Factors Associated with Patient-Doctor Relationships Among Haemodialysis Patients in Peninsular Malaysia

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ABSTRACT

INTRODUCTION: Despite frequent interactions between haemodialysis patients and healthcare providers, local evidence remains limited. This study assessed patient-doctor relationships and communication among haemodialysis patients in Peninsular Malaysia and examined factors associated with relationship scores. **MATERIAL AND METHODS:** A cross-sectional study involving 640 haemodialysis patients was conducted between September 1 and October 24, 2024, using multistage random sampling across Peninsular Malaysia. Data were collected using the Patient-Doctor Relationship Questionnaire-9 (PDRQ-9) and the Doctor-Patient Communication Questionnaire (DPCQ). Multiple linear regression analysis was performed to identify associated factors. **RESULTS:** Most respondents were female (54.5%), aged 48 years or older (57.1%), Malay (47.0%), and married (58.8%), with nearly 60% reporting a monthly income below RM 4,360. The mean patient-doctor relationship score was 35.40 (SD=7.74), and the mean communication score was 51.09 (SD=8.14). After adjustment, age, educational attainment, and doctor–patient communication were significantly associated with relationship scores. Younger patients aged 18-27 years reported lower scores (adjusted β=-0.044, p=0.027), while higher educational attainment was positively associated (adjusted β=0.034, p=0.023). Doctor-patient communication emerged as the strongest predictor (adjusted β=1.163, p<0.001). Income, employment status, geographical location, and centre type were not significant. **CONCLUSION:** These findings underscore the pivotal role of effective communication in strengthening patient-doctor relationships. Targeted interventions addressing communication skills and age- and education-related disparities may enhance patient experience and satisfaction. Future research should assess the long-term clinical impact of communication improvements.

KEYWORDS: Patient-Doctor Relationship, Doctor-Patient Communication, Haemodialysis Patients, Patient-Centered Care, End-Stage Renal Disease (ESRD)

INTRODUCTION

The doctor-patient relationship is a crucial component of effective healthcare delivery, closely associated with increased patient satisfaction, improved treatment adherence, and better health outcomes.[1,2] This relationship is significant for individuals with chronic illnesses, such as those undergoing haemodialysis, who require ongoing care and frequent interactions with healthcare providers. In such settings, trust, mutual understanding, and effective communication are essential for managing both the physical and psychological challenges associated with long-term treatment.[3]

Doctor–patient communication constitutes a fundamental cornerstone of this relationship. Clear, empathetic, and culturally sensitive communication facilitates shared decision-making, enhances patients' understanding

of their medical conditions, and enables individual concerns to be adequately addressed. Previous studies have demonstrated that patients who perceive communication with their healthcare providers as more effective report higher levels of satisfaction and are more likely to adhere to prescribed treatment regimens.[4]

Nevertheless, effective communication is often impeded by barriers such as language differences, limited health literacy, and socioeconomic disparities; factors that are particularly salient in multiethnic populations such as Malaysia.

Within the Malaysian healthcare context, diversity in cultural backgrounds and language preferences may further shape patients' perceptions and expectations of medical interactions.[5] For vulnerable populations, including patients receiving haemodialysis, these factors may further complicate the patient–doctor relationship. While studies from Western countries have extensively examined the association between communication and healthcare outcomes, evidence from Malaysia remains limited, particularly in the context of chronic renal care. A systematic review has highlighted the bidirectional influence of communication on both patient and provider outcomes, underscoring the need for culturally specific research to inform locally relevant interventions. [6]

According to the Malaysian Dialysis and Transplant Registry, more than 50,000 patients were receiving haemodialysis in 2022, reflecting a growing demand for high-quality, patient-centred renal care.[7] Understanding the quality of interactions between patients and doctors in this population is therefore essential for developing strategies to enhance healthcare experiences and outcomes. Accordingly, this study aimed to assess the quality of doctor-patient relationships and doctor-patient communication among haemodialysis patients in Peninsular Malaysia, and to determine the association between sociodemographic and clinical factors and doctor-patient relationship scores.

MATERIALS AND METHODS

Study Design and Setting

A cross-sectional study was conducted from September 1 to October 24, 2024, to investigate the quality of patient-doctor interactions and communication among haemodialysis patients in Peninsular Malaysia. The study included patients receiving treatment at private and non-governmental organization (NGO)-operated dialysis centres.

Participants and Sampling

Eligible participants were Malaysian citizens aged 18 years or older with end-stage renal disease undergoing haemodialysis for more than 1 year, able to understand Malay, and who provided written informed consent. Patients with cognitive impairment, severe illness, fatigue limiting questionnaire completion, or unavailability during data collection were excluded.

A multistage random sampling approach was used. Peninsular Malaysia was divided into five regions, four of which were randomly selected. One state per region was chosen via simple random sampling. In each state, two private and two NGO-operated dialysis centres were selected using stratified random sampling. From each centre, 40 patients were randomly recruited, yielding 640 participants.

Sample Size Determination

Sample size calculations were performed for all study objectives. As the objectives included both estimating mean scores and examining associated factors, the required sample size was determined using the population

means formula and adopted for this study. The sample size was calculated using the formula $n = (Z\alpha/2 \times SD/\Delta)$.[2] Assuming a standard deviation (SD) of 0.68 based on a previous study, a margin of error (Δ) of 0.06, and a 95% confidence level ($Z\alpha/2=1.96$), the minimum required sample size was 497. To account for an anticipated non-response rate of 20%, the target sample size was increased to 618. Ultimately, 640 patients were successfully recruited for the study.

Instruments

Two established instruments were used to assess patient–doctor relationships and doctor–patient communication.

The Patient–Doctor Relationship Questionnaire-9 (PDRQ-9) is a widely used instrument designed to measure the quality of the therapeutic relationship from the patient's perspective.[7] The questionnaire consists of nine items covering key relational domains, including trust, perceived support, mutual understanding,

accessibility, and satisfaction with care. Each item is rated on a 5-point Likert scale from 1 (not at all appropriate) to 5 (totally appropriate), yielding a total score of 9 to 45. Higher scores indicate a stronger patient-doctor relationship.

This study used the Malay version of the PDRQ-9 (MyPDRQ), which was translated and culturally adapted according to internationally recommended guidelines. The process involved independent forward and backward translations, synthesis, and expert panel review (n=5) to ensure semantic, conceptual, and cultural equivalence.

Pre-testing and cognitive debriefing were conducted among haemodialysis patients (n=30) to assess clarity, relevance, and comprehensibility of the translated items. Confirmatory factor analysis supported a unidimensional structure with excellent model fit (RMSEA=0.025, SRMR=0.030, CFI=1.000, TLI=1.000), and internal consistency reliability was high (Raykov's rho=0.906), indicating strong construct validity and reliability.[8]

Doctor-patient communication was assessed using the Doctor-Patient Communication Questionnaire (DPCQ), originally developed to evaluate patients' perceptions of doctors' communication behaviours.[9] The 15-item instrument encompasses both informational and relational domains, including listening skills, clarity of explanations, encouragement of patient expression, respect, reassurance, and shared decision-making. Items are rated on a 4-point Likert scale (1 = no to 4 = yes), producing total scores ranging from 15 to 60, with higher scores reflecting better perceived communication quality.

The Malay version of the DPCQ (MyD-PCQ) used in this study underwent an identical translation and cultural adaptation process, involving two forward translators, two backward translators, and expert panel review, followed by pre-testing among haemodialysis patients to ensure clarity and contextual

appropriateness. Psychometric evaluation demonstrated excellent construct validity based on confirmatory factor analysis ($\chi^2/df = 1.25$, SRMR=0.037, RMSEA=0.029, CFI=0.982, TLI=0.979), with high internal

consistency reliability (Raykov's rho=0.887), supporting its suitability for use in the Malaysian haemodialysis setting.[10]

Four descriptive items were included to assess patients' general perceptions of doctor performance, covering agreement with treatment, satisfaction, accessibility, and readiness of care. Responses were recorded as binary ("Yes/No") and analysed descriptively. Results are presented in Figure 1. These items were not combined into a composite score nor included in the regression analyses.

Data Collection

Centre coordinators supplied lists of eligible patients, from which participants were randomly selected using computer-generated numbers. Questionnaires were completed during scheduled sessions with researcher assistance available. Data were checked on-site for completeness, and replacements were randomly drawn when necessary.

Statistical Analysis

Data were entered in Microsoft Excel and analysed using IBM SPSS Statistics version 29. Sociodemographic characteristics were summarised descriptively, with continuous variables reported as means (SD) and categorical variables as frequencies (%). Household income was classified based on the national median household income reported by the Department of Statistics Malaysia (USD 1 = RM 4.43 as of 22 March 2025).

Multiple linear regression analysis was performed to identify factors associated with doctor-patient relationship scores. Independent variables included sociodemographic characteristics, dialysis-related factors, and doctor-patient communication scores. Results were reported as regression coefficients with 95% confidence intervals and p-values, with significance set at $p<0.05$.

Model assumptions were assessed using standard diagnostic procedures. Residual distributions were examined using histograms and normal Q-Q plots, while linearity and homoscedasticity were evaluated through scatterplots of observed versus predicted values. Multicollinearity was assessed using variance inflation factors (VIF), with values below 10 indicating acceptable levels.

The PDRQ-9 total score was analysed as a continuous variable without applying predefined cut-off points. Higher scores indicate more positive doctor-patient relationships.

RESULTS

Participant Characteristics

This study included 640 patients undergoing haemodialysis treatment. The sample was evenly distributed across four Malaysian states, with 160 participants (25.0%) each from Johor, Kedah, Kelantan, and Selangor.

An equal proportion of participants received treatment at private dialysis centres (320 participants, 50.0%) and NGO-operated centres (320 participants, 50.0%).

Overall, 54.5% of participants were female, and 57.1% were aged 48 years or older. The ethnic composition was predominantly Malay (47.0%), followed by Chinese (23.8%), Indian (14.2%), and other ethnic groups (15.0%). Most participants were married (58.8%) and had attained at least a diploma-level education (60.6%).

Regarding employment status, 22.0% were housewives, 22.0% were unemployed, and 20.8% were employed in the private sector. Approximately 59.8% of participants reported a monthly household income of less than MYR 4,360. Detailed participant characteristics are presented in Table I.

Table I: Sociodemographic characteristics of the study participants.

Variables	n (%)
Gender	
Male	291 (45.5)
Female	349 (54.5)
Age group (years)	
18 – 27	106 (16.6)
28 – 37	82 (12.8)
38 – 47	87 (13.6)
48 – 57	154 (24.1)
≥ 58	211 (33.0)
Ethnicity	
Malay	301 (47.0)
Chinese	152 (23.8)
Indian	91 (14.2)
Others	96 (15.0)
Marital status	
Single	88 (13.8)
Married	376 (58.8)
Widow / Widower	176 (27.5)
Education level	
O level	130 (20.3)
A level	94 (14.7)
Diploma	221 (34.5)
Degree	167 (26.1)
Master	19 (3.0)
PhD	9 (1.4)
Type of occupation	
Government	57 (8.9)
Private	133 (20.8)
Self-employed	125 (19.5)
Housewife	141 (22.0)
Student	43 (6.7)
Not working	141 (22.0)
Income (MYR)	
1000 to 4360	383 (59.8)
4361 to 9620	191 (29.8)
More than 9621	66 (10.3)

Perception of Doctor Performance

Patients' perceptions of doctor's performance were assessed using four descriptive binary (yes/no) items to provide contextual insight into patients' overall satisfaction with haemodialysis care.

Overall, participants reported highly favourable perceptions of their doctors. The majority agreed with the treatment provided (87.4%), expressed satisfaction with the services received (87.7%), perceived their doctors as easily accessible (89.4%), and reported that their doctors were ready to provide care when needed (90.0%). These findings are presented in Figure 1.

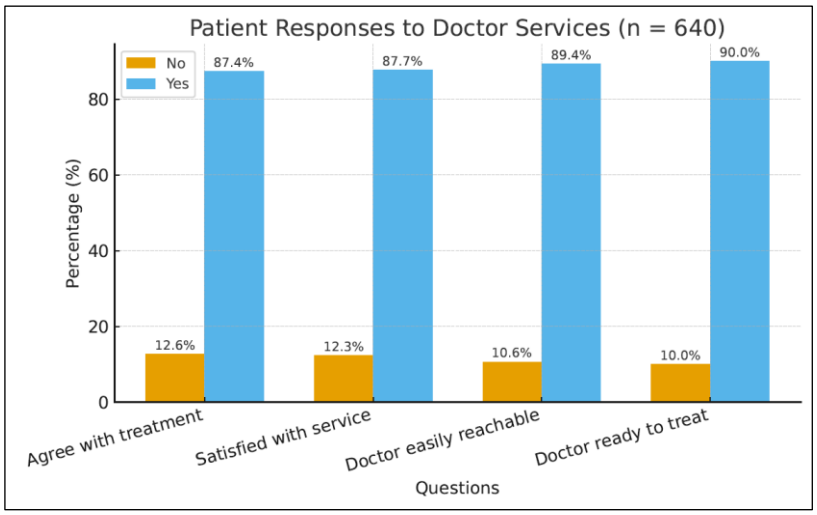

Figure 1: Participants' Perception of Doctors in Haemodialysis Care.

Patient-Doctor Relationship and Communication Scores

The mean PDRQ score was 35.40 (SD=7.74; 95% CI: 34.80–36.00), indicating a positive perception of the doctor-patient relationship. The DPCQ yielded a mean score of 50.97 (SD=8.20; 95% CI: 50.33–51.60), reflecting high perceived communication quality. Detailed item-level scores for both instruments are presented in Tables II and III.

As shown in Table II, patients reported generally positive doctor-patient relationships, with trust, support, and satisfaction scoring highest, while accessibility and time availability scored comparatively lower, indicating areas for improvement.

Table II: Doctor-Patient Relationship Questionnaire (PDRQ) score by items

Item no	Item	Mean (SD)
1	My Doctor helps me	4.00 (1.22)
2	My Doctor has enough time for me	2.96 (1.42)
3	I trust my Doctor	4.32 (1.09)
4	My Doctor understands me	4.2 (1.12)
5	My Doctor is dedicated to help me	4.36 (1.07)
6	My Doctor and I agree on the nature of my medical symptoms	4.18 (1.08)
7	I can talk to my Doctor	4.22 (1.19)
8	I feel content with my Doctor's treatment	4.13 (1.21)
9	I find my Doctor easily accessible	2.91 (1.37)

Table III: Doctor-Patient Communication Questionnaire (DPCQ) score by items

Item no	Item	Mean (SD)
1	Did the doctor listen to you carefully during the consultation?	3.71 (0.88)
2	Did the doctor allow you to talk without interrupting you?	3.80 (0.74)
3	Did the doctor encourage you to express yourself / talk?	2.55 (1.11)
4	Did the doctor examine you thoroughly?	3.79 (0.67)
5	Do you feel that the doctor understood you?	2.50 (1.12)
6	Was it easy to understand what the doctor said?	3.75 (0.76)
7	Do you feel you were given all the necessary information?	3.67 (0.83)
8	Did the doctor explain the advantages and disadvantages of the treatment or care strategy?	2.54 (1.06)
9	Did the doctor involve you in the decision-making?	3.73 (0.74)
10	In your opinion, did the doctor have a reassuring attitude and way of talking?	2.49 (1.09)
11	Do you think the doctor was in general respectful?	3.67 (0.84)
12	Did the doctor make sure that you understood his explanations and instructions?	3.66 (0.78)
13	Do you think the doctor told the whole truth?	3.69 (0.79)
14	Do you have confidence in this doctor?	3.68 (0.89)
15	Did the doctor reply to all your expectations and concerns?	3.70 (0.79)

Table III summarises patients' perceptions of doctor–patient communication. Items related to doctors' clarity of explanations, attentiveness, and respectful communication demonstrated higher mean scores, reflecting generally favourable communication practices. Lower scores were observed for items related to shared decision-making and encouraging patient expression, indicating that opportunities remain to further enhance patient involvement during clinical consultations.

Factors Associated with Patient-Doctor Relationship Scores

Table IV summarises the simple and multiple linear regression analyses of factors associated with patient–doctor relationship scores. At the univariable level, younger age, particularly among patients aged 28–37 years, and lower educational attainment were significantly associated with lower relationship scores. Conversely, higher doctor–patient communication scores showed a strong positive association with relationship outcomes.

In the multiple linear regression model, doctor–patient communication remained the strongest predictor of patient-doctor relationship quality (adjusted β=1.17; 95% CI: 1.14-1.19; $p<0.001$). Compared with patients aged 58 years or older, those aged 18–27 years reported significantly lower relationship scores (adjusted β=−0.05; 95% CI: −0.09 to −0.02; p=0.025). Educational attainment also showed a significant association: patients with lower education levels reported poorer patient–doctor relationship scores, while higher educational attainment was associated with more favourable relationship scores (adjusted β=0.04; 95% CI: 0.02 to 0.07; p=0.020).

In the adjusted model, employment status, income level, geographical location, and dialysis centre type were not significantly associated with patient-doctor relationship scores. No interaction effects were detected, and multicollinearity diagnostics indicated acceptable model stability (VIF: 1.07-1.72). The final model explained 95.8% of the variance in relationship scores.

Table IV: Factors associated with Patient-Doctor Relationship Scores

Variables	Crude β (95% CI)	p-value	Adjusted β (95% CI)	p-value
Gender				
Female	Ref			
Male	0.01 (-0.12, 0.13)	0.925		
Age group (years)				
18 – 27	0.05 (-0.65, 0.38)	<0.001	-0.05 (-0.09, -0.02)	0.025
28 – 37	-0.22 (-0.35, -0.08)	0.002	-0.03 (-0.07, 0.01)	0.110
38 – 47	0.03 (-0.12, 0.17)	0.712	0.01 (-0.04, 0.06)	0.610
48 – 57	-0.14 (-0.29, 0.01)	0.060	-0.02 (-0.06, 0.02)	0.210
≥ 58	Ref		Ref	
Ethnicity				
Malay	Ref			
Chinese	-0.01 (-0.15, 0.12)	0.837		
Indian	-0.01 (-0.15, 0.14)	0.932		
Others	-0.04 (-0.19, 0.11)	0.578		
Marital status				
Married	Ref			
Single	-0.03 (-0.20, 0.15)	0.763		
Widow / Widower	-0.05 (-0.18, 0.08)	0.456		
Education level				
Secondary	-0.64 (-0.75, -0.52)	<0.001	0.04 (0.02, 0.07)	0.02
Tertiary	Ref		Ref	
Type of occupation				
Employed	Ref		Ref	
Non-employed	-0.34 (-0.43, -0.23)	<0.001	-0.01 (-0.05, 0.03)	0.577
Income (MYR)				
1000 to 4360	0.22 (0.09, 0.04)	<0.001	0.03 (-0.02, 0.05)	0.068
4361 to 9620	-0.07 (-0.19, 0.05)	0.265	-0.01 (-0.05, 0.03)	0.520
More than 9621	Ref		Ref	
Location				
Johor	Ref			
Kedah	0.03 (-0.11, 0.16)	0.683		
Kelantan	-0.04 (-0.11, 0.09)	0.522		
Selangor	-0.09 (-0.22, 0.05)	0.125		
Type of dialysis center				
Private	Ref			
NGO-operated	-0.06 (-0.18, 0.06)	0.299		
Patient-Doctor Communication score	1.19 (1.16, 1.21)	<0.001	1.17 (1.14, 1.19)	<0.001

Ref – reference group; β - beta coefficient; CI – confidence interval

DISCUSSION

The strong positive association between patient–doctor relationship scores and doctor–patient communication underscores the central role of interpersonal interactions in chronic disease management. This finding aligns with extensive literature showing that effective communication enhances patient satisfaction, supports shared decision-making, and improves treatment adherence. [8-10] In haemodialysis care, characterised by recurrent and long-term clinical encounters, consistent, high-quality communication is especially critical for building trust and sustaining collaborative therapeutic relationships.

These findings are consistent with Malaysian research highlighting communication as a key determinant of trust, satisfaction, and patient engagement in chronic care settings. [11] Within Malaysia's culturally diverse and

multilingual healthcare environment, communication quality becomes even more significant, as linguistic and cultural differences may shape patients' perceptions and experiences of care.

Age and educational attainment emerged as significant factors influencing the patient-doctor relationship. Younger patients, particularly those aged 18-27 years, reported lower relationship scores, potentially reflecting generational differences in expectations. Younger individuals often prefer more interactive, participatory communication styles and may have stronger expectations for autonomy and involvement in decision-making. [12-13]

Educational attainment demonstrated a similar pattern. Patients with lower educational levels reported less favourable relationships, likely reflecting differences in health literacy, communication confidence, and engagement capacity rather than education itself. [14-15] Patients with higher educational attainment may be more comfortable expressing concerns and participating actively in consultations, thereby facilitating clearer communication. [16] Conversely, those with lower educational attainment may face challenges understanding complex medical information, particularly in the technically demanding context of haemodialysis care. Without tailored communication strategies, consultations may be perceived as less collaborative. [14]

The association between younger age and lower relationship scores is consistent with regional Asian studies, suggesting that younger patients often have higher expectations regarding information exchange and participatory decision-making. [15,17,18] Older patients may place greater emphasis on relational continuity and trust. Similarly, the positive association between higher educational attainment and stronger patient–doctor relationships has been documented in Malaysian and regional studies. [11,14] These findings reinforce the need for context-sensitive communication strategies.

Evidence from Malaysia and neighbouring Southeast Asian countries has identified persistent communication challenges related to language diversity and disparities in health literacy. [14-19] Such factors may influence patients' understanding and engagement. The present findings therefore support regional evidence emphasising the importance of strengthening healthcare providers' communication competencies. [16]

Employment status, income level, geographic location, and dialysis centre type were not significantly associated with relationship scores, suggesting that interpersonal and communication factors may exert a stronger influence than structural or socioeconomic indicators.

These results highlight the need for targeted strategies to enhance communication practices, including structured training programmes focusing on active listening, clarity, and culturally sensitive communication. [20-22] Complementary tools such as visual aids, simplified educational materials, and patient feedback mechanisms may further improve understanding and engagement.

Communication should be viewed not merely as a technical skill but as a relational mechanism shaping patient experiences. The disparities observed among younger, less educated patients underscore the importance of differentiated communication approaches. Integrating patient-centred strategies into routine clinical practice may not only improve satisfaction but also enhance long-term adherence.

This study's strengths include its large, multi-regional sample and the use of validated instruments. However, the cross-sectional design limits causal inference, while self-reported data may introduce bias. Excluding patients from government-operated dialysis centres may affect generalisability. Future longitudinal studies with broader sampling are recommended. [23-25]

CONCLUSION

This study underscores the pivotal role of effective communication in strengthening patient–doctor relationships among haemodialysis patients in Malaysia. While relational experiences were generally positive, younger patients and those with lower educational attainment reported comparatively less favourable interactions. These disparities highlight the need for patient-centred communication strategies tailored to sociodemographic differences. Targeted interventions, including communication training for healthcare professionals and health literacy enhancement, may improve patient experiences and engagement. Future research should incorporate public healthcare settings and longitudinal designs to examine sustained relational and clinical outcomes.

List of abbreviations

DPCQ: Doctor-Patient Communication Questionnaire
NGO: Non-Governmental Organization
PDRQ: Patient-Doctor Relationship Questionnaire
SD: Standard Deviation
VIF: Variance Inflation Factor
CI: Confidence Interval
MYR: Ringgit Malaysia

DECLARATIONS

Data availability

The datasets used and/or examined in this research can be obtained from the corresponding author if a reasonable request is made.

Competing interests

The authors declare that they have no conflicts of interest.

AUTHOR CONTRIBUTIONS

MII conceived and designed the study, supported its implementation, performed data analysis and interpretation, and critically revised the manuscript before final approval. AFFAA managed data collection, drafted the manuscript, and contributed to data analysis. NMY was involved in data analysis and interpretation. AIAR assisted in study design and provided critical revisions to the manuscript. All authors read and approved the final manuscript.

FUNDING

This study received no external funding and was self-sponsored by the authors.

INSTITUTIONAL REVIEW BOARD (ETHIC COMMITTEE)

Ethical approval for this research was granted by the Human Research Ethics Committee at Universiti Sains Malaysia (USM/JEPeM/KK/24020217). Every participant provided written informed consent prior to participating in the study. All information was anonymized and securely stored in compliance with the ethical guidelines outlined in the Declaration of Helsinki.

ACKNOWLEDGEMENTS

We would like to express our heartfelt gratitude to the management of Hospital Pakar Universiti Sains Malaysia and all participating haemodialysis centres for their support and permission to conduct this study. We also extend our appreciation to all respondents for their valuable participation and contribution to the research.

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