RESULTS

The remaining results describe the women’s experiences and attitudes toward Al Najach Gym Hall and healthy lifestyle behavior.

The women in this study reported holding gym memberships for a range of time—from their first day to three years. Most women, 20 out of 26 respondents (77%), described learning about the gym from family members or female friends who recommended the facility. On average, 26 women from the cohort reported frequenting the gym approximately three times per week, and 24 women reported exercising for an average of one hour per session. For two of the

women surveyed, it was their first time attending the gym, and therefore, could not contribute to the cohort average. (Table 3) When asked to rank (on a five-level Likert scale) the importance of frequenting the gym as part of their weekly routine, 21 out of 27 (78%) women reported a score of either four or a five (with five being the most valued score) placed on importance. (Table 4)

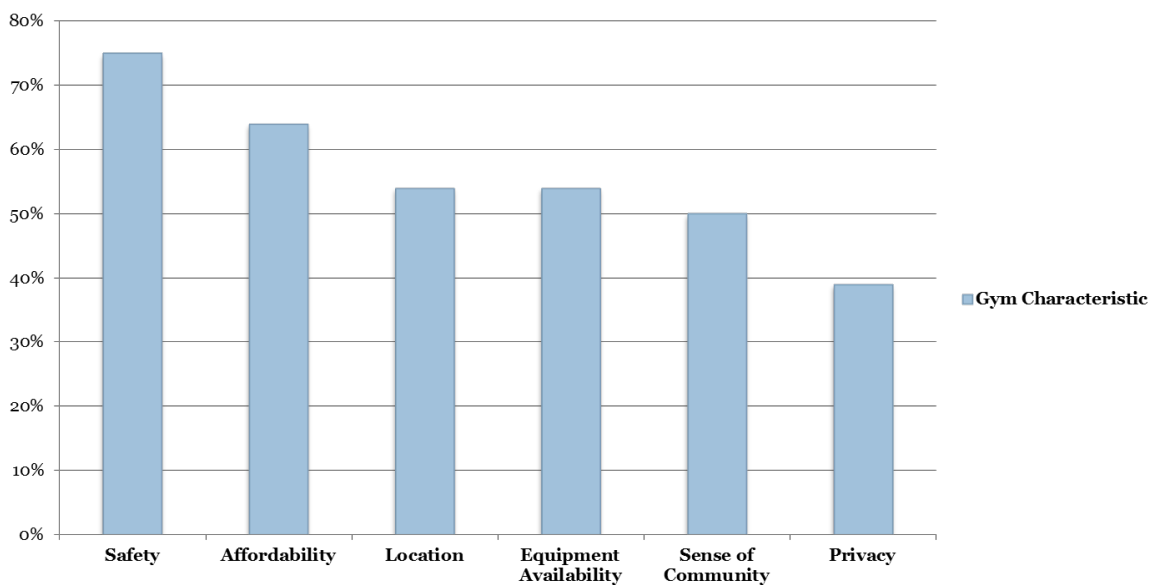
Women reported using various modes of transportation to get to the gym; the majority, (17 women out of 26 respondents, 65%), reported that they walk. Others reported using the public bus (9 women, 15%) or a private car (9 women, 15%). However, because the urban environment can serve as a restrictive space for female mobility, some women cannot utilize these modes of transportation independently. One way to expand a woman's permitted terrain is through the accompaniment of a related male—i.e. husband, father or brother. When arriving at the gym, 18 (64%) women definitively reported arriving at the gym unaccompanied by a male. Conversely, one woman definitively reported that a male *does* accompany her to the gym, and if a male is not present to escort her, she cannot go.

The series of questions regarding male accompaniment yielded a high number of inconsistent responses. In total, nine responses reported contradictory answers that could not be used to draw conclusive results describing the gender dynamic as a barrier to the gym commute. Inconsistent answers were identified as two types: 1.) Women reported not needing a male to accompany them to the gym, but then answered that if a male is not present, they cannot attend or 2.) Women reported needing a male to accompany them to the gym, but if a male is not present, she can still attend.

Women were asked to identify which characteristics of the gym (selecting all that apply) they value from a list of six features: 1.) Ability to exercise in privacy 2.) Affordability 3.) Sense of community 4.) Location 5.) Safety and 6.) Equipment availability. Respondents were most

receptive to the safety and affordability of the facility. The women identified safety as the most valued characteristic, with 21 out of 28 (75%) women choosing this feature. Affordability ranked second highest among the characteristics of the gym that women valued, with 18 out of 28 women (64%) selecting this feature. Additionally, when asked to evaluate gym membership affordability on a five-level Likert scale, over half of the women, 15 out of 28 (54%) reported a “one” or “two,” which describes the gym as very affordable/affordable. (Figure 4 and Table 4)

**Figure 4. Perceived Importance of Gym Characteristics**



When asked to quantify (on a five-level Likert scale) the importance of physical activity in one’s weekly routine, a large majority of women, 24 out of 28 participants (86%), ranked physical activity with the highest ratings—a “four” or “five.” In regard to exercising outside of the gym setting, the cohort was evenly split regarding their exercise behavior. Half of the women reported incorporating alternative physical activity methods into their exercise regimens outside of the gym; 13 women reported exercising outside of the facility and 13 women reported no physical activity outside of the facility. Women who reported being physically active outside of Al Najach describe walking with other women as well as dancing, aerobics, and core



strengthening exercises suitable for the home or neighborhood setting. For those women who do not exercise outside of the gym, no data was collected to ascertain a reason (barriers to physical activity) for inactivity in the domestic sphere.

Barriers to achieving a healthy lifestyle, specifically access to the local gym and barriers to a healthful diet, were assessed in this survey. The women who frequent the gym identified barriers that impede on their ideal gym attendance and described alternative exercise methods executed outside of the gym. Childcare, work responsibilities and academic studies represent common barriers identified by the cohort. Women prioritize their children, employment and education higher than their gym attendance, which in turn can decrease availability in their schedule for physical activity. Less frequently expressed barriers to gym attendance included insufficient public transportation and a sense of unease from onlookers while walking to the gym.

Dietary practice was the final aspect of healthy lifestyle behavior evaluated in the survey. Overall, the female cohort placed more importance on physical activity and gym attendance than eating healthfully. Among the women who rated the importance of diet, 19 out of 27 women (68%) reported its value as a “four” or “five” (highly rated) on a five-level Likert scale. Overall, more women rated physical activity and gym attendance with greater importance in their daily lives. When asked to identify what challenges the women face toward eating healthfully, responses varied widely. Among the 24 women who provided responses, five women reported facing no problems to eating healthfully. However, among the remaining cohort responses, three major barriers reoccurred throughout the open-ended answers: time constraints, pregnancy and traditional cooking practices. (Table 4)

Table 3. Self-Reported Gym Attendance

Self-Reported Average Gym Attendance per Week		
	n	%
<b>Number of times in the gym per week</b>		
1	2	7%
2	6	21%
3	17	61%
4	0	0%
5	1	4%
Other*	2	7%
<b>Number of minutes spent exercising at the gym per visit</b>		
0-20	1	4%
21-40	7	25%
41-60	7	25%
61-80	0	0%
81-100	9	32%
Unknown	2	8%
Other*	2	8%

\* Indicates first time at gym

Table 4. Importance of Healthy Lifestyle Choices

Rating the Importance of Healthy Lifestyle Choices			
		n	%
<b>Importance of attending the gym in weekly routine*</b>			
1		1	4%
2		3	11%
3		2	7%
4		5	18%
5		16	57%
unknown		1	4%
<b>Importance of physical activity in weekly routine*</b>			
1		1	4%
2		0	0%
3		3	11%
4		4	14%
5		20	71%
unknown		1	4%
<b>Importance of eating healthfully*</b>			
1		0	0%
2		2	7%
3		6	21%
4		3	11%
5		16	57%
unknown		1	4%

\* The ranking for these questions was based on a five-level Likert scale, in which 1 was the lowest value and 5 was the highest value assigned to responses.

## 6.0 DISCUSSION

This study was conducted at a critical time for the health of the urbanized Bedouin population, especially as it relates to the unparalleled impact that women in the culture endure. The detrimental health effects of abruptly transitioning from a semi-nomadic lifestyle to an obesogenic environment have compounded over decades of time, and today obesity related chronic disease is surfacing at unprecedented rates among the population. The urban environment serves as a spatially deterministic space. Consequently, this urban design restricts female mobility and limits autonomy as families strive to preserve female modesty and family honor in the presence of unrelated tribes. A temporal correlation exists between the displacement of Bedouin into an urbanized setting and the rising levels of obesity related chronic disease. Two predominant lifestyle characteristics contribute to weight gain: increased caloric intake and decreased physical activity. To date, literature on Bedouin health focuses on the former, and studies regarding physical activity among urbanized Bedouin are almost entirely absent from academic discourse.

Al Najach Gym Hall in Rahat, Israel presented an opportunity to investigate this public health issue and to evaluate the viability of the current solution. The Al Najach gym facility serves as the sole gym among the Bedouin towns designed to cater specifically to the female demographic. Implementing a gym in an urban environment is not a unique or innovative amenity. What makes this phenomenon worthy of study is its newly perceived relevance in Bedouin society. In particular, Al Najach serves as a prototype facility that is defining a niche environment for women's health. When surveying the women about their physical activity habits

and gym interaction, high participation rates and prioritization of the gym in the women's weekly schedules suggest that the facility is well received among its female users.

Key modifications to basic gym design and management define the female-centric environment, and in turn enable participation. The gender-conscious elements of the gym do not require substantial monetary investment, which should encourage the replication of Al Najach in other locations within Rahat and among neighboring towns. Long curtains cover the windows of the facility and can be adjusted to suit the privacy or safety needs of the female athlete. These curtains prevent outsiders from observing the gym patrons exercising in the facility, and allow the women to be in control of their environment. With this element of privacy established, women disrobe from their jilbab and exercise in workout apparel consistent with that of western culture. During gym hours, the male manager is not permitted to access the workout area. The codification of Bedouin culture in the public space exemplifies how post-modern, participatory planning of a town amenity can serve the female demographic in beneficial ways.

In capturing the age profile of the cohort, 18-45 years of age represented the youngest age bracket in which women could identify on the survey. Also, it is the age bracket in which almost the entire survey cohort populated. Additionally, 18-45 and 45-65, pre-determined age ranges of the survey design, straddle the age brackets of two distinct subpopulations of Bedouin women. Meir and Gekker define these two social groups as the *second urbanized generation* comprised of women 24-30 years, and the *displaced generation* comprised of women 30-65 years. The title "second urbanized generation" refers to the subset of Bedouin who have experienced living in an urbanized environment their entire lives. In contrast, the "displaced generation" characterizes Bedouin who lived and married in tribal territories prior to the government urbanization project responsible for relocating them.[9] The age profile of the cohort who uses the gym is consistent

with the contrasting mentalities and lifestyles maintained by the two urbanized sub-populations. Older women have a tendency to cultivate lifestyles indicative of their collective, nomadic past: caring for livestock and preparing meals. However, for younger generations—approximately 20 to 40 years of age—Bedouin women are adopting more westernized ways of life, while attempting to “bridge the generational, spatial, and cultural divisions that separate their mothers, children, husbands and friends.”[10]

Although it is difficult to definitively categorize the women who comprise the study cohort into either group (displaced generation versus second urbanized generation) due to the predetermined age categories on the survey, Meir and Gekker provide additional criteria that help to characterize each generation respectively. Besides age, the authors associate higher levels of education acquisition (high school and college) as a phenomenon predominately seen among the second urbanized generation.[9] According to survey results, 46% of respondents attained higher education through pursuing a high school diploma or college studies. To further validate the perceived presence of a second urbanized generation one should consider the pronounced number of employed women in the cohort—39% of respondents. Educated and employed female Bedouin represents a relatively new and growing phenomenon in society.[7, 11, 28] This realized autonomy gained through education could be an attitude transcendent into related aspects of lifestyle, such as physical activity.

It should be emphasized, however, that the significant number of women who have attained a high school education—let alone higher education—in the study sample is not characteristic of the broader female Bedouin population. Data published in 2012 by the Myers-JDC-Brookdale Institute (MJB) substantiate this discrepancy. According to MJB, the average amount of education among Bedouin women 15 years of age or older was six and a half years in

2007. This figure more than doubled in 17 years, when in 1990 the average amount of education attained was only three years. As educational attainment among Bedouin women continues to increase, dropout rates have decreased; in the past decade, dropout rates have decreased 10%, from 42-32%. Moreover, data from 2010 reports that the matriculation rate for high school aged Bedouin girls was 28%—a 15% increase since 1999. In 2008, the employment rate for urbanized Bedouin women was reported to be 14%.[32]

The unique composition of the study sample becomes more evident when compared to the Bedouin population at large. Many women in the cohort (13 women) have at least double the average level of education of the overall female population, and the employment rate of the study sample more than doubles that of the overall average. Among the urbanized Bedouin population, a positive correlation exists between the education level of the female demographic and awareness and use of social services—especially healthcare resources.[10] [3] Moreover, the longitudinal survey work of Dinero, conducted in Segev Shalom from 1993 to 2007, depicts an unprecedented number of women accessing modern amenities, mainly education, over the past decade from 1996 to 2007.[10] These complementary trends provide a rationale for the prominent presence of educated and employed women utilizing the gym, a novel health resource in the Bedouin community.

One female role that remains steadfast in Bedouin society is that of wife, and further as mother. Survey results indicate that 69% of the gym users who participated in the study are married, or had been married. Furthermore, 75% of the women are mothers with families ranging in size from one child to over ten children. In Israeli society, the Arab fertility rate is decreasing.[7] Among study participants, the majority of women, 57% of the sample, have at least 3 children. As for the greater Beer Sheva sub-district, the total fertility rate of the Muslim

population is 6.91 children per mother compared to the overall Muslim population in Israel that is reported to have a total fertility rate of 3.84 per mother.[33] Considering the above demographic information, it becomes apparent that Bedouin women are experiencing dynamic changes in lifestyle as a transitioning, urbanized population through their access to westernized, societal resources. However, the revered role of motherhood reflected in the cohort family size remains a distinctive characteristic of the Bedouin culture that influenced how women prioritize their gym usage.

The BMI data collected in the survey captures the marked level of overweight women who participated in the study cohort. As stated earlier, 56% of the women who provided their height and weight were determined overweight (BMI of 25 or higher). The pronounced prevalence of overweight/obesity reported among the gym users is consistent with large data sets that compare overweight and obesity rates between Arab and Jewish females. According to ICDC data from 2011, the percentage of obese Arab women (41.2%) was almost double that of their Jewish counterpart (22.2%). The report further describes that the disparity in weight gain between the female populations begins to surface around age 25.[7] The longitudinal research in Segev Shalom substantiates these trends specifically among an urbanized Bedouin population. An internist in the community explains how the acute lifestyle transition incurred by the formerly semi-nomadic people helps to account for the marked levels of obesity related chronic disease: “Doctors who treated the Bedouin in the 1960s had ten patients with diabetes, and less than five had hypertension in the whole Negev. [...] Today we have an epidemic of diabetes and hypertension, more than the Jewish sector.” [10] Due to the modest cohort size, the prevalence of overweight and obesity might be overstated; however, it nevertheless indicates an excess weight issue among a seemingly health conscious subset of Arab women in Bedouin culture. Moreover,

it is intriguing to capture similar trends in obesity related chronic disease among Segev Shalom, a community that does not have an exercise facility—let alone a gym designed for women—and Rahat. This comparison warrants further exploration into the barriers that female citizens in Rahat face toward gym access.

When analyzing barriers the women face toward accessing the gym, the pressure to balance educational opportunities, employment and child rearing impedes on the female's ability to incorporate physical activity into their lives. These barriers were indicated through open-ended survey responses. When asked about what makes it difficult to get to the gym in their daily routine, responsibilities related to childcare serve as the primary response. One way some gym-users overcome this challenge is by bringing their children to the gym. Through observation at the facility, it became apparent that, at times, Al Najach was a fully functioning gym and pseudo-daycare center in the same space. Work pressure and academic studies also appear as common responses. In contrast to former female Bedouin obligations as a semi-nomadic society, women today must now prioritize what was once an inherent fixture in their everyday lives—physical activity—among their duties today as wives, mothers, students and employees. This role pressure reflects the challenges of westernized women around the world.

Another barrier alludes to social-structural barriers embedded in the urban environment. As discussed earlier, the territorially charged public space can be an unwelcoming environment for women. Fenster explains that at times, “[restriction] in movement means that these women feel unable to use even social and welfare services, located outside their neighborhoods.”[6] This narration of hostility toward females in the urban environment speaks directly to one woman's experience while walking to the gym. When asked about what makes it difficult to get to the gym



in her daily routine, one woman did not mention her children or work pressure, but instead responded that “people look at her” during her walk to the facility.

Unpleasant encounters while walking or exercising in public space is not unusual in Bedouin society, and accounts of restriction on female mobility appear in literature time and again. A similar study from 2008 addressing physical activity levels among the Arab population of Israel reports that women experience verbally abusive language and become subjected to town gossip while attempting to engage in physical activity in a community setting.[1] The internist from Segev Shalom interviewed in Dinero’s research reports further impediments on female mobility: “[Women] are not allowed to jog or walk in the streets on their own so they sit at home.”[10] Some discrepancy in regarding the extent of female Bedouin autonomy exists among various sources and the study data presented. This suggests that cultural norms centered on physical activity and social mobility are dynamic, and evolving in response to environmental changes.

From the data collected, it appears that women have found alternative ways to mitigate perceived animosity from onlookers in the town. One woman reported that a male (family member or spouse) accompanies her to the facility; without whom, she cannot utilize the public amenity. Additionally, half of the women report exercising in alternative ways outside of the gym such as through dance, aerobics and core strengthening exercises. Four responses specifically mention “home” in the written answer. The permanent Bedouin home is constructed by the execution of gender planning and provides an inherently safe space for women through internal spatial division of the house—delineating private and public spheres.[9] It is apparent that the modifications to the gym are intentionally made to foster a similar sense of security. Other women discuss walking outside, and one woman specifically mentions walking with other

women. Walking in a group heightens female anonymity and makes it more apparent that the women are exercising—both aspects mitigate the possibility for the town to gossip about their atypical behavior (relative to the norms of Bedouin culture).[9]

When asked to identify the characteristics of the gym the participant values, safety ranked highest among the six components. Whether the women are working out in the domestic sphere or in Al Najach, a sense of safety a necessary attribute to establish. The data depicting the number of women who work out outside of the gym indicates that only half of the women seek alternative forms of exercise. Although the survey did not ask women to identify the barriers they face while exercising outside of the gym, a lack of safety—the perceived level of privacy—would logically follow from the results provided. An expansion of the survey would benefit from the addition of questions designed to ascertain information regarding barriers women face while pursuing physical activity outside of the gym. These results would broaden the applicability of the survey results to apply more aptly to other urbanized Bedouin communities that do not have a gym facility like Al Najach. Further limitations of the study are explained in detail below.

## **6.1 LIMITATIONS**

Due to the small sample size, this study is unable to be used to make general extrapolations about the population. However, because Bedouin health literature is lacking insight into women's physical activity levels overall and gym usage in particular, the results of this study will provide future investigators with a foundation to inform further inquiry. One way to improve the quality of descriptive demographic statistics, without increasing the sample size, would be to modify further the adopted question set. For example, directly asking women for

their age, rather than relying on broad categories, would provide a more in-depth perspective of the gym patron profile. However, as a PI relatively foreign to the study population, it was decided that initial survey questions (appearing earlier) should remain as neutral and sensitive as possible in an attempt to establish trust with the subject and to maintain the participant's compliance throughout the study.

In addition to increasing the sample size in future studies, it will also be important to diversify the type of participant. The current study only profiles Bedouin women who have access to and utilize the gym. Therefore, this study does not provide insight as to what barriers are keeping women who do not hold a gym membership from attending. Identifying such barriers would provide individuals invested in promoting physical activity in Bedouin society with vital information that this survey does not capture.

Similarly, among the women who utilize the gym and participated in the survey, half of the cohort does not execute physical activity outside of the gym facility. The survey developed for this study did not ask participants to provide rationale for this lack of activity in the domestic sphere. These results suggest a significant disconnect between exercising in a designated public facility and exercising within their homes or within a residential setting. Further insight to explain this phenomenon would serve to inform translational public health interventions designed to target women outside of the gym. Until Al Najach is replicated in other recognized Bedouin towns, understanding the barriers to physical activity that women identify will serve to facilitate a successful intervention among the broader female Bedouin demographic in the Negev.

In evaluating the survey responses, it is evident that the confluence of languages—English, Hebrew, and Arabic—jeopardized the quality of some survey responses. Although the

gym manager recommended Hebrew as an appropriate language in which to conduct the survey, determined by the high literacy rate of the users, some survey responses suggest unsatisfactory levels of comprehension. It is unclear whether the same quality of results would have been collected if the survey was published in Arabic. Overall, a more thorough review of survey results on-site by the translator and PI would have likely improved the response rates and quality of some key questions.

## **6.2 CONCLUSION**

The survey conducted at Al Najach Gym Hall was modest in size and scope; however, it was the first of its kind. Al Najach is an innovative amenity implemented in Bedouin society dedicated to improving the health and wellness of women in Rahat. This exploratory study aimed to investigate how Bedouin women incorporate Al Najach Gym Hall, and overall healthy lifestyle practices in their lives. The simple, yet female-centric modifications made to ensure women's comfort and security within the facility has the potential to be replicated throughout the city and in neighboring towns. As women become more integrated into mainstream society through educational opportunities and employment, the westernized concept of gym culture becomes a more alluring practice to incorporate into their weekly routines.

The demographic information, survey responses and observations recorded at the gym serve to inform researchers, medical professionals and community leaders working to improve the health of Bedouin women. Education levels and employment status suggest that Bedouin women are becoming more present in the public sphere. To further encourage sustainable social change, structural modifications to the urban setting should be considered in an attempt to

mitigate the barriers to gym access and related healthy lifestyle practices identified in this study. Although overarching and recurrent themes expressed by the surveyed women regarding social and environmental barriers warrant further investigation, simply identifying restrictive mechanisms can help to inform affective solution development.

### **6.3 FUTURE DIRECTIONS**

With or without the study data presented, Bedouin culture is characterized by large family size. However, what has changed through processes of urbanization is the challenge of prioritizing traditional, female Bedouin roles with new academic, employment and physical activity opportunities. Rather than forcing women to choose one over the other, and in turn jeopardizing her newly realized autonomy, resources should be made available to facilitate balance. As observed in Al Najach, many mothers bring their children to the gym, and the children play on the equipment while the mothers exercise. While this compromise unequivocally creates a chaotic environment, women can successfully fulfill their responsibilities as mothers without sacrificing their health. By providing a more formal childcare setting in Al Najach or future, all-female Bedouin gyms, the exercise facility might become a more marketable and attractive environment for both mother and child.

Managing gym attendance during periods of time-consuming academic studies surfaced as another challenge that women struggled to resolve. Although by many standards the prioritization of academic assignments over physical activity is acceptable, women should have access to facilities that promote exercising both the mind and the body. One possible solution could be for high schools and universities to provide gyms that mirror Al Najach. Westernized

academic institutions often have an accompanying gym with open-access for its students, or even classes designed to perfect gym use. Creating female-centric gyms in the public space of academic institutions presents a post-modern solution for Bedouin women in an otherwise restrictive environment determined by modern design. This solution has the potential to *increase* the woman's range of public mobility, her presence in society and her level of physical activity.

Barriers to gym access due to lack of transportation or male permission could not be fully measured in this survey; all participants completed the survey having accessed the facility. Despite this limitation, the female participants managed to express definite challenges that they encounter in the city: lack of consistent public transportation, harassment from passersby and need for male accompaniment. It can be inferred that these restrictions to gym access might be more apparent in the lives of women who do not belong to the facility. Implementation of a van service could serve to mitigate the aforementioned barriers. A shuttle service could cater to women by providing door-to-door transportation that would deliver them to and from the gym on designated days. In turn, this routine and consistent mode of transportation would translate into routine and consistent gym-users.

Al Najach Gym Hall provides women with the means to execute a healthful lifestyle through physical activity in a safe, communal environment for women. The goal of this research was to identify how the users perceive this innovative facility in Bedouin society and their daily lives. Women's survey responses provided insightful information regarding the challenges they face in using the facility and in executing healthy lifestyles. By making this data accessible to researchers, medical professionals and community leaders, informed decision making can lead to transformative health solutions for Bedouin women.

## APPENDIX A

### CONSENT SCRIPT

The purpose of this research is to identify social and environmental barriers urbanized Bedouin women face in attempt achieve healthy lifestyle practices—such as utilization of Ha Najah gym in Rahat, Israel. For this reason, I am administering a survey to female members of this gym who are age 18 years of age or older. Participation in and completion this survey will use approximately 15 minutes of your time. Willing participants will be asked to answer basic questions about themselves (age, level of education, family background) as well as questions addressing gym utilization, alternative forms of exercise value of health. There are no foreseeable risks associated with this project, nor are there any direct benefits to you. You will not receive any payment for participation. This survey is entirely anonymous, and so your responses will not be identifiable in any way. All responses are confidential and will be safeguarded at all times. Your participation is voluntary, and you may choose to skip any question that you do not feel comfortable answering; you may withdraw at any time. Elizabeth Mitgang is conducting this study, and she can be reached at [mitgang25@gmail.com](mailto:mitgang25@gmail.com), if you have any questions.

## APPENDIX B

### AL NAJACH GYM HALL SURVEY

Please provide the following general information:

**1. Age**

18 – 45 years \_\_\_\_\_

45 – 65 years \_\_\_\_\_

65 + years \_\_\_\_\_

**2. Marital status:**

Never married \_\_\_\_\_

Married \_\_\_\_\_

Divorced \_\_\_\_\_

Widow \_\_\_\_\_

**3. If married, what is your husband's level of education?**

Does not apply \_\_\_\_\_

No formal education \_\_\_\_\_

Elementary school \_\_\_\_\_

Part of high school \_\_\_\_\_

Graduated high school \_\_\_\_\_



Higher education \_\_\_\_\_

4. **Is your husband employed?** Yes \_\_\_ No \_\_\_ Does not apply \_\_\_

**If yes, please describe his occupation below:**

**5. Personal level of education:**

No formal education \_\_\_\_\_

Elementary school \_\_\_\_\_

Part of high school \_\_\_\_\_

Graduated high school \_\_\_\_\_

Higher education \_\_\_\_\_

6. **Are you employed?** Yes \_\_\_ No \_\_\_

**If yes, please describe your occupation below:**

**7. Number of children:**

0 children \_\_\_\_\_

1 – 2 children \_\_\_\_\_

3 – 6 children \_\_\_\_\_

7 – 10 children \_\_\_\_\_

More than 10 children \_\_\_\_\_

**8. Self reported height and weight:**

Height: \_\_\_\_\_ meters      Weight: \_\_\_\_\_ kilograms

**9. Would you say that in general your health is: (check one)**

Excellent      \_\_\_\_\_

Very good      \_\_\_\_\_

Good      \_\_\_\_\_

Fair      \_\_\_\_\_

Poor      \_\_\_\_\_

Now we would like to ask you about the Ha Najah Gym and your exercise habits:

**10. When did you begin utilizing Ha Najah gym?**

Approximate date (or number of months/years): \_\_\_\_\_

**11. How did you learn about the Ha Najah gym?**

**12. Please indicate what you like most about the gym (*check all as appropriate*):**

Ability to exercise in private      \_\_\_\_\_

Affordability      \_\_\_\_\_

Sense of community      \_\_\_\_\_

Location \_\_\_\_\_

Safety \_\_\_\_\_

Availability of exercise equipment \_\_\_\_\_

Other (please describe)

**13. During the past 3 months, on average, how often did you go to the gym?**

1 time per week \_\_\_\_\_

2 times per week \_\_\_\_\_

3 times per week \_\_\_\_\_

4 times per week \_\_\_\_\_

5 times per week \_\_\_\_\_

6 times per week \_\_\_\_\_

7 times per week \_\_\_\_\_

**14. During the past 3 months, on average, how many minutes did you exercise at the gym each time you attended?**

\_\_\_\_\_ minutes

**15. How do you travel to the gym?**

Walk \_\_\_\_\_ Bus \_\_\_\_\_ Car \_\_\_\_\_ Other \_\_\_\_\_ (Please describe below)

Other:

**16. What is the approximate distance that you travel to the gym?**

**17. Does a male family member escort you to the gym?**

Yes \_\_\_ No \_\_\_

*If yes, please answer question 15:*

**If a male family member cannot escort you to the gym, do you still attend?**

Yes \_\_\_ No \_\_\_

**18. Do you exercise outside of the gym? Yes \_\_\_ No \_\_\_**

**If yes, what type of exercise do you do? *Please describe below***

**If yes, on average how often during the past 3 months did you exercise outside of the gym?**

1 time per week \_\_\_

2 times per week \_\_\_

3 times per week \_\_\_

4 times per week \_\_\_

5 times per week \_\_\_

6 times per week \_\_\_

7 times per week \_\_\_

**On average, how many minutes were you active each time you exercised outside the gym during the past 3 months? \_\_\_\_\_ minutes**

*Finally, please answer a few additional questions about your lifestyle perceptions:*

- 19. On a scale of 1 – 5, how do you perceive the cost of attending the gym?  
*Please circle a number to indicate importance***

**Not Affordable      1      2      3      4      5      Very Affordable**

- 20. On a scale of 1 – 5, how important is attending the gym in your weekly routine?  
*Please circle a number to indicate importance***

**Not important      1      2      3      4      5      Very Important**

- 21. On a scale of 1 – 5, how important is physical activity in your weekly routine?  
*Please circle a number to indicate importance***

**Not important      1      2      3      4      5      Very Important**

- 22. In your daily routine, what makes it difficult to get to the gym?  
*Please describe below:***

- 23. On a scale of 1 – 5, how important is eating healthfully?  
*Please circle a number to indicate importance***

**Not important      1      2      3      4      5      Very Important**

**24. In your daily routine, what makes it difficult to eat healthfully?**

*Please describe below:*

**Thank you very much for completing this survey!**

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