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The effect of social network diversity and social support on the thriving of healthcare workers

Sosyal ağ çeşitliliği ve sosyal desteğin sağlık çalışanlarının gelişimine etkisi

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ABSTRACT

Aim: The well-being of healthcare workers is a critical indicator in the provision of high-quality care. Although researchers have stressed the importance of social interactions and social support, scarce data exist about their effects on healthcare workers' well-being. In this study, we aim to advance the research on the relationships between social network diversity (SND), social support, and thriving.

Methods: In a cross-sectional design, an anonymous online link was shared among healthcare workers in a university hospital. The survey included questions on demographics, medical diseases, items from the social network index, the multidimensional perceived social support scale, and the brief and comprehensive inventories of thriving scales.

Results: A total of 103 individuals participated in the study (median age, min-max=33 (18-57); male/female = 33/70). Men and women did not differ in SND, perceived social support, or thriving scores. The brief inventory of thriving demonstrated healthcare workers older than 38 years exhibited higher scores in thriving compared to those younger than 27 years (p=0.001). According to comprehensive inventory of thriving, belonging (p=0.032), skills (p=0.006), self-worth (p=0.048), meaning and purpose (p<0.001), optimism (p=0.009), life-satisfaction (p=0.012), and positive emotions (p=0.042) differed by age groups. SND (r=.56, p<0.001) and perceived social support (r=.53, p<0.001) were positively correlated with thriving. After adjusting for potential confounders, SND, perceived social support, and age accounted for 46% of the total effects on thriving.

Conclusion: This study expands on the literature and provides evidence that by increasing the diversity of social networks and improving the quality and functionality of social support, a significant and positive impact on HCWs' well-being may be achieved.

Keywords: social networks, psychological well-being, healthcare workers, social support, eudaimonism, thriving

ÖZ

Amaç: Sağlık çalışanlarının refahı, verilen sağlık hizmetinin yüksek nitelikli olmasını sağlayan çok önemli bir göstergedir. Araştırmacılar sosyal etkileşimlerin ve sosyal desteğin önemini vurgulamıştır ancak, bu etkenlerin sağlık çalışanlarının refahına etkisini araştıran çalışmalar kısıtlı kalmıştır. Bu çalışmada sosyal ağ çeşitliliği, sosyal destek ve sağlık çalışanlarının gelişimi arasındaki ilişkiyle ilgili araştırmaları bir ileriye taşımayı amaçladık.

Yöntemler: Kesitsel bir tasarımda, bir üniversite hastanesindeki sağlık çalışanları arasında anonim çevrimiçi bir bağlantı paylaşıldı. Anket demografik özellikler ve tıbbi hastalıklarla ilgili sorular ve sosyal ağ göstergesi, çok boyutlu algılanan sosyal destek ölçeği, kısa ve kapsamlı gelişim envanterlerine ait maddeleri kapsamaktaydı.

Bulgular: Çalışmaya toplam 103 kişi katıldı (ortanca, en düşük-en yüksekyaş = 33 (18-57) (erkek/kadın = 33/70). Erkeklerin ve kadınların sosyal ağ çeşitliliği, algılanan sosyal destek, ve gelişim puanları arasında anlamlı fark saptanmadı. Kısa gelişim envanterine göre 38 yaş üzerindeki sağlık çalışanları, 27 yaşından genç olanlara kıyasla daha yüksek gelişim puanları gösterdi (p=0.001). Kapsamlı gelişim envanterine göre aidiyet (p=0.032), beceriler (p=0.006), öz değer (p=0.048), anlam ve amaç (p<0.001), iyimserlik (p=0.009), yaşam doyumu (p=0.012) ve olumlu duygular (p=0.042) alt ölçekleri yaş grupları arasında farklılık gösterdi. Sosyal ağ çeşitliliği (r=.56, p<0.001) ve algılanan sosyal destek (r = .53, p<0.001) gelişimle pozitif yönde ilişkiliydi. Olası karıştırıcılar kontrol edildikten sonra, sosyal ağ çeşitliliği, algılanan sosyal destek ve yaş, gelişim üzerindeki toplam etkinin % 46' sını oluşturmaktaydı.

Sonuç: Çalışmamız sosyal ağ çeşitliliğini arttırarak ve alınan sosyal desteğin niteliğini ve işlevselliğini geliştirerek, sağlık çalışanlarının refahı üzerinde anlamlı ve olumlu bir etki yaratılabileceği bulgularıyla literatüre katkı sağlamaktadır.

Anahtar sözcükler: sosyal ağlar, psikolojik refah, sağlık çalışanları, sosyal destek, mutlulukçuluk, gelişim

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INTRODUCTION

The parameters of health and well-being and their connections to individuals' social interactions have been investigated for many years [1]. Diversified social networks have been shown to relate to greater resistance to communicable diseases [2]. A large prospective cohort study indicated that mortality risk is higher for people with fewer strong and weak ties [3]. The mechanisms of these relations are thought to be connected to evidence that social networks are linked to a greater amygdala volume [4] and myelin integrity in the brain, which may explain why social networks impact so many different areas of health [5]. Aside from the structural aspects of social networks, the content of support received from these networks has a considerable impact on well-being [6]. Supportive relationships are deemed to be among the personal factors affecting the well-being of healthcare workers (HCWs) as well [7].

Researchers have defined well-being in the light of two major views: the hedonic view and the eudaimonic view. The first view includes subjective satisfaction, the sensation of pleasure against displeasure, and all assessments of the good/bad components of life. The second one focuses on positive functioning, which includes such elements as recognition of one's qualities and abilities, enlightened self-awareness, actualizing oneself, purpose, and meaning in life [8]. Sue and colleagues combined the hedonic and eudaimonic views, thus including the subjective and psychological well-being into a holistic and positive approach. They defined this construct as "thriving"—the condition of social, mental, and physical positive functioning at its peak. The thriving measures, the comprehensive inventory of thriving (CIT), and the brief inventory of thriving (BIT) outperformed current scales in forecasting a wide range of health outcomes, including objective and self-reported health status, health behaviors, and physical functioning [9]. Arslan and colleagues found that university students who had more severe psychological symptoms had fewer positive psychological domains in CIT and BIT [10]. These scales have been used to compare positive psychological health across different cultures [11].

The well-being of HCWs is a critical quality indicator in the provision of high-quality healthcare [12]. Unfortunately, there is a scarcity of information on HCWs' well-being, social network, and social support. Researchers have stressed the importance of factors in shaping eudaimonic well-being in employees of the mental health care system in the Netherlands; however, this study did not examine the relationships between well-being and social networks or social support [13]. In another study examining HCWs' well-being, the experience of eudaimonic feelings during patient-provider interactions, rather than simply experiencing increases in happy emotions and decreasing negative ones, was found to be important for the well-being of HCWs [14]. Several studies sought to determine the effects of work-related social support from co-workers and supervisors, in contrast to the social support from close ties [15]. Another heavy focus in this literature has been on COVID-19 and resilience [7].

In light of the scarcity of relevant data, we conducted this study to explore the relationship between social network diversity (SND), perceived social support, and thriving in HCWs. We hypothesized that thriving is positively influenced by both SND and perceived social support. By identifying the role and extent of these relationships, scalable prevention and intervention studies can be developed to address the overall well-being of HCWs.

MATERIAL AND METHODS

Study design and setting

This cross-sectional study focused on doctors, nurses, and auxiliary staff of a prominent university hospital. A convenience sampling method was used to recruit participants. Anonymous data were collected once with a Qualtrics link (https://www.qualtrics.com) to a self-administered online survey; the link was sent to the institutional email addresses via the general e-mail group of the hospital. No exclusion criteria were used. No incentives were provided. Participants gave their informed consent before the questionnaire was administered. The study was carried out per good scientific standards and was approved by the university's ethics committee (2019.149.

IRB3.088).

Measures and study variables

Besides the established questionnaires and scales, the survey consists of questions on sociodemographic information and medical diseases.

Social network index (SNI)

The SNI evaluates a social network's diversity and size. In this study, we examined the diversity dimension of the SNI, which included roles in 12 types of social interactions: spouses, parents, in-laws, children, other close relatives, close neighbors, friends, co-workers, schoolmates, volunteers, members of non-religious groups, and religious groups. Each relationship was awarded a score, with the highest possible score set at 12 [2]. As for a network's diversity, three or fewer social roles are classified as limited, four or five social roles correspond to medium, and six or more social roles are counted as a diverse social network. The SNI was first translated into Turkish by two members of the study group and then translated back to English by another member, who was fluent in English and who was not part of the first translation. The index was completed by two other people who were not part of the study. Inconsistencies in expressions and misunderstandings were resolved until the final version was reached. As it was an index, no reliability or validity study was needed to verify its characteristics.

Multidimensional Scale of Perceived Social Support (MSPSS)

MSPSS determines the perceived sufficiency of social support from three different sources. We use 12 items to assess three different types of support: i) family (items 3, 4, 8, and 11), ii) significant others (items 1, 2, 5, and 10), and iii) friends (items 6, 7, 9, and 12). Each item is graded between 1 (very strongly disagree) and 7 points (very strongly agree). The scale's overall score was calculated by adding the sub-dimension scores. The sub-dimensions of the scale have scores ranging from 4 to 28, while the overall scale score is between 12 and 84. Higher ratings imply a greater sense of social support. Eker and colleagues have demonstrated the reliability, validity, and factorial structure of the Turkish version of the revised MSPSS [16].

The comprehensive and brief inventory of thriving scale (CIT)

The CIT is a versatile well-being scale consisting of 54 questions. It measures 18 areas of psychological functioning: support, community, trust, respect, loneliness, belonging, engagement, skills, learning, control, accomplishment, self-efficacy, self-worth, meaning, purpose, optimism, and life satisfaction. The development of this scale was motivated by the fact that most earlier measures of psychological well-being focus on only a few positive dimensions. In contrast, CIT measures psychological well-being across a wide range and is useful to researchers and health practitioners, due to its ability to predict important health outcomes, given its holistic approach [9]. A shorter scale with 10 key psychological well-being factors was derived from CIT, namely, the Brief Inventory of Thriving (BIT). BIT is a quick-to-complete tool that may be utilized in initial patient assessments as a brief screening tool to inform on mental health and provide actionable guidance. The validity and reliability of CIT and BIT were tested with data collected from 11 distinct cultures (the United States, Turkey, Spain, Singapore, Russia, Mexico, India, Germany, China, Australia, and Argentina). Turkish adaptation and validation have been carried out by Arslan [10]. We chose the BIT score as the primary outcome, as the mono-dimensional scale was recommended over the multidimensional scale of the CIT; this, in turn, is because of the BIT's superior psychometric properties in the original and successive validations [17], and the fit indices of its single-factor solution were observed to be sufficient for all cultures [11].

Statistical Analysis: We used IBM's Software Package for Social Sciences Statistics for Windows, Version 26.0 (SPSS, Armonk, NY, USA), to examine the data we had collected. The Shapiro Wilk test was used to check the normality of the variables. Descriptive statistics of the categorical variables are reported as frequencies and percentages. When reporting descriptives of continuous variables, median, minimum, maximum,

and percentiles were used. Missing data were removed on an analysis-by-analysis basis, and only valid percentages were given. Categorical variables were compared using the Chi-Square test and Fisher's Exact test. The Mann-Whitney U test was performed to compare medians of two non-normally distributed continuous variables; for medians of more than two, the Kruskal Wallis test was used. Correlations between the variables were examined with Spearman correlation coefficients. The associations between multiple independent variables and the BIT score were first examined using univariate analysis. Then, those with p-values of less than 0.25 were further explored with multivariate general linear models. Statistical significance is defined as a p-value of less than 0.05 (two-tailed). We carried out a priori sample size calculation to perform a simple correlation r (r=0.5) of N observations. The needed sample size was 29 (n=29), calculated using a two-sided test with a 5% significance level (α =0.05) and an 80% power (β =0.2). For the generalized linear model, a sample size of a minimum of 60 people in total, with an increase of 0.10 (6 variables) for each variable was computed.

RESULTS

A total of 153 participants replied to the invitation, 50 surveys were excluded due to missing data; thus, we analyzed data from 103 participants.

Demographics of the participants

Table 1 summarizes the overall characteristics of the participants. Most participants were females with undergraduate or higher degrees. Approximately one-third of the participants had high levels of income. Each of the HCWs had a diverse social network (median, min.–max.) 8 (6–11).

Comparison of BIT and subscales of CIT by gender and age

Median, minimum-maximum, 25th, and 75th percentile values of the CIT and BIT, by gender and by age, are summarized in Tables 2 and 3, respectively. The CIT and BIT scores did not differ between genders (Table 2). Age groups were formed according to quartiles. The BIT demonstrated healthcare workers older than 38 years exhibited higher scores in thriving compared to those younger than 27 years (p=0.001). The domains of CIT, support, community, trust, respect, loneliness, engagement, learning, control, accomplishment, self-efficacy, and negative emotions did not differ by age group (Table 3). However, the domains of belonging (p=0.032), skills (p=0.006), self-worth (p=0.048), meaning and purpose (p<0.001), optimism (p=0.009), life satisfaction (p=0.012), and positive feelings (p=0.042) significantly differed between age groups (Table 3).

Table 1. General characteristics of the participants by gender

	Men (n = 33)		Women (n = 70)		p	X^2
Age (yr) (median) (min-max)	35 (18-47)		30.5 (23-57)		0.449	
	n	%	n	%		
Educational status					0.004	11.13
Elementary-high school	6	18.2	1	1.4		
Bachelor	13	39.4	42	60.0		
Graduate and over	14	42.4	27	38.6		
Marital status					0.002	0.977
Single	19	57.6	40	57.1		
Married	14	42.4	30	42.9		
Monthly income level					0.069	5.353
Low	16	48.5	31	44.3		
Medium	2	6.1	17	24.3		
High	15	45.5	22	31.4		
At least one medical disorder	8	24.2	19	27.1	0.755	0.098
	median (min-max)		median (min-max)		p	
Social network diversity	8 (6-11)		8 (6-11)		0.859	
Perceived social support	62 (12-82)		69 (23-84)		0.156	
BIT	3.7 (1.0-4.6)		3.6 (2.2-5.0)		0.879	

BIT: Brief inventory of thriving, Yr: years, min: minimum, max: maximum

Factors that affect thriving

In univariate analysis, the BIT and SND (r=.56, p<0.001) scores and the BIT and perceived social support (r=.53, p<0.001) scores were moderately and positively correlated (Table 4). Univariate analysis was also applied to explore the associations of the BIT with age, gender, education level, income level, marital status, SND, perceived social support, and status of having at least one medical disorder. The following factors had p

Table 2. CIT subscale scores ad BIT scores by gender

						Percentiles			p
	Gender	N	Median	Min.	Max.	25	50	75	
Support	Male	33	4.67	1.00	5.67	4.00	4.67	5.00	0.487
	Female	70	4.50	2.00	5.67	4.00	4.50	5.00	
Community	Male	33	3.67	1.00	5.00	3.00	3.67	4.00	0.051
	Female	70	4.00	2.00	5.00	3.33	4.00	4.33	
Trust	Male	33	3.00	1.00	4.33	2.50	3.00	3.33	0.784
	Female	70	3.00	1.00	5.00	2.33	3.00	3.33	
Respect	Male	33	3.67	1.00	4.67	3.00	3.67	4.00	0.179
	Female	70	4.00	1.00	5.00	3.58	4.00	4.00	
Loneliness	Male	33	3.67	1.33	5.00	3.33	3.67	4.33	0.615
	Female	70	4.00	1.33	5.00	3.00	4.00	4.33	
Belonging	Male	33	2.67	1.00	4.00	2.17	2.67	3.33	0.067
	Female	70	3.00	1.00	5.00	2.33	3.00	3.75	
Engagement	Male	33	3.67	1.00	5.00	3.00	3.67	4.00	0.314
	Female	70	4.00	1.67	5.00	3.33	4.00	4.33	
Skills	Male	33	3.67	1.00	5.00	3.33	3.67	4.33	0.409
	Female	70	3.67	1.00	5.00	3.00	3.67	4.00	
Learning	Male	33	4.00	1.00	5.00	3.33	4.00	4.67	0.966
	Female	70	4.00	2.33	5.00	3.67	4.00	4.33	
Control	Male	33	4.00	2.67	5.00	3.50	4.00	4.33	0.742
	Female	70	4.00	1.00	5.00	3.67	4.00	4.42	
Accomplishment	Male	33	3.33	1.00	5.00	2.50	3.33	4.00	0.589
	Female	70	3.33	2.00	5.00	3.00	3.33	4.00	
Self-efficacy	Male	33	4.00	1.00	5.00	3.50	4.00	4.33	0.415
	Female	70	4.00	3.00	5.00	3.67	4.00	4.67	
Self-worth	Male	33	4.00	1.00	5.00	3.33	4.00	4.67	0.423
	Female	70	4.00	1.33	5.00	4.00	4.00	4.67	
Meaning and purpose	Male	33	4.00	1.00	5.00	3.00	4.00	4.33	0.396
	Female	70	3.67	1.00	5.00	3.00	3.67	4.00	
Optimism	Male	33	4.00	1.00	5.00	3.33	4.00	4.33	0.114
	Female	70	3.67	1.00	5.00	2.67	3.67	4.00	
Life satisfaction	Male	33	3.67	1.00	5.00	3.00	3.67	4.00	0.450
	Female	70	3.33	1.00	5.00	2.67	3.33	4.00	
Positive emotions	Male	33	3.67	1.00	5.00	3.00	3.67	4.00	0.549
	Female	70	3.67	1.00	5.00	2.92	3.67	4.00	
Negative emotions	Male	33	3.33	1.00	5.00	2.67	3.33	4.00	0.974
	Female	70	3.33	1.00	5.00	2.33	3.33	4.00	
BIT	Male	33	3.70	1.00	4.60	3.30	3.70	3.90	0.879
	Female	70	3.60	2.20	5.00	3.20	3.60	4.00	

Min: minimum; max: maximum

Table 3. CIT subscale scores and BIT scores by age groups

	Age groups					Percentiles				
		N	Median	Min.	Max.	25	50	75	H	p
Support	≤27	28	4.00	1.00	5.00	3.33	4.00	4.92	7.568	0.056
	28-33	24	4.67	2.00	5.00	4.00	4.67	5.00		
	34-38	29	4.33	2.67	5.00	4.00	4.33	5.00		
	>38	22	5.00	1.67	5.00	4.25	5.00	5.00		
Community	≤27	28	3.83	1.00	5.00	3.08	3.83	4.33	6.557	0.087
	28-33	24	4.00	2.33	5.00	3.33	4.00	4.33		
	34-38	29	3.33	2.00	5.00	3.00	3.33	4.00		
	>38	22	4.00	2.33	5.00	3.58	4.00	4.33		
Trust	27	28	3.00	1.00	4.33	2.00	3.00	3.25	7.493	0.058
	28-33	24	3.00	1.00	5.00	2.67	3.00	3.33		
	34-38	29	2.67	1.67	4.33	2.33	2.67	3.33		
	>38	22	3.33	1.67	4.33	2.92	3.33	3.75		
Respect	≤27	28	4.00	1.00	4.67	3.33	4.00	4.00	0.402	0.940
	28-33	24	3.83	1.00	5.00	3.00	3.83	4.00		
	34-38	29	3.67	2.67	5.00	3.33	3.67	4.33		
	>38	22	3.67	3.00	5.00	3.58	3.67	4.00		
Loneliness	≤27	28	3.67	1.33	5.00	2.67	3.67	4.00	1.482	0.686
	28-33	24	4.00	1.33	5.00	3.00	4.00	4.33		
	34-38	29	3.67	1.33	5.00	3.17	3.67	4.33		
	>38	22	4.00	1.67	5.00	3.25	4.00	4.67		
Belonging	≤27	28	2.67	1.00	5.00	2.00	2.67	3.67	8.878	0.032
	28-33	24	3.00	1.00	4.33	2.33	3.00	3.58		
	34-38	29	3.00	1.00	4.67	1.83	3.00	3.33		
	>38	22	3.67	2.33	5.00	3.00	3.67	4.00		
Engagement	27	28	3.67	1.00	5.00	3.08	3.67	4.00	7.65	0.054
	28-33	24	4.00	3.00	5.00	3.33	4.00	4.33		
	34-38	29	4.00	1.67	5.00	3.00	4.00	4.33		
	>38	22	4.00	3.33	5.00	3.67	4.00	4.67		
Skills	≤27	28	3.33	1.00	4.67	2.67	3.33	4.00	12.43	0.006
	28-33	24	4.00	2.67	5.00	3.33	4.00	4.00		
	34-38	29	3.33	1.00	5.00	3.00	3.33	4.50		
	>38	22	4.00	3.00	5.00	3.67	4.00	4.67		
Learning	≤27	28	4.00	1.00	5.00	3.08	4.00	4.25	1.403	0.705
	28-33	24	4.00	2.67	5.00	3.67	4.00	4.33		
	34-38	29	4.00	2.33	5.00	3.33	4.00	4.67		
	>38	22	4.00	2.67	5.00	3.67	4.00	4.33		
Control	≤27	28	4.00	1.67	5.00	3.00	4.00	4.58	1.016	0.797
	28-33	24	4.17	1.00	5.00	3.42	4.17	4.67		
	34-38	29	4.00	2.00	5.00	3.67	4.00	4.50		
	>38	22	4.00	3.00	5.00	3.67	4.00	4.00		
Accomplishment	≤27	28	3.00	1.00	5.00	2.75	3.00	3.33	6.237	0.101
	28-33	24	3.33	2.00	5.00	3.00	3.33	4.00		
	34-38	29	3.33	2.00	5.00	2.50	3.33	4.00		
	>38	22	3.83	2.00	5.00	3.00	3.83	4.00		
Self-efficacy	≤27	28	4.00	1.00	5.00	3.42	4.00	4.33	2.434	0.487
	28-33	24	4.00	3.00	5.00	3.67	4.00	4.67		
	34-38	29	4.00	3.00	5.00	3.67	4.00	4.33		
	>38	22	4.00	2.67	5.00	3.67	4.00	4.75		

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Table 3. CIT subscale scores and BIT scores by age groups (Continue)

	Age groups					Percentiles				
		N	Median	Min.	Max.	25	50	75	H	p
Self-worth	≤27	28	4.00	1.00	5.00	3.08	4.00	4.00	7.901	0.048
	28-33	24	4.00	3.00	5.00	3.67	4.00	4.67		
	34-38	29	4.00	1.33	5.00	3.33	4.00	5.00		
	>38	22	4.00	3.67	5.00	4.00	4.00	4.67		
Meaning and purpose	≤27	28	3.00	1.00	4.67	2.33	3.00	3.33	21.61	<0.001
	28-33	24	4.00	2.00	5.00	3.08	4.00	4.25		
	34-38	29	3.67	1.00	5.00	2.83	3.67	4.50		
	>38	22	4.00	2.67	5.00	3.58	4.00	4.33		
Optimism	≤27	28	3.17	1.00	5.00	2.33	3.17	4.00	11.67	0.009
	28-33	24	3.83	2.00	5.00	3.00	3.83	4.25		
	34-38	29	3.33	2.00	5.00	2.67	3.33	4.33		
	>38	22	4.00	2.33	5.00	3.67	4.00	4.33		
Life satisfaction	≤27	28	2.67	1.00	5.00	2.08	2.67	3.67	11.04	0.012
	28-33	24	3.33	2.00	5.00	3.00	3.33	4.00		
	34-38	29	3.00	1.33	5.00	2.67	3.00	4.00		
	>38	22	3.83	2.00	5.00	3.00	3.83	4.00		
Positive emotions	≤27	28	3.00	1.00	5.00	2.33	3.00	4.00	8.215	0.042
	28-33	24	4.00	1.67	5.00	2.75	4.00	4.00		
	34-38	29	3.67	1.67	5.00	3.00	3.67	4.00		
	>38	22	4.00	2.00	5.00	3.33	4.00	4.00		
Negative emotions	≤27	28	3.00	1.00	5.00	2.00	3.00	4.00	6.767	0.08
	28-33	24	3.50	2.00	5.00	2.75	3.50	4.25		
	34-38	29	3.33	2.00	5.00	2.67	3.33	4.00		
		22	4.00	1.67	5.00	3.33	4.00	4.00		
BIT	≤27	28	3.25	1.00	4.60	2.85	3.25	3.68	6.024	<0.001
	28-33	24	3.65	2.80	4.90	3.40	3.65	4.00		
	34-38	29	3.70	2.20	4.90	3.30	3.70	3.90		
	>38	22	3.90	3.20	5.00	3.45	3.90	4.03		

levels of 0.25 or lower: income level, education level, marital status, age, social diversity, and perceived social support. These were further explored in the general linear model (GLM). Age, SND, and perceived social support are seen to significantly and positively influence thriving, once we adjust for the potential confounding variables of gender, marital status, education level, and income level. The explanatory power of the model was 46% (R2=0.46) (Table 5).

DISCUSSION

We analyzed the relationships between the thriving of HCWs, on the one hand, and SND and perceived social support, on the other. Our study was motivated by the limited eudaimonic views in the literature regarding evaluations of HCWs' well-being. We believe this gap needs to be filled in order to better promote HCWs' well-being. Our major findings were: i) SND and perceived social support positively influence thriving, ii) SND, perceived social support, and age account for 46% of the total effects on thriving, and iii) men and women did not differ in BIT scores or 18 of the subscale scores of the CIT, iv) Healthcare workers older than 38 years exhibited higher scores in BIT compared to those younger than 27 years.

The positive influence of SND on thriving aligns with a prior study's finding that adults with a diverse social network enjoy greater subjective well-being [18]. Depressive symptomatology is lower for older adults with diverse networks and higher for those with limited networks [19]. Regarding mechanisms, researchers have proposed linking diverse social networks with myelin integrity [5]

and greater amygdala volume [4]. The former mechanism may help explain why social networks impact so many different areas of health [5] and why greater amygdala volume translates to fewer psychiatric symptoms [20] and better social skills [21]. We could not locate any study on SND and thriving in HCWs in the literature. Therefore, we believe these findings will provide an avenue to inform the development of interventions aiming to promote the eudaimonic well-being of HCWs.

Table 4. Correlations between social network diversity perceived social support and thriving

	1	2	3.
1. Social network diversity	1		
2. Perceived social support	0.37**	1	
3. Brief inventory of thriving	0.56**	0.53**	1

**= Significant at 0.001 level (p < 0.001)

Table 5. General linear model for thriving

					95% CI	
	B	SE	t	p	Lower Bound	Upper Bound
Intercept	0.530	0.447	1,186	0.239	-0.357	1,418
Monthly income level						
Low	-0.006	0.147	-0.039	0.969	-0.297	0.286
Medium	0.054	0.152	0.356	0.722	-0.248	0.357
High	reference					
Education level						
Elementary-high	-0.320	0.207	-1.545	0.126	-0.731	0.091
Bachelor	0.147	0.129	1,140	0.257	-0.109	0.402
Graduate and higher	reference					
Marital status	-0.085	0.107	-0.799	0.426	-0.297	0.127
Age	0.026	0.008	3,287	0.001	0.010	0.042
Social network diversity	0.169	0.043	3,955	< 0.001	0.084	0.253
Perceived social support	0.013	0.003	4,278	< 0.001	0.007	0.018

CI: Confidence interval; Adjusted R^2 = 0.46

Perceived social support positively affecting well-being is corroborated by the literature [7, 22]. Supportive relationships are counted among the personal factors affecting HCWs' well-being [7]. The social support HCWs may receive from friends, significant others, and family within a diverse social network may provide them with the emotional strength that is often crucial to adapting to challenging working conditions, such as long working hours, on calls, and extended periods away from their families. These factors may play roles in accord with a main direct-effect model or a buffering model, i.e., by a process of support that protects people from potentially negative consequences of stressful circumstances [22].

From the sociodemographic factors, only age positively influenced BIT scores in HCWs. This finding differs from the original validation study, as it indicated that different age groups in the general population did not differ in BIT scores [9]. The reason for this finding may be that HCWs in their early careers, such as those in our study, learn new knowledge and gain experience while working tight schedules. This, in turn, may leave less time for self-awareness, recognizing one's qualities and abilities, actualizing oneself, and finding purpose and meaning in life, which are fundamental parts of thriving. As they grow older, a more stable work environment and other contextual factors may be secured and could contribute to thriving. Moreover, those older HCWs who stayed on the job longer may be the ones who are more resilient and have higher well-being [7].

No difference by age on CIT subscales - support, community, and engagement was in line however, differences found according to age in belonging, skills, self-worth, meaning and purpose, optimism, and positive emotions were not in line with the study by Su and colleagues. We found no differences by age in trust, respect, loneliness, control, learning, and negative feelings contrary to their study which demonstrated older people in the general population trusted others more, were respected by others, felt less lonely, perceived themselves as having more control over their lives and had fewer negative feelings, but also had less of a desire to learn new things. These discrepancies may reflect differences due to their community sample representing older adults than our study. Cultural differences may be another explanation as their sample was derived from the United States of America [9].Besides, Sorgente and colleagues explained the inconsistency between the CIT findings of some studies in the literature by alleging low validity and generalizability on the part of the CIT. They have drawn attention to the overlap between dimensions of the CIT. This overlap purportedly contradicts the confirmatory factor

analysis framework's theoretical assumptions, which state that each item should be explained by just one latent component [17].

We found no significant difference by gender in the CIT subscales and the BIT. Our findings on the BIT support the findings by Su and colleagues but are not consistent with their findings on the CIT subscales of Trust and Loneliness. They indicated that males are more likely than females to trust others and less likely to feel lonely [9]. These differences can be attributed to the fact that our sample is a homogeneous group consisting of HCWs with relatively diverse social networks, higher levels of education, and relatively higher incomes. Other studies that utilized the CIT and the BIT recruited participants with lower educations and moderate-income levels from the general population [9, 11, 17, 23] or university students [10]. However, the comparisons with the literature could not be made, as these validations [9-11, 17, 23] and review studies [17] do not explicitly examine the effects of income or educational level on well-being.

Our finding that thriving is unaffected by having at least one medical disorder is not in line with Su and colleagues' study. They indicated that individuals with a higher number of diseases reported considerably lower levels of psychological well-being on the majority of CIT subscales and the BIT, compared to those with few or no medical diseases [9]. This discrepancy might be due to their participants' older ages and higher numbers of medical illnesses, while our sample consisted of younger HCWs with very few medical diseases.

Recent literature on physician wellness, burnout, and resilience-focused heavily on COVID-19 [7]. A broader eudaimonic view of well-being with sufficient control-measured outcomes—not only in crisis times but in the longer term and consistently—will foster HCWs' well-being [7]. Given the vastly improved access to the internet and mobile phones, one implication of these findings could be the potential for low-cost web-based interventions which aim at SND and can be scaled up for greater use [24]. Another avenue for a further study could be investigating the organizational factors that affect HCWs' well-being, in contrast to the personal factors, so that the interventions in different contexts may have meaningful additional impacts [25].

Limitations and strengths: Our findings should be judged in light of some limitations. Firstly, this sample was composed of HCWs who had relatively high levels of well-being, favorable socioeconomic profiles, and relatively diverse social networks. They work in a similar work environment of a single hospital therefore the findings may not be representative of all HCWs, especially those who work in remote or frontline settings or those in otherwise challenging circumstances with little organizational support. Cross-sectional design hampered the possibility of inferences regarding causality. Exploring the quality of the work provided by the participants would have provided interesting insights. Despite these limitations, this study expands on prior research by providing insights into the eudaimonic well-being and social networks of HCWs, and allowing readers to better understand their connections.

Conclusion: Our findings imply that a diverse social network, social support from significant others, family, and friends, together with increasing age, account for nearly half of the total effects on thriving in HCWs. Males and females did not differ in domains of psychological functioning in the CIT—support, community, trust, respect, loneliness, belonging, engagement, skills, learning, control, accomplishment, self-efficacy, self-worth, meaning and purpose, optimism, life satisfaction, positive feelings, and negative feelings. HCWs receiving social support from friends, significant others, and family within a diverse social network may gain emotional strength, so that they may adapt to challenging conditions, long working hours, and time spent away from their families. By increasing the diversity of social networks and/or improving the quality and the functionality of social support, a significant and positive impact on HCWs' well-being may be achieved.

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