

Digital Age Sedentarism: Postural Health and Psychosomatic Outcomes from a Physiotherapy Lens

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Abstract: The rapid digitalization of modern society has led to increased sedentary behavior, significantly impacting physical and mental health. This study investigates the relationship between sedentary lifestyle, postural deviations, and psychosomatic wellbeing from a physiotherapy perspective. A cross-sectional analytical study was conducted among 200 individuals aged 18–45 years with prolonged screen exposure. Standardized tools including the Nordic Musculoskeletal Questionnaire (NMQ), Postural Assessment Scale, and Depression Anxiety Stress Scale (DASS-21) were used. Statistical analysis revealed significant correlations between sedentary duration, postural abnormalities, and psychosomatic symptoms ($p < 0.05$). The findings emphasize the need for physiotherapy-led interventions focusing on ergonomics, posture correction, and holistic rehabilitation.

Keyword: digital age, screen time, posture, stress

INTRODUCTION

The 21st century has witnessed a dramatic transformation in lifestyle patterns due to technological advancements. Increased reliance on digital devices for work, education, and leisure has resulted in prolonged sedentary behavior. Sedentarism (sedentary) is lifestyle characterized by minimal physical movement and low energy expenditure (1.5metabolic equivalent task or less) often involving prolonged sitting , lying down or screen time.

From a biomechanical perspective, sustained static postures—particularly forward head posture, thoracic kyphosis, and lumbar flexion—lead to altered muscle activation patterns, reduced joint mobility, and increased mechanical stress. These deviations disrupt normal kinematics and contribute to musculoskeletal disorders (MSDs).

Simultaneously, psychosomatic health has emerged as a critical concern. Psychosomatic disorders involve physical symptoms influenced or exacerbated by psychological factors such as stress, anxiety, and depression. The biopsychosocial model provides a framework for

understanding this interaction, emphasizing that physical health cannot be separated from mental wellbeing.

Recent literature suggests that sedentary behavior is independently associated with poor mental health outcomes. Reduced physical activity leads to decreased endorphin release, impaired autonomic regulation, and increased cortisol levels, contributing to psychological distress.

Physiotherapy, as a holistic healthcare discipline, addresses both physical impairments and functional limitations while incorporating psychosocial aspects. This study aims to bridge the gap between posture, sedentary behavior, and psychosomatic health.

NEED FOR THE STUDY

- Rapid increase in screen-based occupations
- High prevalence of posture-related musculoskeletal disorders
- Growing burden of stress, anxiety, and depression
- Lack of integrative physiotherapy research addressing psychosomatic health
- Need for preventive healthcare strategies in young adults

OBJECTIVES

1. To assess postural deviations in individuals with prolonged sedentary behavior
2. To evaluate psychosomatic symptoms using standardized scales
3. To determine the correlation between posture and psychosomatic health
4. To propose physiotherapy-based intervention strategies

METHODOLOGY

Study Design- Cross-sectional analytical study.

Study Setting -Urban population with high digital exposure.

Sample Size and Sampling Technique

- Sample Size: 200 participants
- Sampling Method: Convenience sampling

Inclusion Criteria

- Age 18–45 years
- Screen time $\geq$ 6 hours/day
- Sedentary occupation or student population

Exclusion Criteria

- Neurological disorders
- Recent fractures or surgeries
- Diagnosed psychiatric illness

Outcome Measures

Tool	Description	Reliability
Nordic Musculoskeletal Questionnaire	Assesses regional pain	High
Postural Assessment Scale	Evaluates alignment	Moderate–High
DASS-21	Measures depression, anxiety, stress	High

Procedure

1. Ethical approval obtained
2. Informed consent from participants
3. Recording demographic data
4. Assessment of screen time and lifestyle habits
5. Postural evaluation using observation and scale

6. Psychosomatic assessment using DASS-21
7. Data entry and statistical analysis

Statistical Analysis

- Software: SPSS Version 25
- Descriptive statistics: Mean, SD, percentage
- Inferential statistics: Pearson correlation test
- Significance level: $p < 0.05$

RESULTS

Table 1: Postural Deviations

Deviation	Percentage
Forward Head Posture	68%
Rounded Shoulders	62%
Lumbar Slouching	70%

Table 2: Psychosomatic Symptoms

Symptom	Prevalence
Stress	65%
Anxiety	58%
Depression	45%

Table 3: Correlation Analysis

Variable 1	Variable 2	r-value	p-value
Screen Time	Posture Score	0.62	<0.05
Posture Score	Stress	0.58	<0.05
Posture Score	Anxiety	0.54	<0.05

Key Findings

- Strong positive correlation between sedentary duration and postural deviation
- Significant association between poor posture and psychosomatic symptoms
- Individuals with higher screen exposure showed increased stress levels

DISCUSSION

The present study provides compelling evidence linking sedentary behavior in the digital age with postural dysfunction and psychosomatic health disturbances. The findings reveal that individuals with prolonged screen exposure demonstrate a higher prevalence of forward head posture, rounded shoulders, and lumbar slouching, which are consistent with adaptive musculoskeletal changes due to sustained static loading.

From a biomechanical standpoint, prolonged sitting leads to altered length-tension relationships in muscles. Tightness in the pectoralis major, upper trapezius, and hip flexors, combined with deep cervical flexors, lower trapezius, and core musculature, results in postural imbalance. These alterations compromise spinal alignment and increase compressive and shear forces on intervertebral structures, predisposing individuals to chronic pain syndromes.

The correlation analysis in this study ($r = 0.62$ between screen time and postural deviation) suggests a strong association, reinforcing the hypothesis that digital sedentarism is a major contributing factor to postural deterioration. Furthermore, the relationship between posture and stress ($r = 0.58$) indicates that physical dysfunction may directly or indirectly influence psychological health.

From a neurophysiological perspective, physical inactivity is associated with reduced release of endorphins and serotonin, which are essential for mood regulation. Additionally, prolonged sedentary behavior may dysregulate the hypothalamic-pituitary-adrenal (HPA) axis, leading to elevated cortisol levels and increased stress response. This supports the observed prevalence of anxiety (58%) and stress (65%) among participants.

The concept of psychosomatic interaction is further explained by the biopsychosocial model, where physical discomfort (e.g., neck pain, back pain) acts as a stressor, contributing to emotional distress. Conversely, psychological stress can increase muscle tension, particularly in the cervical and shoulder regions, thereby worsening postural abnormalities. This bidirectional relationship creates a self-perpetuating cycle of pain and psychological strain.

Comparison with previous literature shows consistency with studies by Smith et al. (2018), who reported significant associations between sedentary time and depressive symptoms. Similarly, Biddle & Asare (2011) highlighted that reduced physical activity is linked to poorer mental health outcomes. The present study extends these findings by integrating postural assessment, providing a more comprehensive physiotherapy perspective.

Clinically, these findings emphasize the importance of early screening for postural deviations in individuals with high screen time. Physiotherapists should adopt a multidimensional approach that includes musculoskeletal assessment, ergonomic evaluation, and psychosomatic screening.

Another important implication is the role of ergonomics in prevention. Improper workstation setup, including low screen height and unsupported seating, significantly contributes to poor posture. Education regarding workplace ergonomics can play a crucial role in reducing risk factors.

Despite the significant findings, the study has certain limitations. The cross-sectional design limits causal inference, and reliance on self-reported data may introduce bias. Future research should focus on longitudinal and interventional studies to establish causality and evaluate the effectiveness of physiotherapy interventions.

Overall, the discussion highlights that digital age sedentarism is not merely a lifestyle issue but a multifactorial health concern requiring integrated physiotherapy management addressing both physical and psychological domains.

Mechanism

Sedentary Lifestyle → Muscle Imbalance → Postural Deviation → Pain & Discomfort →
Psychological Stress → Psychosomatic Disorders

Physiotherapy Intervention Protocol

1. Postural Correction Exercises

- Chin tucks
- Scapular retraction exercises
- Pelvic tilting

2. Strengthening Exercises

- Core stabilization
- Back extensor strengthening

3. Flexibility Training

- Chest stretching
- Hamstring stretching

4. Ergonomic Advice

- Proper chair and desk height
- Screen positioning at eye level

5. Psychosomatic Management

- Breathing exercises
- Relaxation techniques (progressive muscle relaxation)
- Mindfulness training

CONCLUSION

Digital age sedentarism significantly impacts both postural health and psychosomatic wellbeing. The study confirms that prolonged sedentary behavior leads to postural dysfunction, which is strongly associated with psychological distress. Physiotherapy plays a crucial role in prevention and rehabilitation through a holistic, patient-centered approach. Early intervention strategies are essential to reduce long-term health risks.

Screen Time vs Postural Deviation

Low Screen Time → Mild Deviation Moderate Screen Time → Moderate Deviation High Screen Time → Severe Deviation

Posture vs Stress Level

Good Posture → Low Stress Moderate Deviation → Moderate Stress Severe Deviation → High Stress

References

1. World Health Organization. (2020). Guidelines on physical activity and sedentary behaviour.
2. Biddle, S. J. H., & Asare, M. (2011). Physical activity and mental health in children and adolescents.
3. Kendall, F. P. (2005). Muscles: Testing and Function.
4. Smith, L., et al. (2018). Sedentary behavior and mental health: A systematic review.
5. American Physical Therapy Association. (2021). Clinical practice guidelines.
6. Hallal, P. C., et al. (2012). Global physical activity levels.