

A DESCRIPTIVE STUDY OF WOMEN ENGAGED IN STRENGTH TRAINING

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ABSTRACT:

Background- Although the well-established health benefits of regular physical exercise and structured training programs are indisputable, women remain underrepresented in gym settings, with an even smaller proportion participating in strength and resistance training. Diverse motivations drive women to initiate such regimens, yet they encounter distinct barriers and influencing factors that shape their adherence. Engagement in resistance training often prompts notable physiological adaptations and shifts in body image and self-perception among women. Contemporary societal norms increasingly endorse women's pursuit of physical challenges, including strength training. Scientific evidence and advocacy have fueled rising awareness and acceptance of resistance training among women, empowering greater numbers to attain its key health and performance advantages.

Objectives and Aim- This study aims to explore self-reported health benefits such as improvements in muscle strength, body changes, and metabolic health among women. The objectives are to identify these benefits from participants' practices

Method- This quantitative, cross-sectional descriptive study surveyed 384 women engaged in strength training (≥ 2 sessions/week for ≥ 6 months) across fitness centers in the Delhi NCR, India. Data were collected using a validated, self-administered Likert-scale questionnaire (Cronbach's $\alpha = 0.92$) and analyzed using descriptive statistics via SPSS.

Result- Participants reported profound multi-dimensional health gains, with psychological and metabolic improvements significantly overshadowing traditional aesthetic motivations. The highest levels of agreement were observed in increased body confidence (95%), enhanced mental resilience (93%), increased lifting capacity (92%), higher daily energy levels (90%), and improved sleep quality (87%). Conversely, reduction in body fat (72%) showed comparatively lower agreement. Demographically, the majority of participants were highly educated (72.9% holding undergraduate degrees or higher), privately employed (43.8%), and consistently trained 3-4 times per week (38.0%).

Conclusion- Strength training serves as a holistic health intervention for women, yielding substantial psychological empowerment, functional autonomy, and metabolic vitality. However, despite these undeniable benefits, sustaining long-term adherence requires overcoming systemic obstacles such as occupational fatigue and work-family time constraints. Public health strategies must shift toward fostering flexible, inclusive fitness environments and workplace wellness initiatives to promote lifelong musculoskeletal health in women.

KEYWORDS: Strength training, Resistance exercise, Health benefits, Exercise barriers, Gym Training

INTRODUCTION

Background: Resistance training, often referred to as strength training, has established itself as a crucial aspect of promoting women's health, yielding diverse advantages throughout different phases of life. Recent research emphasis on how strength training impacts women overall health, the overall changes in muscle mass and fat distribution.¹

Many researches also mention about the psychological changes, positive body image development, boosting of confidence and self-esteem. It also overlooks the unique psychological and social factors that impact women's participation and consistency to strength training.²

Muscular strength refers to the maximum force an individual can produce during a particular movement at a given speed of contraction. The display of peak strength relies on various factors, including the form of muscle action (such as concentric, eccentric, or isometric), the extent of joint motion, the rate of contraction, and numerous physiological and biomechanical characteristics that allow for the generation of high forces and the handling of heavy weights.³

Organized resistance training protocols have exhibited advantages in augmenting muscular power and alleviating subjective stress perceptions, thereby facilitating enhanced autonomy in daily functioning.⁴

Resistance-based exercise plays an important role in maintaining women's health, particularly in preventing muscle loss and osteoporosis associated with aging. Evidence shows that regular strength training can improve bone mineral density, lower the risk of cardiovascular disease by nearly 30%, and support better metabolic functioning. In addition, it may

help reduce symptoms related to menopause, enhance psychological well-being, and maintain physical capability for daily activities. By supporting strength and mobility, such training contributes to long-term independence, overall health, and an improved quality of life.^{5,6}

Women practicing strength training self-report significant improvements in body image, self-esteem, and quality of life. Participants describe feelings of empowerment and autonomy, alongside reduced anxiety, stress, and depressive symptoms. Physical perceptions include enhanced vitality, better sleep quality, and increased confidence in performing activities of daily living.^{7,8}

Increasingly, women engage in strength training to improve bone density and metabolic health. However, participation remains low due to barriers like perceived time constraints, lack of equipment knowledge, and intimidation in male-dominated gym spaces. Pervasive misconceptions, such as the fear of becoming "bulky" or the belief that cardio is superior for weight loss, further deter engagement despite evidence that resistance training fosters a lean, functional physique.^{9,10,11}

Recent studies indicate that women increasingly favor plant-based and Mediterranean-style dietary patterns to support metabolic health and hormonal balance. While women often exhibit higher eating discipline than men, they face unique barriers to strength training, including gender-based social stigmas and time constraints due to family roles. Optimal training frequency is identified as at least twice weekly, which effectively mitigates age-related muscle loss. Motivation is primarily driven by perceived health benefits and social support networks rather than purely aesthetic goals.^{12,13,14}

This study is grounded in the recognition of a long-standing gender imbalance in exercise science, where resistance training research has largely concentrated on male participants. As a result, there remains a shortage of female-specific evidence on exercise adherence and the ways in which strength training fits into women's daily lifestyles. Although recent trends indicate that many women are increasingly emphasizing functional strength rather than purely aesthetic fitness goals, there is still limited descriptive information about how training frequency and dietary habits interact with challenges unique to women, such as hormonal changes and feelings of anxiety in gym environments. By examining these patterns, the present study aims to generate data that can help shift fitness recommendations from generalized advice to more evidence-informed and inclusive strategies that promote sustainable musculoskeletal and metabolic health among women and also to motivate them to focus on their physical health and mental wellbeing.

Objectives

To identify self-reported health benefits, including improvements in muscle strength, body changes, and metabolic health, from participants' strength training practices.

Purpose

To examine self-reported physiological gains among women engaged in resistance training. To assess perceived improvements in metabolic parameters including energy metabolism, and aerobic endurance through regular strength training. To highlight the medical significance of these self-perceived benefits in promoting long-term musculoskeletal health and metabolic wellness in women. To evaluate the psychological adaptations induced by strength training, including enhanced body image satisfaction, elevated self-esteem, and improved stress resilience in women.

METHODOLOGY

This quantitative, cross-sectional descriptive study was designed to explore self-reported health benefits among women engaged in strength training, focusing on physiological, metabolic, and psychological outcomes. Data collection occurred over a three-month period (January-March 2026) at various gym and fitness centers in the Delhi National Capital Region (NCR), India, selected for their accessibility and concentration of female participants actively involved in resistance exercises. The target population consisted of adult women (aged 18-50 years) undergoing regular strength training for at least six months. Employing purposive sampling to ensure representation of diverse training levels and demographics, a sample of 384 participants was recruited, determined via Cochran's formula to achieve a 95% confidence level with a 5% margin of error, assuming a conservative prevalence estimate of 50% for self-reported benefits. Inclusion criteria included consistent participation in strength training (≥ 2 sessions per week) and voluntary informed consent; exclusions comprised pregnancy, recent musculoskeletal injuries, or chronic conditions contraindicating exercise to mitigate potential biases.

A structured, self-structured questionnaire and semi-structured Likert scale was developed and pilot-tested on 30 women (Cronbach's $\alpha = 0.89$), incorporating validated scales such as the Rosenberg Self-Esteem Scale for psychological adaptations and custom items assessing physiological gains (e.g., lifting capacity, energy levels) and metabolic improvements (e.g., aerobic endurance). Data collection was done after gym, ensuring anonymity and a completion time of 15-20 minutes. Data were analyzed using descriptive statistics (frequencies, means, percentages) and inferential tests (χ^2 for associations between variables) via SPSS version 27.0, with significance set at $p < 0.05$. All participants provided Principal Investigator Undertaking, Participant Information Sheet and Written Informed Consent, with responses stored securely to uphold confidentiality and data integrity.

Inclusion Criteria

1. Adult women aged 18-50 years, representing active age group commonly engaged in resistance exercises.
2. Regular participation in strength training for a minimum of six months, defined as at least two sessions per week involving resistance-based activities (e.g., weightlifting, bodyweight exercises).
3. Voluntary provision of informed consent, confirming willingness to share self-reported experiences on physiological, metabolic, and psychological outcomes.

Exclusion Criteria

1. Current high- risk pregnancy or postpartum status within the last six months, due to potential physiological vulnerabilities.

2. History of recent (within the past three months) musculoskeletal injuries, surgeries, or acute conditions that could contraindicate strength training.
3. Presence of chronic medical conditions (e.g., uncontrolled hypertension, cardiovascular disease, or severe orthopedic disorders) that might limit exercise participation or influence self-reported benefits.
4. Engagement in professional athletic training or elite-level sports, to focus on recreational or semi-recreational female participants rather than specialized athletes.

The demographic variables were- age, religion, educational qualification, occupation, type of family, socio-economic status, session per week and adherence to strength training. The study variable was engagement in strength training of women. The outcome variable were self-reported physiological, metabolic, and psychological health benefits.

The tool used were structured, Self-Administered Questionnaire and Semi-Structured Likert Scale, which was validated by academic experts, researchers, senior gym trainers, aerobic instructors and physicians. The Pilot study was conducted to assess feasibility and clarity. The internal consistency of the self-structured Likert scale was established using Cronbach's alpha ($\alpha = 0.92$), indicating good reliability. Necessary modifications were made prior to final data collection.

Data were analyzed using descriptive statistics including frequency, percentage, mean, and standard deviation to describe demographic variables and perceived physiological and psychological benefits of strength training.

RESULT

A total of 384 women engaged in strength training participated in the study. Descriptive statistical analysis revealed substantial self-reported benefits across muscular, metabolic, physical, and psychological dimensions.

Muscle Strength

A high level of agreement was observed regarding improvements in muscular strength. The highest mean score was reported for increased lifting capacity (Mean = 4.6; 92%), followed by improved functional task performance (Mean = 4.4; 88%) and enhanced physical stamina (Mean = 4.3; 85%). These findings indicate strong perceived improvements in muscular efficiency and functional autonomy.

Body Changes

Participants reported noticeable physical changes associated with regular strength training. Better fitting clothes (Mean = 4.2; 83%) and visible muscle definition (Mean = 4.1; 80%) were widely endorsed. However, reduction in body fat (Mean = 3.8; 72%) demonstrated comparatively lower agreement, suggesting aesthetic transformation was secondary to performance-related benefits.

Metabolic Health

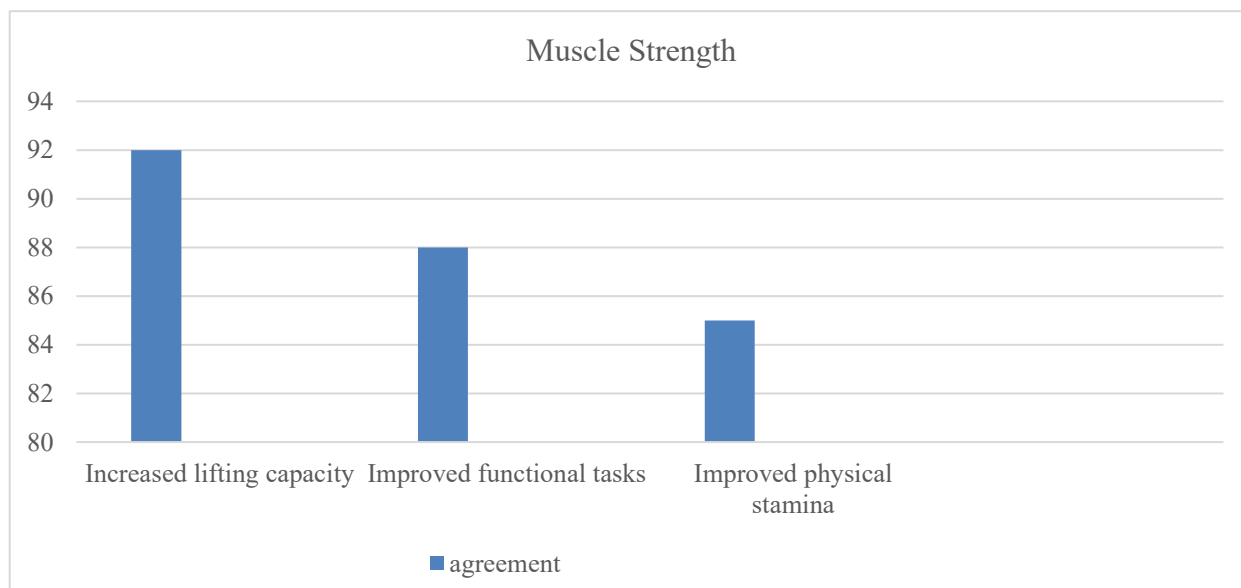
Strength training was strongly associated with improved metabolic vitality. Higher daily energy levels (Mean = 4.5; 90%) emerged as one of the most prominent outcomes. Additionally, faster physical recovery (Mean = 4.0; 78%) and improved appetite/digestion (Mean = 3.9; 75%) were positively perceived by the majority of participants.

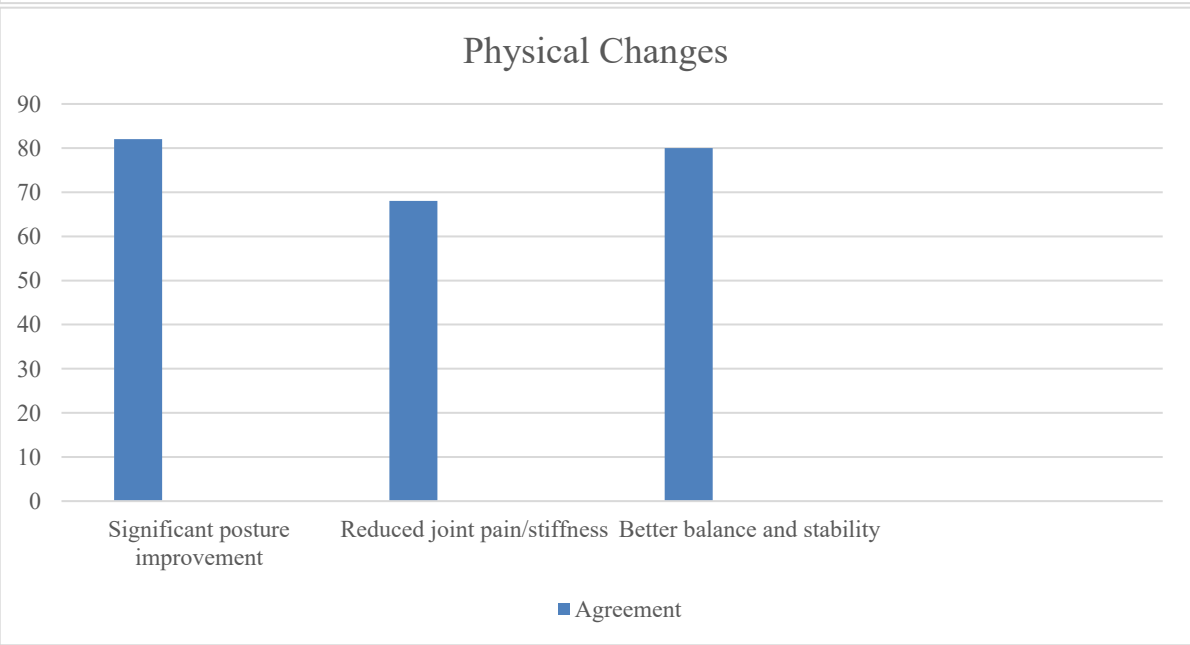
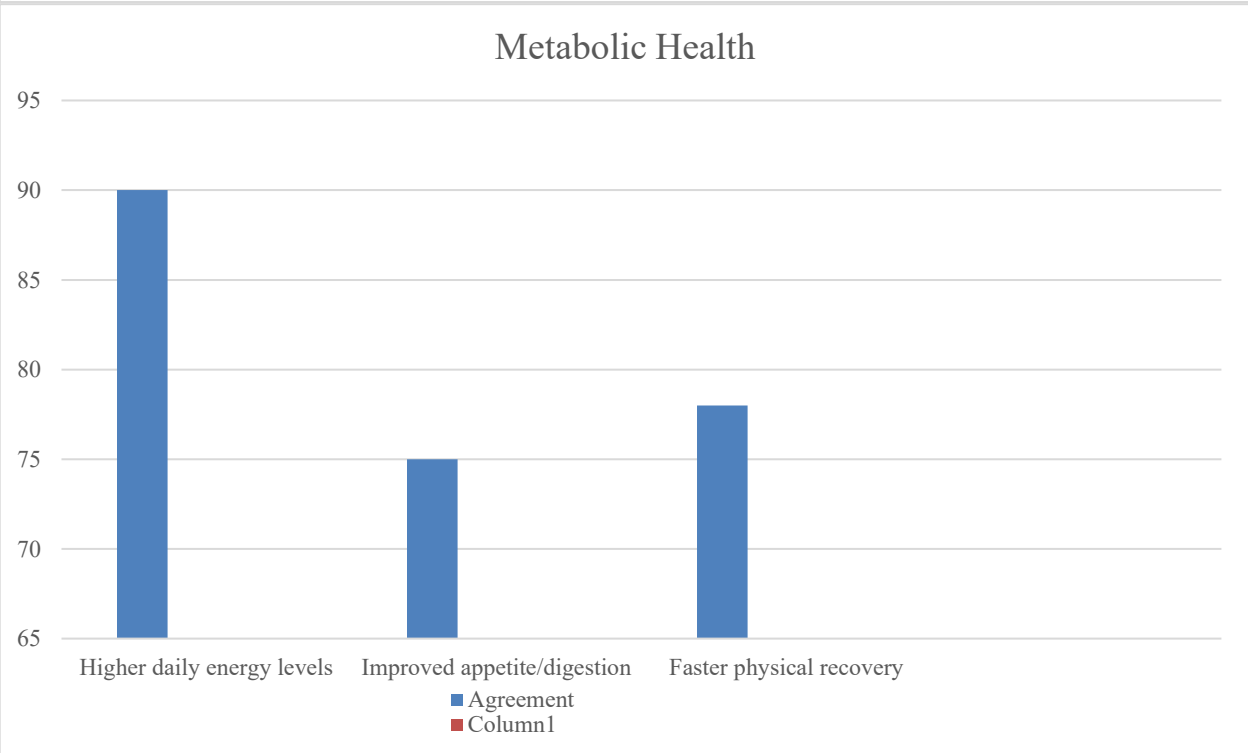
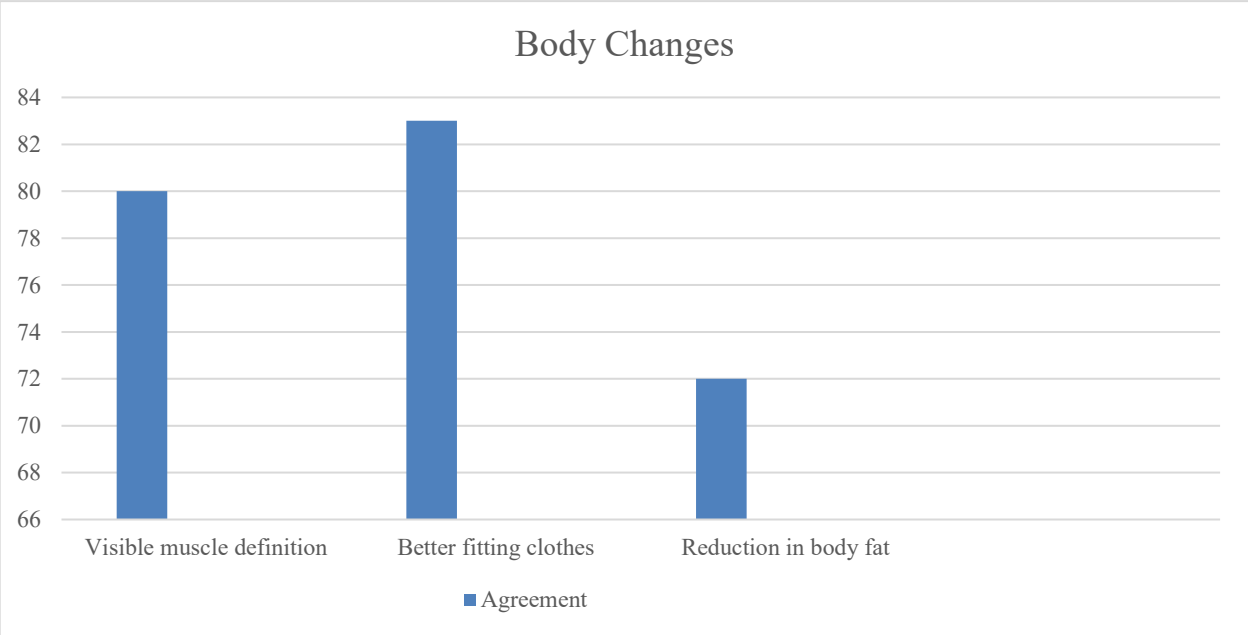
Physical Function

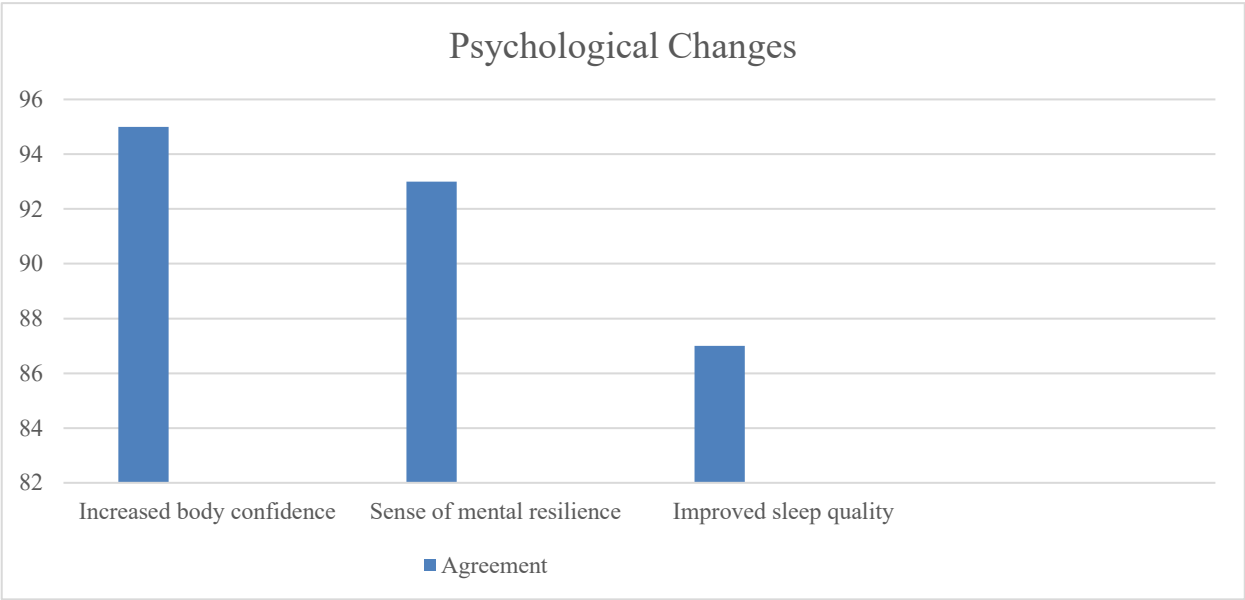
Functional musculoskeletal benefits were evident. Significant posture improvement (Mean = 4.2; 82%) and better balance and stability (Mean = 4.1; 80%) were strongly reported. In contrast, reduced joint pain/stiffness (Mean = 3.7; 68%) showed moderate agreement.

Psychological Outcomes

Psychological benefits demonstrated the highest overall agreement. Increased body confidence (Mean = 4.7; 95%) recorded the highest mean score among all variables. Similarly, enhanced mental resilience (Mean = 4.6; 93%) and improved sleep quality (Mean = 4.3; 87%) were strongly endorsed.



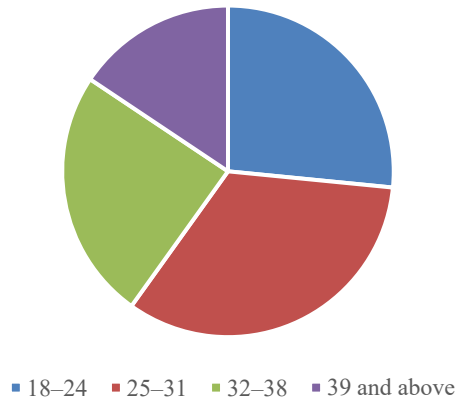




Dimension	Statement	Mean Score (1–5)	Agreement (%)
Muscle Strength	Increased lifting capacity	4.6	92%
	Improved functional tasks	4.4	88%
	Improved physical stamina	4.3	85%
Body Changes	Visible muscle definition	4.1	80%
	Better fitting clothes	4.2	83%
	Reduction in body fat	3.8	72%
Metabolic Health	Higher daily energy levels	4.5	90%
	Improved appetite/digestion	3.9	75%
	Faster physical recovery	4.0	78%
Physical Function	Significant posture improvement	4.2	82%
	Reduced joint pain/stiffness	3.7	68%
	Better balance and stability	4.1	80%
Psychological	Increased body confidence	4.7	95%
	Sense of mental resilience	4.6	93%
	Improved sleep quality	4.3	87%

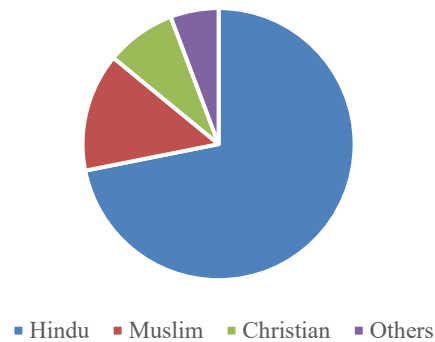
Demographic Variable		
Age Group (Years)	Frequency (n)	Percentage (%)
18–24	102	26.6%
25–31	128	33.3%
32–38	94	24.5%
39 and above	60	15.6%

Age



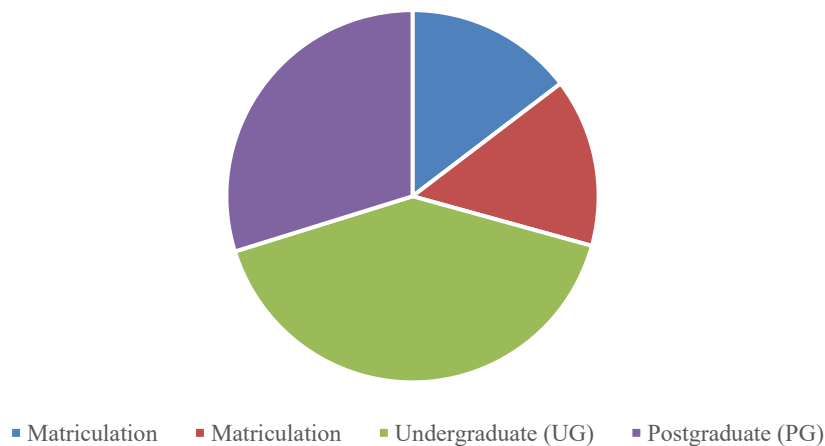
Religion	Frequency (n)	Percentage (%)
Hindu	276	71.9%
Muslim	54	14.1%
Christian	32	8.3%
Others	22	5.7%

Religion



Educational Qualification	Frequency (n)	Percentage (%)
Matriculation	58	15.1%
Undergraduate (UG)	162	42.2%
Postgraduate (PG)	118	30.7%
Above PG	46	12.0%

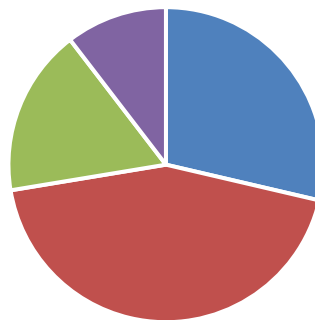
Educational Qualification



Occupation	Frequency (n)	Percentage (%)
Unemployed / Student	110	28.6%
Private Job	168	43.8%

Government Job	66	17.2%
Self-Employed	40	10.4%

Occupation



■ Unemployed / Student ■ Private Job ■ Government Job ■ Self-Employed

Sessions per Week	Frequency (n)	Percentage (%)
1–2 times per week	52	13.5%
2–3 times per week	118	30.7%
3–4 times per week	146	38.0%
5 or more times per week	68	17.8%

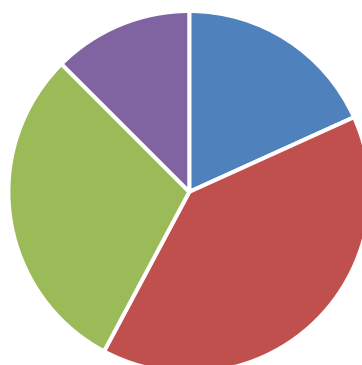
Sessions per week



■ 1–2 times per week ■ 2–3 times per week ■ 3–4 times per week ■ 5 or more times per week

Duration of Adherence	Frequency (n)	Percentage (%)
Less than 1 year	70	18.2%
1–2 years	152	39.6%
3–4 years	114	29.7%
More than 5 years	48	12.5%

Duration of Adherence



■ Less than 1 year ■ 1–2 years ■ 3–4 years ■ More than 5 years

DISCUSSION

The present descriptive study, involving 384 women engaged in strength training, revealed broadly positive self-reported outcomes across multiple health domains. Most participants were young to middle-aged adults (56.8% in nuclear families, high proportions with undergraduate and postgraduate education), indicating that women with higher education and private employment were more likely to adhere to structured strength training routines. This demographic profile resembles patterns observed in population studies showing that higher socioeconomic status and education are associated with greater engagement in muscle-strengthening activities among women. Recent surveillance data indicate age-related declines in strength training participation, with younger women generally more active than older cohorts, highlighting the importance of tailored strategies for different age groups.¹⁵

In line with existing evidence, the most prominent benefits reported in this study were in psychological and metabolic domains increased body confidence (95%), mental resilience (93%), and higher daily energy levels (90%). These findings correspond with large epidemiological studies showing that women derive significant mental and physical health gains from regular resistance training, including improved mood, self-esteem, and metabolic health.¹⁶ Specifically, current evidence supports that strength training confers unique benefits for women's cardiovascular and metabolic health, with structured programs linked to reductions in all-cause and cardiovascular mortality risk.¹⁷

The observed improvements in muscle strength and physical function (e.g., increased lifting capacity, posture, balance) align with recent systematic reviews demonstrating that resistance training enhances muscle strength, functional capacity, and balance, particularly among older women. Although outcomes related to body composition (such as fat reduction) were lower (72%), similar studies show that strength training significantly improves muscle mass and functional ability even in populations such as women with sarcopenia, reinforcing the role of resistance training in preserving muscle health across the lifespan.¹⁸

Moreover, the relatively high adherence to training frequency most training 2-4 times per week reflects current physical activity guidelines recommending regular muscle-strengthening activities for health benefits. Research indicates that women can obtain significant health benefits even with moderate training frequency, as strength training and even moderate physical activity led to reduced mortality and enhanced metabolic health when performed consistently.¹⁷

Regarding demographics, the predominance of women engaged in strength training contrasts with national surveillance data reporting lower overall participation rates among women compared with men. Recent research highlights that women are less likely to meet muscle-strengthening guidelines, often due to barriers like time constraints, cultural perceptions, and accessibility issues.¹⁸

Limitations of the study included that it was localized to the Delhi (NCR), India. The data relies entirely on self-reported perceptions via Likert scales rather than objective clinical measurements. As a cross-sectional survey, this study captures a snapshot in time. It cannot establish a definitive causal relationship between strength training and the reported benefits, nor can it track the fluctuating nature of barriers and adherence over a longer trajectory. By excluding professional athletes, the study lacks insight into how strength training affects women at elite performance levels.

Future Recommendations

Future studies should transition from a cross-sectional to a longitudinal design, following a cohort of women over 12-24 months to observe how barriers like "occupational fatigue" fluctuate and how adherence evolves through different life stages. To complement self-reported data, researchers should incorporate biometric assessments, such as Dual-Energy X-ray Absorptiometry (DEXA) for body composition, 1-Repetition Maximum (1RM) for strength, and blood glucose/lipid profiles to quantify metabolic improvements. Expanding the research to include rural and semi-urban populations across India would provide a more representative understanding of the cultural and accessibility barriers that differ from the urban Delhi NCR demographic. Future research could compare the efficacy of home-based vs. gym-based strength training to determine if reducing "gym access" barriers significantly improves long-term adherence in busy professional women. Incorporating In-depth Interviews (IDIs) or Focus Group Discussions (FGDs) would allow for a deeper exploration of the "Sense of Mental Resilience", uncovering the specific psychological mechanisms that drive empowerment in women.

CONCLUSION

This study concludes that strength training serves as a multi-dimensional health intervention for women, where the psychological impact of 95% increased body confidence and 90% improved metabolic energy significantly outweigh traditional aesthetic motivations. However, an adherence paradox exists; while participants report profound gains in functional autonomy and mental resilience, systemic obstacles such as occupational fatigue and work-family time constraints hinder long-term consistency for nearly half of the cohort. Ultimately, the findings suggest that while women increasingly embrace strength training for its holistic vitality, the transition from short-term participation to lifelong physical autonomy requires a strategic societal shift toward flexible training environments and integrated workplace wellness initiatives.

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