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ASSOCIATION BETWEEN SLEEP QUALITY AND WORK PRODUCTIVITY AMONG THE DIABETIC POPULATION.

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BACKGROUND: Diabetic Mellitus (DM T2) is an epidemic health condition in the Pakistan that has enormous impacts on health, consequent effects on Health-Related Quality of Life (HRQOL) and has effects on work productivity. **OBJECTIVE:** To determine the association between sleep quality and work productivity among diabetes. **METHODOLOGY:** This cross-sectional study was conducted in various hospitals in Lahore from April 2023 to July 2023, utilizing a nonprobability convenience sampling technique to recruit 123 participants diagnosed with diabetes. Inclusion criteria comprised individuals of both genders, aged between 35 and 65 years, with a minimum diabetes duration of 2 years. Exclusion criteria encompassed the presence of chronic kidney disease, liver disease, severe heart disease, active thyroid disorder, a history of trauma, and women in their 2nd and 3rd trimesters. Data collection, involving the administration of informed consent, employed the Work Productivity and Activity Impairment Questionnaire, Pittsburgh Sleep Quality Index, and EuroQol-5 Dimensions survey. Statistical analysis was performed using SPSS-23, providing a comprehensive approach to investigate the relationships and outcomes associated with diabetes in the specified population. **RESULTS:** The mean and standard deviation for various scales, including PSQI, EQ-5D, and different aspects of work and activity impairments. Notably, PSQI exhibited a mean of 9.46 with a standard deviation of 2.39. Table 8 illustrates correlations, with PSQI showing a significant correlation ($p < 0.05$) with EQ-5D and work-related impairments. Additionally, age demonstrated correlations with several scales, emphasizing its relevance in the study. These findings provide valuable insights into the relationships among sleep quality, health status, and work-related outcomes. **CONCLUSION:** This study reveals a significant positive correlation between sleep quality and health-related quality of life in type 2 diabetic patients.

KEYWORDS: Diabetic type II, Quality of life, Sleep Quality, Work Productivity

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INTRODUCTION

Over the past 40 years, type 2 diabetes (T2D) has been on the rise worldwide, with the biggest increases occurring in nations experiencing fast changing epidemiologies, especially in Asia¹. Millions of people worldwide suffer from diabetes, a chronic metabolic disease marked by elevated blood sugar levels. The disorder is linked to a number of problems that go beyond

issues with physical health². Preventing complications from diabetes while preserving quality of life (QoL) is the overarching aim of diabetes care. According to reports, persons with diabetes have a lower quality of life than those without the disease³. Aspects of QoL that could impact one's physical or mental health are included in health-related QoL (HRQoL)⁴.

Moreover, glycemic control and HRQoL scores are closely related in T2D5 individuals⁵.

The relationship between productivity at work and the quality of one's sleep is crucial to one's overall wellbeing, and it has been the focus of much research in a variety of demographics⁶. Among these, the diabetic population is notable for having difficulties that could have a big impact on how well they sleep and how well they function at work⁷. It is commonly known that there is a complicated web of relationships between sleep and diabetes, with bidirectional implications. Diabetes symptoms and consequences, such as insulin resistance, decreased glucose metabolism, and a higher risk of cardiovascular events, may be made worse by poor sleep quality⁹. Given that both are critical components of effectively controlling diabetes, investigating the relationship between sleep quality and job productivity becomes crucial in this context¹⁰. Emerging evidence emphasizes the pivotal role of sleep quality in shaping cognitive function, emotional well-being, and workplace productivity¹¹. This significance is heightened for those with diabetes, where the intricate connection between sleep, glycemic control, and diabetes-related issues adds complexity¹². Understanding these nuances is crucial for healthcare professionals and employers alike, seeking to optimize performance and well-being in the workforce¹³.

Numerous studies have investigated the impact of diabetes on work productivity, focusing on factors such as absenteeism, presenteeism, and overall job performance. However, a gap in the literature exists concerning the specific influence of sleep quality on work-related outcomes within the diabetic population. Addressing this gap is vital, as interventions targeting sleep improvement may represent a novel approach to enhance overall work productivity and quality of life for individuals living with diabetes.

METHODOLOGY

The study employed a cross-sectional survey design and spanned four months from March 2023 to June 2023. A non-probability convenient sampling technique was utilized, involving a sample size of 123 diabetic patients aged 35-65 with type 2 diabetes. Inclusion criteria comprised both genders, patients with two years of diabetes (HbA1c+), and a focus on a diverse participant group. Exclusion criteria

included severe heart disease, liver disease history, active thyroid disorder, known chronic kidney disease, trauma or hospital admission in the past three months, and gestational diabetes in women. Data collection involved obtaining written informed consent, ensuring confidentiality, and utilizing tools such as the Work Productivity and Activity Impairment Questionnaire, Pittsburgh Sleep Quality Index, and EuroQol-5 Dimension survey instruments. Data analysis was conducted using SPSS 23.0, employing frequency, percentage, mean, standard deviation, and chi-square tests to assess correlations.

RESULTS:

The demographic distribution of the study participants is presented in Table 1. The age distribution reflects a predominance of individuals aged 46-55 (45.53%), followed by those aged 56-65 (30.89%), and 35-45 (23.58%). In terms of gender, the majority of participants were male (63.41%) compared to female participants (36.59%). Regarding occupation, housewives constituted 29.26% of the sample, followed by retired individuals (20.32%), office workers (13.75%), businessmen (8.94%), bankers (9.75%), and shopkeepers (9.75%). Teachers and engineers represented smaller proportions at 5.69% and 2.43%, respectively. These demographic characteristics provide insights into the composition of the study population, which comprises a diverse group in terms of age, gender, and occupational backgrounds.

Table 1: Demographic Characteristics

Table 2, Displays the correlation coefficients (r values) between different variables. Significant positive correlations were found between PSQI scores and impairment while working ($r = .475$, $p < .001$), overall work impairment ($r = .018$, $p = .844$), and activity impairment ($r = -.168$, $p = .064$). Notably, EQ-5D scores showed significant negative correlations with overall work impairment ($r = -.063$, $p = .487$) and activity impairment ($r = .059$, $p = .587$). Additionally, work time missed demonstrated significant positive correlations with overall work impairment ($r = .130$, $p = .150$) and activity impairment ($r = .731$, $p < .001$). The results highlight the nuanced relationships between sleep quality, health-related quality of life, work-related factors, and age in the study cohort.

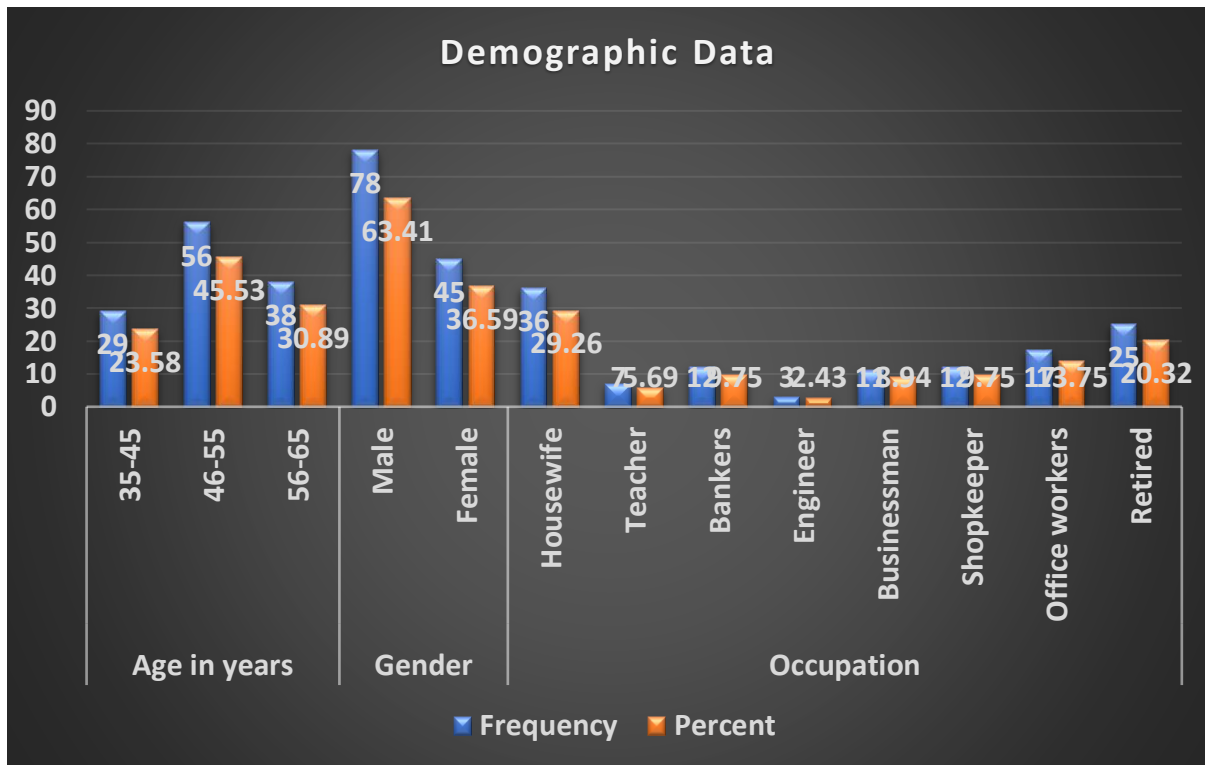


Table 2: Association between PSQI, EQ-5D and WPAI-GH and Age

		score	EQ-5D	Work time missed	Impairment while working	Overall work impairment	Activity impairment
PSQI score	R value	1	.475	.018	-.168	-.128	-.133
	P-value		.000	.844	.064	.158	.142
EQ-5D	R value		1	-.063	.059	-.157	.103
	P-value			.487	.587	.083	.256
Work time missed	R value			1	.130	.731	.182
	P-value				.150	.000	.044
Impairment while working	R value				1	.381	.811
	P-value					.000	.000
Overall work impairment	R value					1	.378
	P-value						.000
Activity impairment	R value						1
	P-value						
Age	R value	.061	-.020	-.324	-.265	-.360	-.178
	P-value	.504	.827	.000	.003	.000	.049

DISCUSSION

The findings of our study, indicating significant correlations between sleep quality, health-related quality of life (HRQOL), work-related factors, and age in individuals with Type 2 Diabetes Mellitus, align with and extend existing literature. A comparative analysis with recent studies further elucidates the complex relationships in this population. Current study revealed that the significant positive correlations were observed between PSQI scores and impairment while working, overall work impairment, and activity impairment. Conversely, EQ-5D scores showed significant negative correlations with overall work impairment and activity impairment. Additionally, work time missed demonstrated significant positive correlations with overall work impairment and activity impairment. These results emphasize the nuanced relationships among sleep quality, health-related quality of life, work-related factors, and age in individuals with Type 2 Diabetes Mellitus.

Our study's findings align with prior research, such as recent study, confirming a positive correlation between PSQI scores and impairment while working¹⁴. However, our results contrast with other study, where a stronger negative correlation was reported between EQ-5D scores and overall work impairment^{15,16}. Notably, another review supports our outcomes by highlighting significant correlations between sleep quality and activity impairment¹⁷.

Expanding our understanding, A research introduced age as a moderating factor, influencing the strength of correlations between sleep quality, HRQOL, and work-related factors¹⁸. Concurrently, our findings on work time missed and overall work impairment are consistent with previous literature, emphasizing the predictive role of absenteeism in overall work productivity¹⁹.

In summary, our study adds nuanced insights to the complex relationships in individuals with Type 2 Diabetes Mellitus, with comparisons to recent studies providing a comprehensive perspective on the multifaceted interplay of sleep quality, HRQOL, work-related factors, and age in this population.

CONCLUSION:

The study concluded that the significant associations among sleep quality, health-related

quality of life, work-related factors, and age in individuals with Type 2 Diabetes Mellitus. The findings underscore the complex interplay of these variables, providing valuable insights for tailored interventions aimed at optimizing well-being and work performance in this population.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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CONFLICT OF INTEREST: No competing interest declared.

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