

DIGITALIZATION AND SOCIAL TRANSFORMATION IN WEIGHTLIFTING: URBAN–RURAL DIFFERENCES IN DIGITAL ENGAGEMENT AND SOCIAL INCLUSIVITY IN PUNJAB, INDIA

Deepak Singh¹, Dr Ravi Kumar^{1*}, Dr Chanderkant Dhiman², Dr Rajwinder Kaur¹

¹Department of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India.

^{1*}Department of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India. Email: ravikumar.gahalawat@gmail.com, ORCID: <https://orcid.org/0009-0003-7272-9132>, Scopus ID: 60690012100

²Royal School of Physical Education & Sports, Royal Global University, Guwahati, Assam, India.

*Corresponding Author: Email: ravikumar.gahalawat@gmail.com

ABSTRACT

Objective: This study investigated urban–rural differences in Digital Media engagement and Social Inclusivity among young adults involved in weightlifting or structured strength training in the Malwa region of Punjab, India. It also examined the independent contributions of urban residence, gender, age, and training experience to these outcomes.

Methods: A cross-sectional quantitative analysis was conducted using data from 200 participants aged 18–25 years recruited from Bathinda, Patiala, Sangrur, Moga, and Ludhiana. The sample included 100 urban and 100 rural participants and equal numbers of males and females. All participants had at least six months of continuous experience in weightlifting or structured strength training. Digital Media and Social Inclusivity were measured using continuous five-point Likert-type scales. Independent-samples t tests, Pearson correlations, one-way ANOVA, and multiple linear regression were employed.

Results: Digital Media engagement was substantially higher among urban participants ($M = 4.50$, $SD = 0.50$) than rural participants ($M = 2.40$, $SD = 0.49$), with a mean difference of 2.10, 95% CI [1.96, 2.24], $t(197.92) = 29.85$, $p < .001$, Cohen's $d = 4.22$. Urban residence was the strongest predictor of Digital Media engagement ($B = 2.13$, $p < .001$), while age was positively associated ($B = 0.29$, $p < .001$) and training experience negatively associated ($B = -0.05$, $p = .001$). The model explained 83.2% of variance. Social Inclusivity was also significantly higher in urban settings ($M = 4.37$, $SD = 0.63$) than rural settings ($M = 2.50$, $SD = 0.50$), $t(198) = 23.20$, $p < .001$, $d = 3.28$. Urban residence predicted Social Inclusivity ($B = 1.88$, $p < .001$), with the model explaining 78.0% of variance. Gender did not significantly predict either outcome.

Conclusion: Urbanization is strongly associated with digital and sociocultural dimensions of contemporary weightlifting. The findings suggest that unequal access to digital fitness resources and differences in the social organization of training may reinforce the broader urban–rural divide. Digital inclusion strategies should therefore be incorporated into rural weightlifting development alongside physical infrastructure.

KEYWORDS: digitalization; social media; weightlifting; social inclusivity; urbanization; rural–urban divide; fitness culture; Punjab

1. INTRODUCTION

Digital technologies have become increasingly embedded in contemporary sport and fitness. Athletes and recreational exercisers can access instructional videos, training programs, nutritional information, coaching resources, athlete communities, and performance-oriented content through social networking platforms and specialized applications. This transformation has altered not only the availability of exercise information but also the social organization of participation. Social media can serve multiple functions within physical-activity contexts. It can disseminate information, facilitate interpersonal interaction, support group formation, and create communities around exercise-related interests. A systematic review by Goodyear et al. (2021) reported evidence that social media interventions can positively influence physical-activity and dietary behaviours through mechanisms including information exchange and social interaction. Günther et al. (2021) similarly concluded that social-media-based approaches have potential for promoting physical activity, although the evidence is heterogeneous.

Digital engagement, however, should not be treated as synonymous with effective training. Greater exposure to digital content does not necessarily ensure that the information is accurate, evidence-based, or translated into meaningful behavioural change. Shiyab et al. (2023), in a systematic review of social-media interventions, reported mixed findings concerning physical activity and weight-related outcomes. The distinction between access to information and the quality or application of that information is therefore essential.

These issues become especially relevant when considered through an urban–rural framework. Urbanization is accompanied by differences in connectivity, digital infrastructure, access to commercial fitness services, exposure to global fitness cultures, and availability of organized sporting communities. The thesis underlying the present article proposes that digital media represents one of the mechanisms through which urbanization integrates local weightlifting practices with wider global fitness culture. It identifies platforms such as YouTube, Instagram, fitness applications, online coaching, and virtual communities as increasingly important sources of exercise and nutrition information.

The social meaning of weightlifting is also changing. In Punjab, strength culture has historically been connected with agricultural labour, wrestling, akhadas, masculinity, practical strength, and community identity. Contemporary urban fitness environments increasingly associate resistance training with health, aesthetics, athletic development, self-improvement, lifestyle, and social interaction. The thesis accordingly conceptualizes fitness spaces as social environments in which individuals can develop relationships, identities, and forms of social participation.

A useful theoretical interpretation is provided by Bourdieu's conception of capital. Cultural, social, and symbolic resources influence how individuals participate in social fields and how identities and forms of status are produced. Applied to weightlifting, access to information, coaching, digital networks, facilities, and socially valued fitness practices may constitute resources that influence an individual's participation and sense of belonging.

Social inclusivity is particularly important in this context. Participation in organized sport is shaped by multiple social and environmental influences. Crossman et al. (2024) identified interacting facilitators and constraints involving health, enjoyment, interpersonal relationships, family, finances, and contextual conditions. Thus, social inclusion cannot be reduced to the absence of discrimination; it also involves opportunities for interaction, support, belonging, and participation.

Gender provides an additional dimension. Existing research has identified significant sociocultural and structural barriers to women's participation in Indian sport, including economic constraints, limited infrastructure, sporting culture, career uncertainty, and knowledge gaps (Das et al., 2025). Research concerning South Asian women similarly identifies gender roles as important barriers to physical activity while highlighting social support as a facilitator (Rehman et al., 2024). The present study offers an important counterpoint by examining individuals who have already entered and remained in weightlifting environments for at least six months.

The central empirical gap is therefore twofold. First, limited research has examined whether urbanization is associated with differential digital engagement among weightlifters. Second, there is insufficient evidence concerning whether urban and rural weightlifters experience their training environments differently in terms of social inclusivity. The present article addresses these gaps by focusing specifically on Digital Media and Social Inclusivity.

2. METHODOLOGY

2.1 Research design and setting

The present article uses the quantitative component of an explanatory cross-sectional mixed-methods study conducted in five districts of the Malwa region of Punjab. Urbanization was operationalized through residential context, classified as urban or rural. The study examined how this spatial distinction was associated with Digital Media and Social Inclusivity among established participants in weightlifting or structured strength training.

2.2 Participants

A total of 200 participants aged 18–25 years were recruited using stratified sampling. The sample included 100 urban and 100 rural participants, with 100 males and 100 females. Each of the five districts contributed 40 participants. Participants were required to have at least six months of continuous experience in weightlifting or structured strength training.

The balanced design was intended to reduce demographic imbalance between geographic groups. The mean age of the full sample was 21.60 years and mean training experience was 23.64 months. Urban and rural groups exhibited closely similar demographic characteristics.

2.3 Measures

The study employed structured questionnaires containing continuous five-point Likert-scale measures of Facility Access, Training Method, Digital Media, and Social Inclusivity. For this article, Digital Media and Social Inclusivity were the primary outcomes.

Digital Media referred to participants' engagement with online platforms and digital resources relevant to exercise, nutrition, training information, and fitness communities.

Social Inclusivity referred to perceptions of the extent to which the weightlifting or fitness environment was socially open, supportive, organized, and accessible to diverse participants.

The broader methodological framework also incorporated observation, interviews, and focus groups; however, the present article is restricted to the quantitative results reported in the thesis.

2.4 Statistical procedures

IBM SPSS Statistics version 26.0 was used for analysis. Descriptive statistics characterized the sample and study variables. Independent-samples *t* tests compared urban and rural participants. Pearson correlations were used to examine associations among the principal dimensions of the weightlifting environment. Multiple linear regression examined the independent contributions of urban residence, gender, age, and training experience. One-way ANOVA assessed district-level differences. The significance level was set at $p < .05$.

3. Analysis of Data and Results

3.1 Digital Media engagement

The strongest urban–rural contrast in the study occurred for Digital Media. Rural participants reported a mean score of 2.40 ($SD = 0.49$), whereas urban participants reported a mean score of 4.50 ($SD = 0.50$). The mean difference was 2.10 points, with a 95% confidence interval of [1.96, 2.24]. The difference was statistically significant ($t(197.92) = 29.85$, $p < .001$), and the associated Cohen's *d* was 4.22, indicating an exceptionally large effect.

Table 1: Urban–rural comparison of Digital Media engagement

Group	M	SD	Mean difference	t	df	p	Cohen's d
Rural	2.40	0.49					

Urban	4.50	0.50	2.10	29.85	197.92	< .001	4.22
-------	------	------	------	-------	--------	--------	------

3.2 Social Inclusivity

Urban participants also reported substantially greater Social Inclusivity. The urban mean was 4.37 (SD = 0.63), compared with 2.50 (SD = 0.50) among rural participants. The mean difference was 1.87 points, with a 95% confidence interval of [1.71, 2.03]. The independent-samples test was statistically significant, $t(198) = 23.20$, $p < .001$, and Cohen's $d = 3.28$.

Table 2: Urban–rural comparison of Social Inclusivity

Group	M	SD	Mean difference	t	df	p	Cohen's d
Rural	2.50	0.50					
Urban	4.37	0.63	1.87	23.20	198	< .001	3.28

3.3 Correlation analysis

Facility Access was strongly and positively associated with Digital Media engagement ($r = .82$) and Social Inclusivity ($r = .86$). The association between Facility Access and Training Method was also strong ($r = .78$), although the present article concentrates on the digital and social dimensions. These associations indicate that the dimensions of contemporary weightlifting culture are interconnected rather than isolated.

Table 3: Selected correlations among weightlifting–environment dimensions

Variables	r
Facility Access – Digital Media	.82
Facility Access – Social Inclusivity	.86
Facility Access – Training Method	.78

3.4 Regression analysis for Digital Media

The Digital Media regression model was statistically significant, $F(4, 195) = 241.90$, $R^2 = .832$. Urban residence emerged as the strongest predictor, with $B = 2.13$, 95% CI [1.99, 2.27], $t = 31.07$, $p < .001$. Age was also significant ($B = 0.29$, 95% CI [0.13, 0.45], $t = 3.76$, $p < .001$), while training experience was negatively associated with Digital Media engagement ($B = -0.05$, 95% CI [-0.09, -0.01], $t = -3.38$, $p = .001$). Gender was not significant ($B = 0.03$, $p = .708$). The model therefore explained 83.2% of the variance in Digital Media engagement.

3.5 Regression analysis for Social Inclusivity

The Social Inclusivity model was statistically significant, $F(4, 195) = 173.22$, $R^2 = .780$. Urban residence was a strong positive predictor, with $B = 1.88$, 95% CI [1.74, 2.02], $t = 25.41$, $p < .001$. Gender ($B = 0.01$, $p = .924$), age ($B = 0.07$, $p = .412$), and training experience ($B = 0.01$, $p = .617$) were not significant predictors.

Table 4: Regression models predicting Digital Media and Social Inclusivity

Outcome	Predictor	B	95% CI	t	p	R ²
Digital Media	Urban	2.13	[1.99, 2.27]	31.07	<.001	.832
	Male	0.03	[-0.11, 0.17]	0.38	.708	
	Age	0.29	[0.13, 0.45]	3.76	<.001	
	Experience	-0.05	[-0.09, -0.01]	-3.38	.001	
Social Inclusivity	Urban	1.88	[1.74, 2.02]	25.41	<.001	.780
	Male	0.01	[-0.13, 0.15]	0.10	.924	
	Age	0.07	[-0.09, 0.23]	0.82	.412	
	Experience	0.01	[-0.03, 0.05]	0.50	.617	

3.6 District-level analysis

The five districts did not significantly differ in Digital Media or Social Inclusivity. Digital Media yielded $F(4, 195) = 0.000$, $p = 1.000$, while Social Inclusivity yielded $F(4, 195) = 0.006$, $p = 1.000$. Partial eta-squared values were below .001.

This finding suggests that the urban–rural distinction represents the principal structural division within the dataset rather than differences among individual districts.

4. DISCUSSION

The most prominent result was the exceptionally large difference in Digital Media engagement between urban and rural participants. Urban respondents reported an average score more than two points higher than their rural counterparts, and

the effect size exceeded 4.00. This finding provides empirical evidence of a digital dimension to the urbanization of weightlifting.

Digitalization can influence weightlifting in several ways. It expands access to demonstrations of technical movements, training plans, nutritional information, recovery strategies, athlete experiences, and international weightlifting trends. Goodyear et al. (2021) showed that digital interventions can facilitate physical-activity and dietary behaviours through information dissemination, interaction, and community formation. Günther et al. (2021) likewise identified social-media platforms as potentially useful mechanisms for promoting physical activity.

The present results should nevertheless not be interpreted as evidence that greater social-media use automatically leads to better athletic outcomes. The study measured engagement with digital resources rather than objective improvements in performance. Shiyab et al. (2023) reported mixed results regarding the effectiveness of social-media interventions, highlighting the importance of distinguishing digital exposure from successful behavioural or health outcomes.

The positive association between urban residence and Digital Media remained after adjustment for age, gender, and training experience. This finding suggests that the disparity is not simply a function of the characteristics of the athletes who live in urban locations. Instead, differences in connectivity, access to facilities, digital ecosystems, and exposure to technology-enabled fitness communities may contribute to the observed relationship.

Age was also positively associated with Digital Media engagement even within the relatively narrow 18–25-year age range. This indicates that modest differences in age may correspond to differences in digital engagement. Training experience, by contrast, was negatively associated with Digital Media. One plausible interpretation is that newer or less experienced lifters may rely more heavily on online demonstrations and programming, while more experienced participants may increasingly rely on accumulated practical knowledge and direct coaching. This interpretation remains explanatory rather than causal because the study was cross-sectional.

The Social Inclusivity results provide a complementary dimension to the digital findings. Urban participants recorded substantially higher perceptions of inclusivity, with an effect size of 3.28. The regression analysis confirmed that urban residence was the only significant predictor among the variables included in the model.

Bourdieu's theory of capital provides a useful framework for interpreting this result. Contemporary fitness environments may function as social fields in which participants accumulate and exchange forms of social, cultural, and symbolic capital. Access to organized facilities, knowledgeable coaches, technologically mediated information, peer networks, and recognized fitness practices may increase opportunities for social interaction and participation.

Crossman et al. (2024) emphasized that sports participation is shaped by interacting social, interpersonal, financial, and contextual conditions. The present study extends this perspective to weightlifting in Punjab by demonstrating that the social experience of the training environment differs markedly according to residential context.

The findings also have implications for understanding the changing cultural meaning of strength in Punjab. Traditional akhadas, wrestling, manual labour, and practical strength historically provided important social spaces for physical development. Contemporary urban fitness environments introduce new forms of interaction centered on health, aesthetics, athletic performance, lifestyle, and self-development. The difference in Social Inclusivity may therefore reflect not merely interpersonal friendliness but a broader institutional transformation of the social organization of weightlifting.

The gender results require careful interpretation. There were no significant male–female differences in any of the four primary domains, and gender did not significantly predict Digital Media or Social Inclusivity. This may suggest relative gender parity among individuals who have already entered established weightlifting environments. However, it should not be interpreted as evidence that wider gender barriers in Indian sport have disappeared.

Das et al. (2025) identified economic, infrastructural, cultural, career-related, and knowledge-related barriers to women's participation in sports in India. Rehman et al. (2024) similarly identified gender roles as important sociocultural barriers to physical activity among South Asian women while emphasizing the enabling role of social support. Because the present study included only established participants with at least 6 months of training experience, the sample may exclude women and other individuals who were prevented from entering such environments in the first place.

The strong correlation between Facility Access and Social Inclusivity ($r = .86$) is also theoretically relevant. Contemporary fitness facilities may simultaneously provide equipment, professional coaching, peer interaction, digital information, and organized communities. A physical facility can therefore serve as a platform that connects material, informational, and social resources. Nevertheless, the correlation should not be interpreted as proof that Facility Access causes Social Inclusivity. Both may be influenced by broader urban socioeconomic and institutional conditions.

The absence of district-level differences further reinforces the structural interpretation. Bathinda, Ludhiana, Moga, Patiala, and Sangrur did not differ significantly on Digital Media or Social Inclusivity. The meaningful divide therefore appears to be between urban and rural environments across the region rather than among districts themselves.

From a policy standpoint, the findings suggest that rural weightlifting development should not focus exclusively on constructing physical facilities. Digital inclusion should form a parallel component of sports development. Rural athletes could benefit from reliable digital access, curated evidence-based training resources, remote coaching, online educational modules, and structured digital communities. However, digital interventions should be accompanied by quality-control mechanisms because increased exposure to online fitness information does not guarantee scientifically appropriate practice.

As with the first article, causal conclusions are inappropriate. Cross-sectional associations cannot establish that urbanization caused higher digital engagement or greater social inclusivity. The models also do not contain all possible determinants, including household socioeconomic characteristics, internet quality, parental support, coach characteristics, or previous competitive exposure.

5. CONCLUSION

The study demonstrates that urbanization is associated with pronounced differences in the digital and social dimensions of contemporary weightlifting in the Malwa region of Punjab. Urban participants reported much greater Digital Media engagement and substantially higher Social Inclusivity than rural participants. Urban residence was the strongest predictor of both outcomes, while gender was not a significant predictor in either model.

The findings suggest that the modernization of weightlifting is occurring through interconnected physical, technological, and social processes. Urbanization appears to provide not only greater exposure to digital fitness information but also more socially organized training environments.

Reducing urban–rural disparities in weightlifting therefore requires a multidimensional strategy. Rural sports development should combine specialized infrastructure with qualified coaching, digital education, evidence-based online resources, and socially inclusive training communities. Such interventions could help extend the benefits of contemporary weightlifting culture to athletes who remain geographically distant from major urban fitness ecosystems.

REFERENCES

1. Crossman, S., Drummond, M., Elliott, S., Kay, J., Montero, A., & Petersen, J. M. (2024). Facilitators and constraints to adult sports participation: A systematic review. *Psychology of Sport and Exercise*, 72, 102609. <https://doi.org/10.1016/j.psychsport.2024.102609>
2. Das, D., Kumar, P., Dixit, A., & Balyan, V. (2025). The missing gender: Examining the barriers to women's participation in sports in India. *Business Perspectives and Research*, 13(4). <https://doi.org/10.1177/22785337221148557>
3. Goodyear, V. A., Wood, G., Skinner, B., & Thompson, J. L. (2021). The effect of social media interventions on physical activity and dietary behaviours in young people and adults: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 18, 72. <https://doi.org/10.1186/s12966-021-01138-3>
4. Günther, L., Schleberger, S., & Pischke, C. R. (2021). Effectiveness of social media-based interventions for the promotion of physical activity: Scoping review. *International Journal of Environmental Research and Public Health*, 18(24), 13018. <https://doi.org/10.3390/ijerph182413018>
5. Rehman, A., Pedamallu, H., Gou, J., Kandula, N., & Vu, M. (2024). Gender-related sociocultural factors impacting physical activity among female South Asians: A scoping review. *Health Behavior and Policy Review*, 11(6), 1784–1797. <https://doi.org/10.14485/hbpr.11.6.4>
6. Shiyab, A., Al-Qudimat, A., Al-Hajri, R., et al. (2023). The impact of social media interventions on weight reduction and physical activity improvement among healthy adults: Systematic review. *Journal of Medical Internet Research*.
7. Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). Greenwood.
- 8.