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Original Article

Pain-Related Musculoskeletal Disorders among Health Care Workers at SHAR Teaching Hospital in Sulaymaniyah city

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ABSTRACT

Background and Objectives: Musculoskeletal disorders represent a significant global occupational health problem, especially among healthcare professionals engaged in physically strenuous activities such as patient handling, prolonged standing, and repetitive motions. These factors significantly affect quality of life and work efficacy. This study assesses the prevalence, anatomical distribution, severity, and associated factors of musculoskeletal pain among healthcare professionals at Shar Teaching Hospital in Sulaymaniyah City.

Method: A cross-sectional study was carried out between 15 December 2024 and 25 March 2025, including 235 nurses and physicians. Data were collected using a semi-structured questionnaire and a modified Nordic Body Map and analyzed with SPSS version 24.

Result: The findings indicated that all individuals experienced musculoskeletal discomfort in the preceding 12 months, with the lower back, feet/ankles, and neck (46.8%, 11.9%, and 22.6% respectively) identified as the most impacted areas. A majority of participants indicated experiencing moderate to severe pain (61.3%).Significant associations were identified between pain severity and several variables, including age, gender, years of experience, financial status, department, and work hours ($p < 0.01$). Although training in lifting techniques did not yield statistically significant results, a protective trend was observed. The major symptom was a gradual onset of pain (94%), commonly aggravated by prolonged standing or bending.

Conclusion: This study highlights the occupational impact of musculoskeletal disorders on healthcare workers, particularly in high-demand departments and among individuals with extended employment or financial stress.

Keywords: Musculoskeletal Disorders; Healthcare professionals; Occupational health; Severity of pain.

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INTRODUCTION

The World Health Organization (WHO) has identified musculoskeletal disorders as the primary cause of disability and limitations in daily life and work activities [1].An estimated 1.71 billion individuals are affected by musculoskeletal disorders, which are the leading cause of disability and human distress worldwide. Low back pain is the predominant cause of disability in 160 of the 204 assessed countries [2].Musculoskeletal health refers to the functional capacity of the locomotor system. Musculoskeletal impairments encompass approximately 150 different diseases and conditions affecting this system. These conditions include problems with the muscles, bones, joints, and connective tissues around them, which can make it hard to move or participate in activities. these conditions can be acute or chronic and have a big impact on quality of life and ability to perform daily tasks [3].The job of healthcare worker require a lot of physical exertion, Healthcare professionals, including nurses and doctors are more prone to musculoskeletal disorders (MSDs). Significant stress on the musculoskeletal system might result from repetitive motions, prolonged standing or sitting, and patient handling activities [4]. The global prevalence of musculoskeletal disorders (MSDs) among nurses is believed to range from 40% to 90% [5].Work-related musculoskeletal disorders (WMSDs) are prevalent among healthcare workers, especially nurses, of all reported work-related injuries [6].Globalization has significantly impacted healthcare in developed countries, resulting in the integration of various healthcare services within hospital systems. Nurses are an integral component of this system [7]. Emergency department nurses face numerous challenges stemming from demanding schedules, simultaneous care for multiple patients, unexpected fatal accidents, the imperative to provide care for critically ill individuals within constrained periods of time, and the noisy, overcrowded environment [8].Emergency department nurses must be on standby 24 hours a day to attend to patients with uncertain survival prognoses. Substantial due to their critical life-saving responsibility [9]. Nursing is identified as the foremost profession with the highest prevalence of musculoskeletal disorders globally [10].Pain is a complex subjective phenomenon shaped by biological, psychological, and social factors, can be affected not just by sensory input from tissue injury but also by personal beliefs, attention, mood and previous experiences. Modern neuroscience views pain as an unexpected phenomenon arising from the synthesis of sensory, affective, and cognitive processes inside the central nervous system. This includes the modulation of nociceptive signals via descending inhibitory and facilitator pathways, which influence the dynamic and personalized aspects of pain perception [11, 12, 13]. Pain is not merely a passive reaction to injury; it includes an active interpretation by the brain, impacted by ongoing contextual and environmental factors [14].

METHOD

A cross-sectional study was conducted among healthcare workers at Shar Hospital in Sulaymaniyah City between 15 December 2024 and 25 march 2025 to assess pain - related musculoskeletal disorders among healthcare worker. Using non-probability convenience sampling which include 235 nurses and physicians was recruited.The inclusion criteria include healthcare worker nurses and physicians who are responsible for providing direct healthcare for the patient in all departments at Shar Teaching Hospital and who have a minimum one year of experience.

The exclusion criteria include healthcare workers with pre-existing musculoskeletal disorders or injuries not related to work and Healthcare workers who were pregnant or on maternity leave. Nurses and physicians who had suffered recent trauma, injury, or serious diseases such as diabetes or disc prolapse were excluded from the study as were head nurses. A semi-structured questionnaire and modified Nordic Body Map Questionnaire were used for the data collection, which was composed of 17 items which were distributed through the following:

1-Sociodemographic characteristic: This part consists of 11 items, which include age, gender, marital Status, BMI, job title, level of educational, years of experience in healthcare setting, department work ,financial status ,work hours per week and participated of training on body mechanic course , Regarding financial status, participants were directly asked whether their current income is adequate for their needs. Responses were categorized into sufficient, barely sufficient, and insufficient. These categories are based on self-reporting rather than standardized financial scales. For the BMI formula: Weight (kg)/ [height (m)] 2

- Underweight (BMI <18.5)
- Normal (BMI 18.5-24.9)
- Overweight (BMI 25-29.9)
- Obese (BMI ≥ 30) (CDC, 2022)

2-Assessment of characters of musculoskeletal pain among healthcare professionals. This part includes 6 items which are currently have any musculoskeletal pain in the past 12 months, 9 anatomical sites and lasting for more than 3 days , how your pain started related to Pain is worse by, pain minimized by used group of medication is taken, which non-treatment for reliving pain . Object of the study:

- To identify socio-demographic characteristics of healthcare workers.
- To identify the prevalence of musculoskeletal disorders among healthcare workers.
- To find out the association between socio -demographic characteristics of healthcare workers and musculoskeletal disorders.

The content validity of the questionnaire was determined through a panel of (18) experts. The mean of their experience/ year is 17 years. Their opinions and suggestions were taken into consideration to investigate the clarity and adequacy of items. Those experts include faculty members, assistant professors, and lecturers from different specialties in the College of the Nursing/University of Sulaymani, College of Medicine/University of Sulaymani, College of Nursing/Hawler Medical University, College of Nursing /University of Kirkuk and College of Nursing / University of Raparin. Minor modifications were made based on pilot findings. According to recent methodological advice for feasibility and pilot studies (Teresi et al., 2022), about 5% - 10% of the total sample size was chosen for the pilot study (≈12 participants from 235). It was carried out during the period of 20th of November 2024 to 10th of December 2024, aimed to confirm the clarity, average time and validity and check on questionnaire reliability of the research instruments and identify potential barriers. A reliability analysis was conducted using Cronbach's Alpha in SPSS to assess the internal consistency of questionnaire items. The council of the College of Nursing approved this study. Accordingly, official permission was proposed to the Sulaimani General Directorate of Health to grant permission, consequently Shar Teaching Hospital to gain facilitation and cooperation during the data collection of this study. Consent was obtained from all nurses and physicians; their participant confidentiality and anonymity were maintained throughout the study.

All data were stored securely and accessible only to the research team. participation in the current research to gain their approval to participate in the present study. For the statistical analysis using statistical method SPSS version 24 for Windows. Cronbach's alpha significant value P< 0.05 has been used for testing the reliability of the questionnaire. Descriptive statistical data analysis (Frequency. Percentage) Inferential data analysis: Chi square Test and Fisher's exact Test. Acknowledgements My deep appreciation and profound thanks to all experts for their cooperation and guidance in constructing questionnaire of the study. Special thanks are forwarded to the direction and staff of the Shar Teaching Hospital. I would like to extend special thanks to all nurses and physicians who participated in this study

RESULTS

Table 1 shows socio-demographic characteristics of the participants. The major age group of participants was 20–39 years (86.4%), followed by participants aged 40–49 years (12.3%) and 50–59 years (1.3%). Females represented 60.4% of the sample, and males consisted of 39.6%. More than half of the participants were married (57.0%), while 43.0% were single. Regarding BMI, 60.4% showed normal weight, 31.1% were classified as overweight, 6.8% were categorized as obese, and 1.7% were classified as underweight. Nurses represented the most popular occupational category at 93.2%, while physicians accounted for 6.8%. Regarding education, 63.0% possessed a diploma, 30.6% held a bachelor's degree, and merely 6.4% indicated postgraduate qualifications.

Table (1) : Distribution of healthcare worker Socio-demographic characteristic data

Socio-characteristic data	F.	(%)
Age group		
20 - 29	90	(38.3)
30 - 39	113	(48.1)
40 - 49	29	(12.3)
50 - 59	3	(1.3)
Gender		
Male	93	(39.6)
Female	142	(60.4)
Marital status		
Single	101	(43)
Married	134	(57)
BMI		
Underweight	4	(1.7)
Normal weight	142	(60.4)
Overweight	73	(31.1)
Obese	16	(6.8)
Job title		
Nurse	217	(93.2)
Physician	16	(6.8)
Level of Education		
Diploma	148	(63)
Bachelor	72	(30.6)
Master	10	(4.3)
Doctorate	5	(2.1)

Table 2 represents the distribution of characteristics related to the professional experience. More than the half of participants had ≤10 years of experience in healthcare (60.0%), followed by 29.8% with 11–20 years, while just 10.3% reported above 20 years. One-third worked in the ICU (33.2%), with smaller proportions in emergency trauma (17.0%), emergency medicine (12.3%), and other wards. 42.1% reported their financial status as barely sufficient, 38.7% as insufficient, and only 19.1% as sufficient. Weekly hours predominantly ranged from 35 to 40 (40.4%) or from 20 to 34 (37.0%), whilst 19.6% worked fewer

than 20 hours and 3.0% exceeded 41 hours, only 25.1% engaged on body mechanics training.

Table (2): Distribution of characteristics related to professional experience

Healthcare worker characteristic	F.	(%)
Years of experience in health care setting		
≤ 10	141	(60)
11 – 20	70	(29.8)
21 – 30	22	(9.4)
≥ 31	2	(.9)
Which department do you work at SHAR Hospital		
Emergency trauma	40	(17)
Emergency medicine	29	(12.3)
Acute surgical ward	20	(8.5)
Acute medical ward	23	(9.8)
Orthopedic surgical ward	10	(4.3)
Surgical ward	15	(6.4)
Cardiothorathic ward	8	(3.4)
ICU	78	(33.2)
Dialysis	12	(5.1)
Financial status		
Sufficient	45	(19.1)
Barely sufficient	99	(42.1)
Insufficient	91	(38.7)
Work hours per week		
< 20 hr/w (e.g., part-time or minimal work hours).	46	(19.6)
20 - 34 hr/w (e.g., part-time or reduced workload).	87	(37)
35 - 40 hr/w (e.g., typical full-time work).	95	(40.4)
≥ 41 hr/w (e.g., full-time with overtime or slightly extended hours).	7	(3)
Did you participated of training regarding on body mechanic technique?		
Yes	59	(25.1)
No	176	(74.9)

Table 3 indicates important characteristics of musculoskeletal pain starting aggravating and relieving factors, and therapeutic strategies among healthcare specialists. A significant majority of individuals (94.0%) indicated that their pain developed gradually, indicating a Chronic, cumulative strain rather than an acute injury. Bending (43.0%) and lifting (13.6%) were the most commonly cited causes, while 40.9% reported no. Pain was mainly exacerbated by standing (51.9%) and bending (32.8%). Rest and sleep (60.4%) were the most commonly reported ways of pain relief, followed by exercise (22.1%). Pharmacological therapy included mainly non-opioid analgesics (41.7%) and NSAIDs (38.3%), with minimal opioid use (3.8%). Among non-pharmacological therapies, home exercises (40.9%) and acupressure (26.0%) were the most often performe. Table 4 shows significant associations between the severity of musculoskeletal pain and several socio-demographic characteristics. Age showed a significant association ($p < 0.001$), with younger healthcare worker (20–29 years) mostly experiencing mild pain, while older groups (especially 30–39 years) reported greater levels of moderate and severe pain. The gender differences were significant at ($p < 0.001$), with females indicating higher incidences of severe pain (24.6%) in contrast to males (10.8%). Marital status correlated with severity of pain ($p < 0.001$), with single individuals reporting more experiences of mild and severe pain compared to married participants. Regardless of BMI attaining statistical significance ($p = 0.127$), statistics indicated that persons with normal weight showed a wider range of severity of pain, while overweight participants reported more

moderate of pain. The job title did not significantly affect severity of pain (p = 0.875), indicating similar risks among roles. Educational background was strongly associated with severity of pain (p = 0.014), with individuals possessing higher education levels (Master's degree) reporting increased severity of pain.

Table (3): Characteristics of Musculoskeletal Pain among Healthcare Professionals.

Characteristics	F.	(%)
How did your pain start?		
Suddenly	14	(6)
Gradually	221	(94)
Related to		
Lifting	32	(13.6)
Bending	101	(43)
Fall	1	(0.4)
No apparent cause	96	(40.9)
Accident	5	(2.1)
Pain is worse by?		
Standing	122	(51.9)
Bending	77	(32.8)
Sitting	4	(1.7)
Walking	31	(13.2)
Wearing high heels shoes	1	(.4)
Pain minimized by?		
Take a rest & sleep	142	(60.4)
Standing	9	(3.8)
Exercise	52	(22.1)
Sitting	31	(13.2)
Walking	1	(0.4)
Group of medication is taken routinely?		
NSAIDs	90	(38.3)
Opioid	9	(3.8)
Non-Opioid	98	(41.7)
Non drug use	38	(16.2)
Which non- drug treatment you tried for relive pain?		
Physiotherapy	42	(17.9)
Acupressure	61	(26)
Home Exercises	96	(40.9)
Heat	36	(15.3)

Table 5 highlights significant association between the severity of musculoskeletal pain and several professional experience factors among healthcare professionals. Years of experience showed a significant association with pain severity (p < 0.001), with mild pain most commonly observed in individuals with less than 10 years of experience, while severe pain was most prevalent among those with 21–30 years, indicating accumulated work-related strain over time. The severity of pain shown significantly varied within working departments (p < 0.01), with the Dialysis (50%) and Emergency Trauma (37.5%) units reporting the highest incidences of severe pain, probably because to elevated physical demands. A strong association was found with financial state (p < 0.001); individuals with insufficient earnings reported the highest prevalence of severe pain (23.1%), thus indicating the interaction between economic stress and physical health. The number of work hours per week significantly affected severity of pain (p = 0.009), with those working standard full-time hours (35–40 hr/w) reporting the highest incidence of severe pain (25.3%). While the lifting method training not achieving statistical significance (p = 0.052), a protective tendency was observed, with trained individuals reporting decreased incidences of severe pain (11.2%) in contrast to untrained personnel (23.2%).

Table 4: Association between Socio-characteristic data and severity of musculoskeletal pain.

Variable	Severity of pain			Total	P-value
	Mild	Moderate	Vsevere		
Age group					
20 - 29	37(41.1)	43 (47.8)	10 (11.1)	90 (100)	
30 - 39	8 (7.1)	76 (67.3)	29 (25.7)	113(100)	<0.001
40 - 49	1(3.4)	22 (75.9)	6 (20.7)	29(100)	
50 - 59	0 (0)	3(100)	0 (0)	3(100)	
Gender					
Male	13 (14)	70(75.3)	10(10.8)	93(100)	<0.001
Female	33 (23.2)	74(52.1)	35(24.6)	142(100)	
Marital status					
Single	31(30.7)	49(48.5)	21(20.8)	101(100)	<0.001
Married	15(11.2)	95(70.9)	24(17.9)	134(100)	
BMI					
Underweight: BMI is less than 18.5.	0(0)	3(75)	1(25)	4(100)	
Normal weight: BMI is 18.5 to 24.9	35(24.6)	78(54.9)	29(20.4)	142(100)	
Overweight: BMI is 25 to 29.9.	8(11)	51(69.9)	14(19.2)	73(100)	
Obese: BMI is 30 or more.	3(18.8)	12(75)	1(6.2)	16(100)	0.127
Job title					
Nurse	44(20.1)	133(60.7)	42(19.2)	219(100)	0.875
Physician	2(12.5)	11(68.8)	3(18.8)	16(100)	
Educational level					
Diploma	37(25)	90(60.8)	21(14.2)	148(100)	
Bachelor	9(12.5)	43(59.7)	20(27.8)	72(100)	0 .014
Master	0(0)	6(60)	4(40)	10(100)	
Doctorate	0(0)	5(100)	0(0)	5(100)	

Table 5: Association between severity of musculoskeletal pain and professional experiences

Characteristic	Severity of pain			Total	P-value
	Mild	Moderate	severe		
Experience as healthcare worker					
<10	43(30.5)	73(51.8)	25(17.7)	141(100)	
11 - 20	3(4.3)	55(78.6)	12(17.1)	70(100)	<0.001
21 - 30	0(0)	14(63.6)	8(36.4)	22(100)	
>31	0(0)	2(100)	0(0)	2(100)	
Working department					
Emergency trauma	4(10)	21(52.5)	15(37.5)	40(100)	
Emergency medicine	2(6.9)	20(69)	7(24.1)	29(100)	
Acute surgical ward	3(15)	12(60)	5(25)	20(100)	
Acute medical ward	7(30.4)	10(43.5)	6(26.1)	23(100)	
Orthopedic surgical ward	3(30)	7(70)	0(0)	10(100)	< 0.01
Surgical ward	5(33.3)	9(60)	1(6.7)	15(100)	
Cardiothorathic ward	2(25)	5(62.5)	1(12.5)	8(100)	
ICU	20(25.6)	54(69.2)	4(5.1)	78(100)	
Dialysis	0(0)	6(50)	6(50)	12(100)	
Financial status					
Sufficient	3(6.7)	38(84.4)	4(8.9)	45(100)	
Barely sufficient	6(6.1)	73(73.7)	20(20.2)	99(100)	<0.001
Insufficient	37(40.7)	33(36.3)	21(23.1)	91(100)	
Work hours per week					
< 20 hr/w (e.g., part-time or minimal work hours).	18(39.1)	22(47.8)	6(13)	46(100)	0.009
20 - 34 hr/w (e.g., part-time or reduced work-load).	13(14.9)	59(67.8)	15(17.2)	87(100)	
35 - 40 hr/w (e.g., typical full-time work).	13(13.7)	58(61.1)	24(25.3)	95(100)	
> 41 hr/w (e.g., full-time with overtime or slightly extended hours).	2(28.6)	5(71.4)	0(0)	7(100)	
Have you received training on proper lifting techniques?					
Yes	20(25)	51(63.7)	9(11.2)	80(100)	0 .052
No	26(16.8)	93(60.0)	36(23.2)	155(100)	

Figure1 shows the distribution of musculoskeletal pain by anatomical site among healthcare workers over the past 12 months, with episodes more than three days in duration. The lower back was the most affected region, indicated by 46.8% of participants, indicating it as the primary site of occupational stress. The feet and ankles were the second most impacted (22.6%), likely due to prolonged times of standing and walking. Neck and knee pain were reported at a prevalence of 11.9% each, indicating postural and joint strain. In contrast, shoulder (3.8%), hip/thigh (2.1%), wrist/hand, and upper back pain (each 0.4%) were less common.

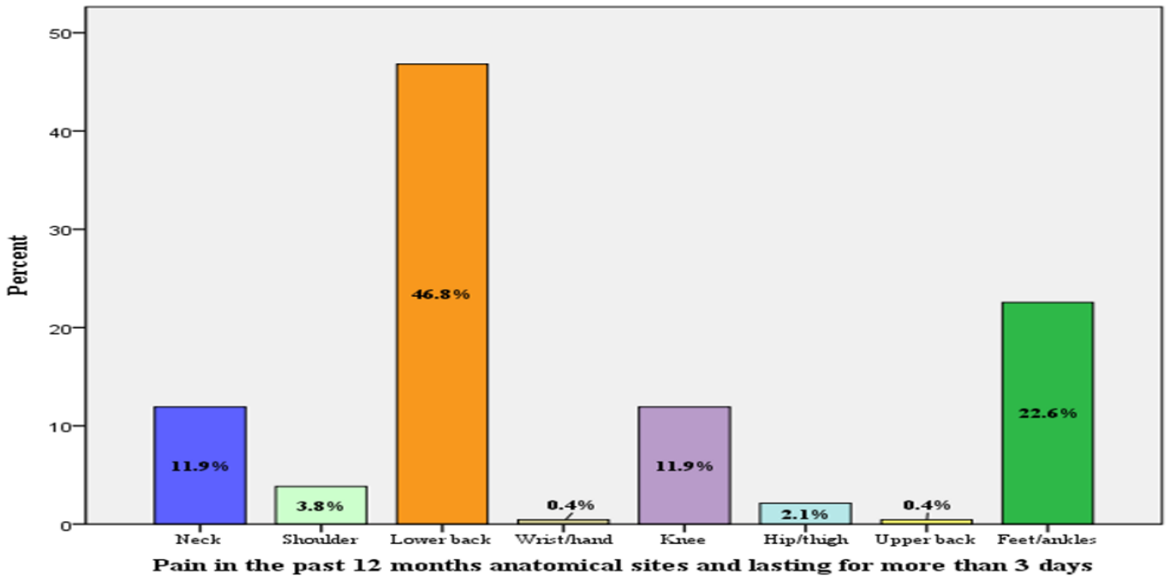

Figure 1: Distribution of Musculoskeletal Pain by Anatomical Site over the Past 12 Months (Episodes lasting >3 day

DISCUSSION

Principal findings: The present study shows a significant prevalence of musculoskeletal disorders (MSDs) among nurses and physicians, particularly affecting the lumbar back, feet/ankles, and neck. A study conducted in three teaching hospitals related to Qazvin University of Medical Sciences in Iran (2018-2019) revealed a significant prevalence of musculoskeletal problems among nurses in emergency departments the findings indicated that the lower back was the most frequently impacted region, succeeded by the neck, knees, and shoulders [15],This supports our findings. The majority of participants were young to middle-aged and primarily female. in 2017, females were more likely than males to have musculoskeletal diseases (MSDs) worldwide. The prevalence of MSDs increased steadily in older age groups [16].These findings are consistent with our results. Representing the global gender distribution in nursing. Female reported greater pain severity, possibly due to occupational pressures and increased domestic responsibilities. This finding aligns with global and regional trends demonstrating that nursing and related healthcare support roles are predominantly held by women, Female nurses are more prone to work -related musculoskeletal diseases (WRMSDs) due to their added domestic responsibilities, such as childcare and household tasks, coupled with

insufficient rest and inadequate physical activity, Women were observed twice as frequently as males during the initial phase of musculoskeletal disorder8. Result of this study agree with the present result. The findings indicated that where in which table, especially in high-intensity departments such as ICU and Emergency Trauma. The gradual onset of pain corresponds with activities such as bending and lifting. Significantly, the severity of pain was strongly associated with work-related factors including years of experience, department affiliation, financial status, and weekly hours of work. Healthcare professionals with extended years of service, inadequate salaries, and full-time or overtime duties were more prone to report severe pain levels. Regardless of the lack of statistical significance in body mechanics training, participants who underwent this training reported a reduced incidence of severe pain, indicating its potential protective benefits. Nurses generally encounter physical demands including object manipulation, equipment operation, patient lifting, repeated tasks, and extensive flexion, bending, twisting, and fast finding of this stud [17] agree with present result Prolonged standing indicates a cumulative work strain rather than separate incidents. Nurses who had irregular work schedules, worked nights often, or stayed up late, not getting enough regular exercise was also substantially linked to a greater rate of WMSDs [18].A cross-sectional study was performed including emergency registered nurses at five hospitals in Tehran, Iran, from January to April 2017. The findings revealed a substantial correlation between musculoskeletal diseases in different body areas and work schedules, as well as job satisfaction levels. The work schedule substantially impacted physical demands, efficiency, frustration, and overall workload [19].

CONCLUSION

Musculoskeletal pain, particularly affecting the lower back, feet/ankles, and neck, is highly prevalent among healthcare professionals at SHAR Teaching Hospital. Pain severity was significantly associated with age, work experience, department assignment, financial status, and work hours, highlighting the multifactorial occupational nature of these disorders. These findings emphasize the urgent need for comprehensive interventions, including ergonomic workplace modifications, mandatory training in body mechanics, improved staffing ratios, and organizational policies to support healthcare workers well-being. Future longitudinal studies with larger, randomly selected samples are needed to establish causal relationships and evaluate intervention effectiveness.

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