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RELATIONSHIP BETWEEN STRESS LEVEL AND SELF-CARE ACTIVITY AMONG PATIENTS WITH DIABETES MELLITUS AT ROEMANI MUHAMMADIYAH HOSPITAL SEMARANG

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ABSTRACT

Diabetes mellitus is a chronic non-communicable disease with increasing prevalence and a high risk of complications, requiring continuous and consistent self-care activity. However, the long-term demands of disease management may cause psychological stress, which can reduce patients' ability and adherence in performing self-care activities. This study aimed to determine the relationship between stress level and self-care activities among patients with diabetes mellitus at Roemani Muhammadiyah Hospital, Semarang. A quantitative correlational design with a cross-sectional approach was used. Data were collected using the DASS-42 and SDSCA questionnaires from 42 respondents selected through consecutive sampling. Data were analyzed using Spearman's rank correlation test. The results showed that 33.3% of respondents had normal stress levels, and 47.6% engaged in moderate self-care activities. The analysis revealed a significant relationship between stress level and self-care activity (p = 0.000; rho = -0.515), indicating a moderate negative correlation. Higher stress levels were associated with poorer self-care activity. It is recommended that healthcare professionals strengthen stress management education and self-care support, while future researchers should explore other contributing factors such as family support, health literacy, and coping strategies..

Keywords: Stress Level, Self-Care Activity, Diabetes Mellitus

INTRODUCTION

Non-Communicable Diseases (NCDs) remain the leading cause of death worldwide, accounting for approximately 71% of global mortality. One of the major contributors to NCD-related morbidity and mortality is diabetes mellitus, a chronic metabolic disease characterized by persistent hyperglycemia caused by impaired insulin secretion, insulin action, or both. Diabetes mellitus requires lifelong management because uncontrolled blood glucose levels may lead to severe microvascular and macrovascular complications, including neuropathy, nephropathy, cardiovascular disease, and

decreased quality of life[1].

The prevalence of diabetes mellitus continues to increase globally and nationally, including in Indonesia. This growing prevalence indicates not only an increasing health burden but also the need for effective long-term disease management. However, successful diabetes management is highly dependent on patients' ability to perform self-care activities consistently. Diabetes self-care activities include dietary regulation, medication adherence, physical activity, blood glucose monitoring, and foot care. These activities are essential to maintain glycemic control, prevent complications, reduce hospitalization rates, and improve patients'quality of life[2].

Despite the importance of self-care, many patients with diabetes mellitus still experience difficulties in maintaining self-care behaviors consistently. Diabetes management requires continuous behavioral adaptation, lifestyle modification, and long-term treatment adherence, which may become physically and psychologically burdensome for patients. Several factors contribute to inadequate self-care behavior, including limited knowledge, low motivation, inadequate family support, poor coping mechanisms, and psychological stress. Inadequate self-care behavior may worsen glycemic control, increase the risk of complications, and create a cycle of deteriorating physical and psychological conditions among patients with diabetes mellitus[3,4].

One of the most important psychological factors influencing diabetes self-care activity is stress. Patients with diabetes mellitus often experience stress due to lifelong medication use, dietary restrictions, fear of complications, financial burden, and changes in dialy lifestyle. Psychological stress may reduce patients' motivation, adherence, and ability to perform self-care effectively. Previous studies consistently reported that stress-related conditions negatively affect self-care behavior among patients with diabetes mellitus. Aulia et al. (2020) found a significant relationship between stress levels and self-management among patients with type 2 diabetes mellitus. Studies by Natalansyah et al. (2020) also demonstrated that higher stress levels were associated with poorer self-care behavior among patients with diabetes mellitus. Other studies also emphasized that stress management and self-management interventions are important to improve diabetes management outcomes[5,6,7].

Although several previous studies have examined stress and self-care among patients with diabetes mellitus, most studies focused on diabetes distress and self-management of community-based populations. Research specifically examining stress levels using the Depression Anxiety Stress Scale-42 (DASS-42) and self-care activity using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire among hospitalized patients with diabetes mellitus remains limited. Therefore, this study aims to analyze the relationship between stress levels and self-care activities among patients with diabetes mellitus at Roemani Muhammadiyah Hospital, Semarang. Therefore, identifying the relationship between stress and self-care activity is important to support holistic diabetes management in hospital settings[8].

RESEARCH METHOD

This study employed a quantitative correlational design with an associative approach to analyze the relationship between stress levels and self-care activity among patients with diabetes mellitus. A cross-sectional design was applied, in which data on stress levels and self-care activity were

collected simultaneously at a single point in time. The study was conducted at Roemani Muhammadiyah Hospital from November 2025 to January 2026.

The population consisted of patients with diabetes mellitus who had been diagnosed for less than one year at Roemani Muhammadiyah Hospital. Based on hospital records from March to May 2025, the average population was 42 patients. The sampling technique used in this study was non-probability consecutive sampling, in which respondents meeting the inclusion criteria were recruited consecutively until the required sample size was achieved. The final sample consisted of 42 respondents.

The inclusion criteria were patients with type 1 or type 2 diabetes mellitus diagnosed for less than one year, patients who were able to communicate verbally, patients who were compos mentis and cooperative, and patients who agreed to participate in the study. The exclusion criteria included patients with hearing impairment and visual impairment.

The independent variable in this study was stress level, while the dependent variable was self-care activity. Stress levels were measured using the Depression Anxiety Stress Scale (DASS-42) stress subscale consisting of 14 items with Likert-scale responses ranging from 0 to 3. Stress scores were categorized into normal (0-14), mild stress (15-18), moderate stress (19-25), severe stress (26-33), and extremely severe stress (≥34). Self-care activity was measured using the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire consisting of 17 items covering dietary management, physical activity, medication adherence, blood glucose monitoring, and foot care. The total scores were classified into good (81-119), moderate (41-80), and poor (0-40) self-care activity[910].

The validity and reliability of the instruments had been previously tested. The DASS-42 demonstrated good construct validity based on Confirmatory Factor Analysis (CFI = 0.931; PNFI = 0.818; PCFI = 0.825; RMR = 0.038). In terms of reliability, the DASS-42 showed excellent internal consistency with an overall Cronbach's alpha of 0.961 and a stress subscale reliability coefficient of 0.923. The Indonesian version of the SDSCA questionnaire demonstrated strong validity with a Content Validity Index (CVI) of 0.98 and acceptable reliability with a Cronbach's alpha value of 0.72[11,12].

Data collection was conducted after obtaining permission from the university and the hospital. The researcher coordinated the research schedule with hospital staff and explained the study procedures to prospective respondents. Respondents who agreed to participate were asked to sign an informed consent form before completing the questionnaires. The questionnaire was distributed directly to respondents, and assistance was provided for participants who had difficulty reading or understanding the questions. Completed questionnaires were checked for completeness before data processing. Ethical approval for this study was obtained from the Health Research Ethics Committee of Roemani Muhammadiyah Hospital Semarang with ethical clearance number EA-002/KEPK-RSR/I/2026 prior to data collection.

Univariate analysis was used to describe respondent characteristics, stress level, and self-care activity. Meanwhile, bivariate analysis was conducted using Spearman's rank correlation test to determine the relationship between stress levels and self-care activity among patients with diabetes mellitus.

RESULT AND DISCUSSIONS

The frequency distribution of respondents from Romani Muhammadiyah Hospital, Semarang.

Table 1. Frequency Distribution of the respondent

Frequency Distribution of the respondent	F	(%)
Age (years)		
17-25	2	4.8
26-35	9	21.4
36-45	4	9.5
46-55	9	21.4
56-65	10	23.8
>65	8	19.0
Gender		
Female	18	42.9
Male	24	57.1
Education		
No formal education	6	14.3
Elementary	6	14.3
Middle School or equivalent	6	14.3
High School or equivalent	16	38.1
College	8	19.0
Occupation		
Unemployed	21	50
Private Employee	11	26.2
Civil Servant	3	7.1
Self-employed	2	4.8
Farmer	2	4.8
Others	3	7.1
Routine check-up		
No	25	59.5
Yes	17	40.4
Stress Levels		
Normal	14	33.3
Mild stress	5	11.9
Moderate stress	10	23.8
Severe stress	11	26.2
Extremely severe stress	2	4.8
Self Care Activity		
Good self-care activity	9	21.4
Moderate self-care activity	20	47.6
Poor self-care activity	13	31.0

It was found that the majority of respondents were aged 56 to 65 years, accounting for 23.8%. The number of female respondents was higher, representing 57.1% of the total sample. Meanwhile, the majority of patients with diabetes mellitus

were found not to attend routine follow-up visits, accounting for 59.5%.

Stress level in patients with diabetes mellitus at Roemani Muhammadiyah Hospital, Semarang, was in the normal category by 33.3%. The self-care activity level of patients was 47.6%, indicating that the self-care activity level.

Relationship between Stress Level and Self-Care Activity of Patients with Diabetes Mellitus.

The relationship between Stress Level and Self-Care Activity at Roemani Muhammadiyah Hospital, Semarang.

Table 2. The relationship between stress levels and self-care activities in diabetes mellitus patients at Roemani Hospital Semarang December 2025 n = 42

Stress Level	Self-Care Activity								P-Value	r
	Poor		Moderate		Good		Total			
	F	%	F	%	F	%	F	%		
Normal	0	0.0	4	28.6	10	71.4	14	100.0	0.000	-0.515
Mild stress	1	20.0	3	60.0	1	20.0	5	100.0		
Moderate stress	4	40.0	6	60.0	0	0.0	10	100.0		
Severe stress	4	36.4	5	45.5	2	18.2	11	100.0		
Extremely severe stress	0	0.0	2	100.0	0	0.0	2	100.0		
Total	9	21.4	20	47.6	13	31.0	42	100.0		

The significance of the p-value was 0.000 ($p < 0.05$), indicating a statistically significant relationship between stress level and self-care activity among patients with diabetes mellitus. The Spearman's rank correlation coefficient was -0.515, which indicated a moderate negative correlation. This finding suggests that higher stress levels were associated with lower self-care activity among patients with diabetes mellitus at Roemani Muhammadiyah Hospital, Semarang. The results imply that psychological stress may reduce patients' motivation, concentration, and adherence in performing diabetes self-care activities such as dietary management, medication adherence, physical activity, blood glucose monitoring, and foot care. Consequently, inadequate self-care behavior may worsen glycemic control and increase the risk of diabetes complications. Therefore, stress management is considered an important aspect of improving self-care activities among patients with diabetes mellitus.

Relationship between Demographics, Stress Level, and Self-Care Activity of Patients with Diabetes Mellitus.

Based on Table 1, the results showed that most respondents were aged 56-65 years, accounting for 10 respondents (23.8%). Increasing age is associated with a higher risk of diabetes mellitus due to decreased insulin sensitivity and reduced pancreatic β-cell function, which may lead to impaired glucose metabolism[13]. In addition, the aging process can affect physical and cognitive function, which may influence the ability of patients to manage their disease and perform self-care activities effectively[14,15].

Based on gender characteristics, the majority of respondents were female (57.1%). Women tend to have a higher risk of developing diabetes mellitus due to factors such as increased body mass index and hormonal changes, particularly after menopause[13]. In addition, women are generally considered to be more attentive and consistent in managing their health and performing self-care activities compared to men[16,15].

In terms of educational background, most respondents had high school or equivalent education (38.1%). Educational level plays an important role in shaping an individual's understanding and ability to receive health information. Individuals with higher educational levels tend to have better knowledge regarding disease management and are more capable of implementing appropriate self-care practices[15,14].

Regarding occupational status, the majority of respondents were unemployed (50%). Occupational status is closely related to daily physical activity and lifestyle patterns. Individuals who are unemployed or have low physical activity levels may experience reduced glucose utilization by muscles, 72which can contribute to increased blood glucose levels and the development of insulin resistance[17].

Furthermore, the results also indicated that most respondents did not perform a routine medical check-up (59.5%). Routine medical check-ups are essential in diabetes management because they allow patients to monitor their blood glucose levels and receive continuous health education regarding self-care practices. Patients who regularly attend medical check-ups tend to have better knowledge and understanding of diabetes management, while poor adherence to routine check-ups is associated with inadequate blood glucose control[13,17].

Based on Table 2, this study involving 42 respondents at Roemani Muhammadiyah Hospital, Semarang, showed that most respondents experienced normal stress levels (33.3%). This condition may be associated with patients ability to utilize adaptive coping mechanisms and their acceptance of living with a chronic illness. Adequate knowledge regarding diabetes management can also help patients regulate psychological stress and maintain self-care behaviors. Adaptive coping strategies have been reported to reduce psychological stress and contribute to better glycemic control among patients with diabetes mellitus[18]. These findings are consistent with previous studies indicating that most patients with diabetes experience normal stress levels, although some may experience mild to moderate stress. Stress in individuals with diabetes mellitus may arise from the long-term demands of disease management, including dietary regulation, regular physical activity, and continuous treatment. In addition, factors such as limited economic resources, lack of family support, older age, and work-related pressures may also contribute to increased psychological burden[19,20].

In relation to these psychological conditions, the present study also found that most respondents demonstrated moderate self-care activity (47.6%). This finding suggests that despite experiencing certain levels of psychological stress, many patients are still able to maintain adequate self-care management practices. Health education provided by healthcare professionals, along with family support, may contribute significantly to patients' ability to perform consistent self-care behaviors. Effective self-care is considered essential for improving quality of life and achieving successful diabetes management[13].

Previous studies have also reported that many patients demonstrate good self-care

ability, which aligns with Dorothea Orem's self-care theory emphasizing the importance of individuals' capacity to maintain their own health[21]. However, several aspects of diabetes self-management, particularly foot care and regular blood glucose monitoring, are still not optimally practiced by some patients. Therefore, continuous education and support from healthcare professionals remain crucial to enhance patients' awareness and prevent diabetes related complications[10].

The findings of this study indicate a significant relationship between stress level and self-care activity among patients with diabetes mellitus with a disease duration of less than one year at Roemani Muhammadiyah Hospital, Semarang ($p = 0.000$; $p < 0.05$). The correlation coefficient (rho = -0.515) demonstrates a moderate negative relationship, indicating that higher stress levels are associated with lower self-care activity. This suggests that the psychological conditions play an important role in influencing patients' ability to perform diabetes self-management. Patients who are newly diagnosed with diabetes often face substantial lifestyle adjustments, including dietary regulation, medication adherence, physical activity, and routine blood glucose monitoring, which may contribute to increased psychological stress and affect their motivation to maintain self-care behaviors[22].

The cross-tabulation result further shows that respondents with normal stress levels tend to demonstrate better self-care behaviors, whereas those experiencing higher stress levels are more likely to exhibit moderate or poor self-care activity. Psychological stability may enhance patients' ability to maintain consistent diabetes management practices, including dietary control, medication adherence, and regular blood glucose monitoring. Conversely, emotional stress can reduce motivation and lead to decreased adherence to daily diabetes management routines such as physical exercise and dietary regulation. In addition, emotional burden and mental fatigue associated with higher stress levels may interfere with patients' ability to perform consistent self-care activities[23,24].

These findings are consistent with previous studies reporting a significant association between psychological stress and diabetes self-management. Wahyudi et al (2022) found a significant correlation between stress level and diabetes self-management ($p = 0.000$) with moderate correlation strength. Similarly, Azis et al (2025) reported a strong negative relationship between diabetes distress and self-care behavior ($p = 0.000$; $r = -0.827$), suggesting that increased emotional distress may reduce patients' motivation, concentration, and coping ability in managing their condition. However, family support and assistance in treatment adherence may help some patients maintain moderate self-care behaviors despite experiencing higher levels of stress[25,26].

Relationship between Demographics and Self-Care Activity of Patients with Diabetes Mellitus..

Tabel 3. The relationship between demographic data and self-care activities in diabetes mellitus

patients at Roemani Hospital Semarang December 2025 n = 42

Demographics	Self-Care Activity							
	Poor		Moderate		Good		Total	
	F	%	F	%	F	%	F	%
Age								
Late adolescence	2	100	0	0.0	0	0.0	2	100.0
Early adulthood	2	22.2	5	55.6	2	22.2	9	100.0
Late adulthood	0	0.0	3	75.0	1	25.0	4	100.0
Early elderly	3	33.3	5	55.6	1	11.1	9	100.0
Late elderly	1	10.0	5	50.0	4	40.0	10	100.0
Senior citizen	1	12.5	2	25.0	5	62.5	8	100.0
Jenis Kelamin								
Male	7	38.9	6	33.3	5	27.8	18	100.0
Female	2	8.3	14	58.3	8	33.3	24	100.0
Education Level								
No formal education	1	16.7	2	33.3	3	50.0	6	100.0
Elementary	1	16.7	3	50.0	2	33.3	6	100.0
Middle School or equivalent	3	50.0	1	16.7	2	33.3	6	100.0
High School or equivalent	3	18.8	11	68.8	2	12.5	16	100.0
College	1	12.5	3	37.5	4	50.0	8	100.0
Occupation								
Unemployed	4	19.0	8	38.1	9	42.9	21	100.0
Private sector employee	2	18.2	8	72.7	1	9.1	11	100.0
Civil servant	0	0.0	1	33.3	2	66.7	3	100.0
Self-employed/Entrepreneur	0	0.0	1	50.0	1	50.0	2	100.0
Farmer	2	100.0	0	0.0	0	0.0	2	100.0
Other	1	33.3	0	66.7	0	0.0	3	100.0
Routine Check-up								
No	9	36.0	10	40.0	6	24.0	25	100.0
Yes	0	0.0	10	58.8	7	41.2	17	100.0

Older patients, particularly those in the elderly category, tended to demonstrate better self-care activity than younger elderly groups. This finding may be related to greater experience and adaptation in managing diabetes. Men showed lower self-care activity compared to women, who generally exhibited better adherence to diabetes management. Higher educational attainment was associated with better self-care behavior, likely due to greater health literacy and understanding of disease management. Regarding occupation, self-care activity varied among respondents, suggesting that employment status alone may not determine adherence to self- care practices. Furthermore, patients who attended routine follow-up. Regular monitoring and continuous education may strengthen patients' commitment to diabetes self-management. These findings indicate that age, gender, education, and routine healthcare utilization may influence self-care activity among patients with diabetes mellitus[27].

CONCLUSION

This study found a significant relationship between stress level and self-care activity among patients with diabetes mellitus diagnosed for less than one year at Roemani Muhammadiyah Hospital, Semarang. The Spearman correlation analysis showed a moderate negative relationship (p = 0.000; rho = -0.515), indicating that higher stress levels were

associated with lower self-care activity. These findings suggest that psychological conditions play an important role in influencing patients' adherence to diabetes self-management. Therefore, stress management should be integrated into diabetes care through continuous education, psychological support, and regular monitoring to improve patients' self-care practices. Further studies with larger samples and additional variables, such as family support, coping strategies, and health literacy, are recommended to provide a more comprehensive understanding of factors affecting self-care activity.

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REFERENCE

1. B H, Akbar H, Faisal, et al. *Teori Epidemiologi Penyakit Tidak Menular*. 1st ed. Aceh: Yayasan Penerbit Muhammad Zaini, 2021.
2. Hendra1 AL, Bachtiar2 S, Nur Fauziyah3. Hubungan Self Care degan Kadar Gula Darah Pada Pasien Diabetes Militus (DM) di Desa Dukuhmaja. 2024; 2: 27–39.
3. Rahmi H, Rasyid W, Mardianti F, et al. Hubungan Self Care Activity Dengan Kadar Gula Darah Pada Pasien Diabetes Melitus Tipe 2 Di Puskesmas Andalas Padang Tahun 2023.
4. Rif'at ID, Hasneli N Y, Indriati G. Gambaran Komplikasi Diabetes Melitus Pada Penderita Diabetes Melitus. *J Keperawatan Prof* 2023; 11: 52–69.
5. Natalansyah, Wulandari2, Barto MH. Level Of Stress And Self-Care Care In Clients Of Diabetes Melitus Type 2 In Poly Disease In Blud RSUD dr . Doris Sylvanus Abstrak.
6. Aulia M. HUBUNGAN TINGKAT STRES DENGAN SELF MANAGEMENT PADA PENDERITA DIABETES MELLITUS TIPE 2. 6. Epub ahead of print 2023. DOI: https://doi.org/10.32584/jpi.v6i3.1913.
7. Gultom AB, Batubara A. The effect of self-efficacy and self-management training on efficacy and stress in diabetes mellitus patients. 2022; 3: 72–76.
8. Damayanti1 AE, Subiyanto P, Febriani DH. Hubungan Dukungan Keluarga dengan Perilaku Self- Management Pasien Diabetes Melitus Tipe 2 di Prolanis Puskesmas Depok III. 2023; 21: 188–200.
9. Cik NKL. Gambaran Tingkat Stres, Perilaku Makan dan Status Gizi Pada Mahasiswa Jurusan Gizi Poltekkes Kemenkes Riau.
10. Samosir KL. HUBUNGAN SELF CARE DENGAN KUALITAS HIDUP PASIEN DIABETES MELITUS TIPE 2 DI RUMAH SAKIT SANTA ELISABETH MEDAN.
11. Laranjeira C, Querido A, Sousa P. Assessment and Psychometric Properties of the 21-Item Depression Anxiety Stress Scale (DASS-21) among Portuguese Higher Education Students during the COVID-19 Pandemic. 2023; 2546–2560.
12. Sugiharto, Hsu YY, Toobert DJ, et al. The Validity and Reliability of The Summary of Diabetes Self-Care Activities Questionnaire: An Indonesian Version. *Indones Nurs J Educ Clin* 2019; 4: 25.
13. Suryanti, Sumara R, Adrianus Manalu T, et al. *Diabetes Melitus Dan Pencegahan Komplikasi*. Jakarta Barat, 2025.
14. Putri LR. Gambaran Self Care Activity Penderita Diabetes Melitus (DM) di Wilayah Kerja Puskesmas Srondol.
15. Yunita R. Gambaran self care pada pasien diabetes melitus di wilayah kerja puskesmas

sihepeng tahun 2024.
16. Nugroho FC, Banase EFT, Hamu AH, et al. Hubungan antara Diabetes Distress dengan Self-care Pasien Diabetes Mellitus Tipe II Puskesmas Oesapa Kota Kupang. *J Ners Univ Pahlawan* 2024; 8: 658–666.
17. Pitaloka ND. Hubungan Dukungan Keluarga dan Tingkat Stress Dengan Self Care Activity Pada Pasien Diabetes Melitus Di RSUD dr. Gondo Suwarno Ungaran. 2023; 164.
18. Lau CYK, Kong APS, Lau JTF, et al. Coping skills and glycaemic control: the mediating role of diabetes distress. Epub ahead of print 2021. DOI: 10.1007/s00592-021-01679-w.
19. Haryono M, Handayani OWK. Hubungan tingkat stres dengan kadar gula darah pada penderita Diabetes Melitus Tipe II di Puskesmas Secang I. 2021; 1: 657–665.
20. Billious R, Donnelly R, Idris I. *Handbook of Diabetes*. 2021.
21. Agustini IB, Wangi AP, Megayanti SD, et al. *Manajemen Diabetes Berbasis Self Care*. Cetakan pe. Jakarta Barat: PT Nuansa Fajar Cemerlang, 2025.
22. Murdiyanti D, Effendy C, Suhoyo Y, et al. *Sehat dengan Diarin : Dianetes Melitus Terintegritas Indonesia*. 1st ed. Bandung: Media Sains Indonesia, 2022.
23. Nuraini I, Febrianti N, Rabiah, et al. Hubungan Diabetes Distress sdengan Selffcare pada Diabetes Mellitus i. 2022; 05: 278–283.
24. Opelya NMW, Sucipto A, Damayanti S, et al. Hubungan Aktivitas Fisik Dengan Tingkat Stres Pada Pasien Diabetes Melitus Di Puskesmas Gondokusuman 1 Kota Yogyakarta. *J Ilm Keperawatan Imelda* 2020; 6: 178–187.
25. Yu JS, Xu T, James RA, et al. Relationship Between Diabetes , Stress , and Self-Management to Inform Chronic Disease Product Development : Retrospective Cross-Sectional Study Corresponding Author : 2020; 5: 1–9.
26. Hu S, Zhang Y, Poon ACY, et al. Risk factors of early-onset type 2 diabetes : A systematic review and meta-analysis. 2025; 22: 1–14.
27. Karlsson AV, Petersson T, Wickman UL. Factors Influencing Adherence to Self-Care in Patients with Type 2 Diabetes : A Systematic Literature Review. 2026; 1–23.