

# Stress and coping among consultant physicians working in Saudi Arabia

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**BACKGROUND:** Exposure to stressful working conditions without adequate stress-coping strategies may lead to stress and even psychiatric morbidity. There are a dearth of studies on stress-coping strategies among consultant physicians in the Arabian Gulf.

**OBJECTIVES:** Determine stress-coping strategies among consultants in Saudi Arabia and the relationship of strategies to level of stress.

**DESIGN:** Analytical cross-sectional study.

**SETTINGS:** Conducted between November 2014 and March 2015 among physician consultants registered at the Saudi Commission for Health Specialties.

**SUBJECTS AND METHODS:** Text messages were used to directly ask consultants to complete an online questionnaire.

**MAIN OUTCOME MEASURES:** The 28-item Brief COPE inventory and the Perceived Stress Scale.

**SAMPLE SIZE:** 582.

**RESULTS:** The consultants were largely males (71%) and Saudi (56%), and their mean age was 46.9 (7.9) years. Adaptive stress-coping strategies were more frequently used than maladaptive stress-coping strategies (68% versus 49%). Stress levels were positively correlated with maladaptive stress-coping strategies ( $r=0.41$ ,  $P<.001$ ) and negatively correlated with adaptive stress-coping strategies ( $r=-0.09$ ,  $P=.026$ ). Religion was the most frequently reported stress-coping strategy (79.6%) while alcohol drinking or substance use was the least frequently reported stress-coping strategy (28.0%). Females used both adaptive and maladaptive stress-coping strategies more than males ( $P=.002$  and  $P<.001$ , respectively). Stress management education/training was positively associated with frequent use of adaptive stress-coping strategies.

**CONCLUSIONS:** Physician consultants generally cope well with work stressors. Nevertheless, there is still a critical need for stress management programs targeting consultants in order to further improve coping strategies.

**LIMITATIONS:** The low response rate may negatively impact the validity and the generalizability of the current findings. The cross-sectional study design precluded the finding of any causal association.

**CONFLICT OF INTEREST:** None.

Consultants are senior physicians who have completed their training and are able to independently provide care for their patients, including complex cases.<sup>1</sup> In addition to leading teams delivering care for patients, they are also engaged in considerable supervisory, training, and managerial activities.<sup>1</sup> Healthcare providers, including consultants, have been shown to be at a higher risk of stress and its consequences than the general population.<sup>2,3</sup> Obviously, different work-related stressors faced by physician consultants over long years of service play an important role in the physician well-being and quality of work.<sup>4,5</sup> Stressful work environments may force the consultant to change hospitals or jobs or even quit the practice earlier than planned.<sup>6</sup> Additionally, chronic stress may lead to burnout or even psychiatric morbidity.<sup>2,7</sup>

Stressors in healthcare environments can manifest as perceived stress, and these stressors can exert negative personal and occupational impact only after failure of coping mechanisms to neutralize their effect.<sup>8</sup> Therefore, exposure to stressful working conditions without sufficient stress-coping strategies may lead to stress, burnout, anxiety, and depression.<sup>4,9</sup> Stress-coping strategies have been described differently in different studies: adaptive versus maladaptive;<sup>9-11</sup> problem-focused versus emotion-focused;<sup>11</sup> task-oriented versus emotion-oriented;<sup>8</sup> healthy versus non-effective/maladaptive;<sup>12</sup> good versus bad;<sup>13</sup> and positive versus negative stress-coping strategies.<sup>14</sup> Active coping, planning, and acceptance were among the frequently reported adaptive stress-coping strategies among physicians including consultants.<sup>9,11</sup> On the other hand, drug/alcohol use, self-distraction, and behavioral disengagement were among the most frequently reported maladaptive stress-coping strategies among most physicians, including consultants.<sup>9,11</sup> Interestingly, the ultimate impact of work-related stressors can be further modified by certain personality traits such as neuroticism, affectivity, openness, agreeableness, and conscientiousness.<sup>13,15,16</sup>

Although stress is well recognized problem among physicians of different ranks in Saudi Arabia,<sup>12,17,18</sup> stress-coping strategies have received little attention.<sup>12,19</sup> Actually, none of the local studies comprehensively examined stress-coping strategies among consultants. The objective of our study was to determine stress-coping strategies among physician consultants in Saudi Arabia and the relationships of strategies to stress levels and important personal and work-related characteristics.

## SUBJECTS AND METHODS

In this analytical cross-sectional study, all physician consultants registered with the Saudi Commission for

Health Specialties (SCFHS) Registry were invited to participate in the study. According to the SCFHS, which is the body responsible for setting health profession practice regulations in Saudi Arabia, a physician consultant must possess a Saudi specialty certificate (or equivalent) and have at least three years of experience in a specialty field at a recognized hospital or center.<sup>1</sup> Both Saudi and non-Saudi consultants from all medical specialties working in both public and private sectors of Saudi Arabia qualified for inclusion in the study. The SCFHS maintains a comprehensive record of all healthcare practitioners in Saudi Arabia.

In November 2014, there were 16000 physician consultants registered with the Saudi Commission of Health Specialty (SCFHS) in November 2014. Because there were no previous local studies that identified the proportion of stress or coping strategies among physician consultants, the estimation of the sample size was based on 50% proportion, which is known to be associated with the most liberal estimation of sample size. Therefore, the required sample size was 376 using a 95% confidence interval. Ethical approval for the study was obtained from the ethical review committee board at King Saud University, College of Medicine, Riyadh, Saudi Arabia. The SCFHS registry approved the use of third party data. Written informed consent was obtained from the participants.

During the data collection phase, only 11621 of the 16000 physician consultants who were registered with the SCFHS had cell phone numbers with or without an email address that were available in the SCFHS registry. Additionally, it was not clear how many of the 11621 cell phone numbers were still active. As a low response rate was expected based on rates from previous similar studies (25% residents despite using an updated email contact list),<sup>18</sup> we initially chose to randomly contact 2000 of the 11621 registered physician consultants to reach the desired sample size. After receiving only 100 responses out of the 2000 who were contacted, we decided to contact all of the 11621 consultants. Study invitations were sent via cell phone text messages to all of the target population between November 2014 and March 2015. Up to three reminder messages were sent. The messages explained the study objectives and directed the physician to a website to complete the study questionnaire. The English language was used in both the text messages and the study questionnaire. The first page of the website had an informed consent form, which offered the prospective participant the options of withdrawing with a provided reason or proceeding to the study questionnaire. We stopped accepting participants in March 2015. At that point, a total of 623 par-

ticipants started the internet-based questionnaire, but only 592 were able to complete the consent and questionnaire (5.1% response rate). Afterward, we excluded 10 participants as they were specialists (rather than consultants). Therefore, 582 consultants were eventually included in the current analysis.

A self-administered internet-based questionnaire was developed that included demographic characteristics including monthly family income and satisfaction with income; personal clinical history (chronic medical illnesses, psychiatric illnesses and sleep duration); job-related characteristics (job title and specialty); work-related and other stressors; ideations and education or training in stress management. One of the items of the study questionnaire was an open-ended question, asking participants to mention their most two helpful coping ways that makes them feel less stressed. One of the rationales of adding an open-ended question to quantitative survey is to free participants to convey their ideas in their own words.<sup>20</sup> We were interested in knowing which strategies were considered most helpful in making them feel less stressed and in correlating this with their actual level of perceived stress.

Stress-coping strategies used in the past month by examined consultants were evaluated using the 28-item Brief COPE inventory (Brief COPE).<sup>21</sup> Brief COPE is a reliable measure to test coping with indices generally exceeding 0.6021 and has been used previously in healthcare professionals' studies.<sup>22-26</sup> This scale assesses 14 stress-coping strategies using 28 questions (two questions for each strategy). Each question is answered using a 4-point Likert-type scale (not at all, a little bit, a medium amount, or a lot). Each question is given a score ranging from 1 to 4, and each strategy is given a score ranging from 2 to 8. Stress-coping strategies were clustered into adaptive or maladaptive strategies, as previously defined.<sup>10</sup> Adaptive stress-coping included several strategies: religion; active coping; planning; acceptance; positive reframing; instrumental support; emotional support; and humor. Maladaptive stress-coping included several strategies: behavioral disengagement; denial; self-distraction; self-blame; substance use; and venting. The BRIEF COPE score was calculated by summing individual question scores. As each question could have a maximum of four points, the maximum score of adaptive stress-coping is 64 points (16 questions covering eight strategies) and the maximum score of maladaptive stress-coping is 48 points (12 questions covering six strategies).<sup>21</sup>

The perception of stress over the past month was measured using the 10-question Perceived Stress Scale (PSS).<sup>27,28</sup> The PSS is a validated stress scale with proven

acceptable psychometric properties<sup>29,30</sup> and has been used in studies of healthcare professionals.<sup>31-34</sup> Each question was answered on a 5-point Likert-type scale (never, almost never, sometimes, fairly often, or very often) and was given a score (ranging from 0 to 4). The PSS score was calculated by summing individual question scores with higher scores corresponding to higher stress levels. As each question had a maximum of 4 points, the maximum PSS score was 40 points (10 questions).<sup>27,28</sup>

The study questionnaire content was validated by a multi-disciplinary committee that included specialists in medical ethics, psychiatry, family medicine, and epidemiology. The questionnaire was piloted with 20 physician consultants. After two weeks, the questionnaire was then re-administered to the same consultants with a >90% test-retest reliability. The overall PSS in addition to the adaptive and non-adaptive BRIEF COPE, had good internal consistency among their items as indicated by overall Cronbach alpha values of 0.844, 0.844, and 0.702.

Data were presented as frequencies and percentages for categorical data and mean and standard deviation (SD) for continuous data. The scores for coping strategies were analysed as continuous variables. Relative scores for coping strategies (adaptive and maladaptive) were calculated by transforming absolute scores (adaptive score of 64 maximum and maladaptive score of 48 maximum) to a 100-point scale (for easy interpretation). Because, there is no standard cut-off score to diagnose and/or grade stress,<sup>28</sup> PSS scores were categorized into three equal tertiles: lower tertile <15; middle tertile between 16 and 19; and upper tertile  $\geq 20$ . To examine the associations between the scores of coping strategies and categorical variables (such as tertiles of PSS and sociodemographic characteristics), a one-way analysis of variance (ANOVA) or *t* test (as applicable) were applied. To examine the associations between the scores of coping strategies and continuous variables (PSS), Spearman's correlation was used. To examine the different ways of stress coping by the level of stress, the chi-square test or Fisher exact test (as appropriate) were used. All *P* values were two-tailed, and a *P* value of <.05 was considered significant. IBM SPSS (Version 22.0. Armonk, NY: IBM Corp) was used for all statistical analyses.

## RESULTS

The 582 consultants who completed both the BRIEF COPE and the Perceived Stress Scale had a mean age of 46.9 (7.9) years and were mostly males ( $n=414$ , 71%). Fifty-six percent ( $n=326$ ) were Saudi, and 93% ( $n=540$ ) were married. **Table 1** shows responses to the 28 items

of the BRIEF COPE. Among the adaptive stress-coping strategies, the most frequently employed ones were finding comfort in religion or spiritual beliefs (54%), praying or meditating (42%), taking action to try to make the situation better (41%), and accepting reality (36%), while the least frequently employed ones were getting emotional support from other people (9%), getting help and advice from other people (11%), and making fun of the situation (11%). Among the maladaptive stress-coping strategies, self-distraction by, for instance, going to movies or watching TV (22%), turning to work or other activities to take my mind off things (17%), and/or criticizing oneself (16%) were the most often used maladaptive stress-coping strategies while using alcohol or other drugs for better feeling (1%) or getting through the situation (3%) were the least often used methods.

**Table 2** shows the scores of adaptive and maladaptive stress-coping strategies, with a maximum possible score of 8 for each strategy. The uppermost score was religion for adaptive stress-coping and self-distraction for maladaptive stress-coping. The average PSS was 17.65 (5.36), which is approximately 44% of the test maximum score of 40. **Table 3** shows the correlations between perceived stress levels and stress-coping strategies. Consultants with the lowermost stress level (lower tertile of PSS) generally had the uppermost adaptive stress-coping scores. This association was true for active coping ( $P < .001$ ), positive reframing ( $P < .044$ ), acceptance ( $P = .045$ ), and total adaptive stress-coping strategies ( $P = .048$ ). In addition, PSS had significant negative correlations with scores of active coping, acceptance, positive reframing, religion, and total adaptive stress-coping strategies. Also, consultants with the uppermost stress level (upper tertile of PSS) had the uppermost maladaptive stress-coping scores. PSS had significant positive correlations with maladaptive stress-coping scores. These correlations were significant for all individuals and for overall maladaptive stress-coping strategies ( $P$  values ranged between  $< .001$  and  $.008$ ).

**Table 4** showed the correlations between important characteristics and stress-coping strategies. Overall adaptive stress-coping strategies were common among females, those who were satisfied with income, and those who received education or training in stress management. Overall maladaptive stress-coping strategies were common among participants of younger age, females, Saudis, non-married, those who had psychiatric illness, and those who slept  $< 6$  hours per day. On the other hand, there were no associations between any stress-coping strategies and job title, specialty, and income.

In an open-ended question about "helpful coping ways that makes you feel less stressed" consultants gave a large variety of stress-coping ways/strategies (**Table 5**). The frequently used ones included religious activities such as prayer, reading the Holy Quran, making Umrah, and making supplications (31%) followed by having administrative support/improvements at work (14%), exercising (14%), taking vacation, especially short frequent ones (13%), socialization with family and friends (13%), and travel (12%). Interestingly, some of these stress-coping ways/strategies were significantly associated with lower stress levels such as religious activities ( $P = .004$ ) and sleeping ( $P = .011$ ) while others were significantly associated with higher stress levels such as traveling ( $P = .007$ ).

## DISCUSSION

Our study confirmed the more frequent use of adaptive compared with maladaptive stress-coping strategies (68% versus 49% of the time) among participants. Frequent use of adaptive stress-coping strategies have been previously reported among consultants in Saudi Arabia<sup>12</sup> and internationally<sup>9,11</sup> and may reflect the accumulated experience of adequate coping with work stressors. In support of this explanation, maladaptive stress-coping strategies in our study were negatively associated with the age of consultants. As previously reported,<sup>9,11</sup> all maladaptive stress-coping strategies in our study were significantly associated with (considerably) higher levels of stress while adaptive stress-coping strategies were significantly associated with (slightly) lower levels of stress. Interestingly, consultants in the present study had lower levels of stress than in another similar study among residents in Saudi Arabia (44% versus 55% of maximum PSS score).<sup>18</sup> Similarly, previous studies that included a wide range of physician ranks showed lower stress among senior compared to junior physicians.<sup>6,35</sup> The observed more frequent use of adaptive stress-coping strategies and its negative association with stress may explain the relatively moderate level of stress among our study participants.

To our knowledge, there is only one study that has used the Brief COPE among physicians.<sup>22</sup> We used Brief COPE because it has adequate psychometric properties, and it evaluates various coping strategies in an efficient way based on Lazarus and Folkman's model of coping along with behavioral self-regulation.<sup>21</sup> Other stress-coping tools used in international studies among consultants or other senior levels of physicians included the older 20-item Carver COPE instrument,<sup>9</sup> a 19-item German stress-coping inventory (SVF),<sup>14</sup> a 20-item Scottish coping questionnaire,<sup>4</sup> and a 48-item Parker

**Table 1.** The distribution of the responses to items of the 28-item Brief COPE inventory among medical consultants in Saudi Arabia (N=582).

		<b>Not at all</b>	<b>Little bit</b>	<b>Medium amount</b>	<b>A lot</b>
1	I've been turning to work or other activities to take my mind off things	96 (16.5)	191 (32.8)	197 (33.8)	98 (16.8)
2	I've been concentrating my efforts on doing something about the situation I'm in	36 (6.2)	154 (26.5)	200 (34.4)	192 (33.0)
3	I've been saying to myself "this isn't real"	304 (52.2)	168 (28.9)	79 (13.6)	31 (5.3)
4	I've been using alcohol or other drugs to make myself feel better	548 (94.2)	21 (3.6)	7 (1.2)	6 (1.0)
5	I've been getting emotional support from others	166 (28.5)	224 (38.5)	139 (23.9)	53 (9.1)
6	I've been giving up trying to deal with it	242 (41.6)	192 (33.0)	111 (19.1)	37 (6.4)
7	I've been taking action to try to make the situation better	24 (4.1)	106 (18.2)	216 (37.1)	236 (40.5)
8	I've been refusing to believe that it has happened	381 (65.5)	125 (21.5)	54 (9.3)	22 (3.8)
9	I've been saying things to let my unpleasant feelings escape	177 (30.4)	197 (33.8)	147 (25.3)	61 (10.5)
10	I've been getting help and advice from other people	116 (19.9)	228 (39.2)	173 (29.7)	65 (11.2)
11	I've been using alcohol or other drugs to help me get through it	537 (92.3)	21 (3.6)	8 (1.4)	16 (2.7)
12	I've been trying to see it in a different light, to make it seem more positive	49 (8.4)	163 (28.0)	256 (44.0)	114 (19.6)
13	I've been criticizing myself	94 (16.2)	231 (39.7)	165 (28.4)	92 (15.8)
14	I've been trying to come up with a strategy about what to do	24 (4.1)	122 (21.0)	247 (42.4)	189 (32.5)
15	I've been getting comfort and understanding from someone	70 (12.0)	222 (38.1)	219 (37.6)	71 (12.2)
16	I've been giving up the attempt to cope	288 (49.5)	179 (30.8)	85 (14.6)	30 (5.2)
17	I've been looking for something good in what is happening	40 (6.9)	173 (29.7)	245 (42.1)	124 (21.3)
18	I've been making jokes about it	151 (25.9)	193 (33.2)	168 (28.9)	70 (12.0)
19	I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping	70 (12.0)	175 (30.1)	211 (36.3)	126 (21.6)
20	I've been accepting the reality of the fact that it has happened	31 (5.3)	111 (19.1)	233 (40.0)	207 (35.6)
21	I've been expressing my negative feelings	89 (15.3)	247 (42.4)	180 (30.9)	66 (11.3)
22	I've been trying to find comfort in my religion or spiritual beliefs	33 (5.7)	81 (13.9)	155 (26.6)	313 (53.8)
23	I've been trying to get advice or help from other people about what to do	76 (13.1)	216 (37.1)	194 (33.3)	96 (16.5)
24	I've been learning to live with it	34 (5.8)	172 (29.6)	261 (44.8)	115 (19.8)
25	I've been thinking hard about what steps to take	33 (5.7)	110 (18.9)	257 (44.2)	182 (31.3)
26	I've been blaming myself for things that happened	145 (24.9)	242 (41.6)	141 (24.2)	54 (9.3)
27	I've been praying or meditating	44 (7.6)	109 (18.7)	183 (31.4)	246 (42.3)
28	I've been making fun of the situation	163 (28.0)	223 (38.3)	133 (22.9)	63 (10.8)

Data are number (percentage).

**Table 2.** Adaptive and maladaptive coping strategies of the 28-item Brief COPE inventory; mean values among consultant physicians in Saudi Arabia (N=582).

	Maximum possible points	Absolute score		Relative score (%)*	
		Mean	SD	Mean	SD
<b>Adaptive stress-coping strategies</b>	<b>64</b>	43.79	7.85	<b>68.4</b>	<b>12.3</b>
Religion (22 and 27)	8	6.37	1.69	79.6	21.2
Active coping (2 and 7)	8	6.08	1.52	76.0	19.0
Planning (14 and 25)	8	6.04	1.5	75.5	18.8
Acceptance (20 and 24)	8	5.84	1.45	73.1	18.1
Positive reframing (12 and 17)	8	5.53	1.47	69.1	18.4
Instrumental support (10 and 23)	8	4.85	1.65	60.7	20.6
Emotional support (5 and 15)	8	4.64	1.55	58.0	19.4
Humor (18 and 28)	8	4.43	1.8	55.4	22.5
<b>Maladaptive stress-coping strategies</b>	<b>48</b>	23.7	4.98	<b>48.9</b>	<b>10.4</b>
Self-distraction (1 and 19)	8	5.19	1.49	64.8	18.6
Self-blame (13 and 26)	8	4.62	1.64	57.7	20.5
Venting (9 and 21)	8	4.54	1.46	56.8	18.3
Behavioral disengagement (6 and 16)	8	3.66	1.52	45.7	19.0
Denial (3 and 8)	8	3.23	1.43	40.4	17.9
Substance use (4 and 11)	8	2.24	0.9	28.0	11.3
<b>Perceived stress scale</b>	<b>40</b>	17.65	5.36	<b>44.1</b>	<b>13.4</b>

\* Out of maximum possible score.

and Endler Coping Inventory for Stressful Situations (CISS).<sup>8,15</sup> Although we used a different instrument, our finding is consistent with existing studies on coping and stress among physicians.

Unlike in Western studies that included religion among the stress-coping strategies,<sup>4,11</sup> religion came on top of adaptive stress-coping strategies among our study participants. Religion was reported twice by the participants as the best used coping strategy, both in the Brief COPE as well as among the answers to open-ended question about the most helpful coping ways that makes participants feel less stressed. This finding was expected and was in agreement with other studies done in predominantly Muslim populations consisting of Iranian physicians,<sup>22</sup> residents in Saudi Arabia,<sup>19</sup> medical students in Malaysia,<sup>36</sup> dental students in Saudi Arabia,<sup>34</sup> and patients with anxiety and depression recruited from primary care centers in Pakistan.<sup>10</sup> In these

communities, religion is an important and unmasked factor affecting all aspects of life. Religious involvement has been shown to correlate with better overall psychological functioning and greater social support.<sup>37</sup> It has been suggested that religion can act as an emotional support against the stressor, help in positive re-interpretation of the problem, or be used as a tactic to cope with the stressor.<sup>38</sup> In addition to religion, active coping, planning, and acceptance were frequently reported as adaptive stress-coping strategies in our study and other studies done among consultants in Western countries<sup>9,11</sup> in addition to non-consultant studies in Saudi Arabia.<sup>19,34</sup>

Frequently employed maladaptive stress-coping strategies in the present study included self-distraction (such watching TV or doing other activities), self-blame/criticism, and venting. Similarly, self-distraction, self-blame, and venting have been also frequently reported

**Table 3.** Association and correlation between perceived stress levels and stress-coping strategies among medical consultants in Saudi Arabia (N=582).

	PSS score (mean (SD))				Correlation	
	Low ( $\leq 15$ )	Moderate (16-19)	High ( $\geq 20$ )	P value	Spearman's rho	P value
Adaptive stress-coping strategies	44.90 (8.37)	43.36 (7.35)	43.09 (7.68)	.048	-0.09	.026
Active coping (2 and 7)	6.43 (1.60)	6.10 (1.49)	5.73 (1.40)	<.001	-0.20	<.001
Instrumental support (10 and 23)	4.82 (1.61)	4.82 (1.61)	4.92 (1.73)	.765	0.03	.462
Planning (14 and 25)	6.19 (1.61)	5.95 (1.46)	5.98 (1.43)	.224	-0.06	.137
Acceptance (20 and 24)	6.00 (1.51)	5.89 (1.33)	5.64 (1.47)	.045	-0.11	.006
Emotional support (5 and 15)	4.71 (1.67)	4.51 (1.35)	4.68 (1.62)	.400	0.01	.760
Humor (18 and 28)	4.45 (1.85)	4.38 (1.64)	4.48 (1.90)	.858	0.01	.755
Positive reframing (12 and 17)	5.73 (1.53)	5.49 (1.39)	5.36 (1.48)	.044	-0.10	.018
Religion (22 and 27)	6.58 (1.57)	6.23 (1.80)	6.29 (1.69)	.095	-0.09	.030
Maladaptive stress-coping strategies	21.25 (4.66)	23.38 (4.56)	25.78 (4.65)	<.001	0.41	<.001
Behavioral disengagement (6 and 16)	3.11 (1.48)	3.65 (1.42)	4.20 (1.46)	<.001	0.34	<.001
Denial (3 and 8)	2.78 (1.13)	3.28 (1.39)	3.65 (1.60)	<.001	0.30	<.001
Self-distraction (1 and 19)	4.96 (1.51)	5.15 (1.50)	5.44 (1.42)	.006	0.15	<.001
Self-blame (13 and 26)	4.11 (1.54)	4.59 (1.51)	5.15 (1.70)	<.001	0.27	<.001
Substance use (4 and 11)	2.09 (0.52)	2.26 (0.95)	2.37 (1.11)	.008	0.14	.001
Venting (9 and 21)	4.20 (1.50)	4.45 (1.27)	4.97 (1.50)	<.001	0.23	<.001

PSS: perceived stress scale. Spearman's correlation used to examine the associations between scores of coping strategies and PSS.

as maladaptive stress-coping strategies among gastroenterologists in USA,<sup>11</sup> residents in Saudi Arabia,<sup>19</sup> physician assistant students in USA.<sup>23</sup> However, unlike in Western studies,<sup>4,9</sup> alcohol drinking or substance abuse were the least employed stress-coping strategy among our study participants. The same has been reported in other groups in Saudi Arabia<sup>19</sup> and may be explained by the fact that alcohol drinking is prohibited in Saudi Arabia and is regarded as a major sin in Islam. Additionally, as alcohol drinking is culturally and socially unacceptable behavior in Saudi Arabia, under-reporting cannot be excluded.

The present study showed a clear gender-difference in using stress-coping strategies with females significantly using more adaptive as well as maladaptive stress-coping strategies than males. Similarly, several

studies showed that female physicians were more likely to use both adaptive and maladaptive stress-coping strategies.<sup>11,19,22</sup> Nevertheless, higher stress in female physicians has been observed in the present study and previous studies.<sup>11,12,19</sup> This may be explained by the fact that the negative association observed in the present study between stress and maladaptive stress-coping strategies was much stronger than the positive association between stress and use of adaptive stress-coping strategies.

Maladaptive stress-coping strategies in the present study were significantly associated with psychiatric illness and shorter sleep duration. Similarly, previous studies among consultants showed that maladaptive stress-coping strategies such as isolation, alcohol drinking, denial, and disengagement can increase psy-

**Table 4.** Association between important characteristics and mean score for stress-coping strategies among medical consultants in Saudi Arabia (N=582).

Characteristics	Mean (SD) scores for stress-coping strategies		Characteristics	Scores of stress-coping strategies	
	Adaptive	Maladaptive		Adaptive	Maladaptive
<b>Age groups</b>			<b>Job title</b>		
<40	43.91 (8.05)	24.72 (4.86)	Associate consultant	41.47 (8.04)	21.33 (4.10)
40-49	43.69 (8.17)	23.31 (4.71)	Consultant	43.68 (7.86)	23.48 (4.94)
≥50	43.85 (7.39)	22.98 (5.25)	Senior consultant	45.71 (7.44)	24.06 (5.53)
P value	.959	.007	P value	.117	.179
<b>Gender</b>			<b>Specialty</b>		
Male	43.14 (7.72)	22.90 (4.96)	Internal Medicine	42.59 (7.95)	22.56 (5.02)
Female	45.38 (7.95)	24.87 (4.74)	Surgery	44.37 (7.35)	23.51 (4.46)
P value	.002	<.001	Pediatrics/ neonatology	43.85 (8.58)	24.13 (5.62)
<b>Nationality</b>			Obstetrics/ Gynecology	44.27 (7.35)	23.73 (4.68)
Saudi	43.64 (7.74)	23.91 (4.86)	Family Medicine	42.55 (7.28)	24.51 (4.83)
Non-Saudi	43.98 (7.99)	22.91 (5.08)	Anesthesiology	44.69 (8.12)	22.77 (5.47)
P value	.602	.015	Psychiatry	46.87 (7.57)	23.48 (4.64)
<b>Marital status</b>			Radiology	41.10 (8.58)	25.40 (5.35)
Not married	43.52 (8.07)	25.17 (4.39)	Laboratory	45.32 (8.31)	23.63 (5.12)
Married	43.81 (7.84)	23.34 (5.00)	Others	49.86 (3.49)	22.14 (4.38)
P value	.821	.022	P value	.050	.167
<b>Chronic medical illness</b>			<b>Monthly family income (SR)</b>		
No	43.94 (7.77)	23.35 (4.88)	<40000	44.36 (7.54)	23.57 (4.95)
Yes	42.94 (8.26)	24.16 (5.48)	40000-59000	43.88 (7.75)	23.61 (4.90)
P value	.267	.156	≥60000	42.35 (8.59)	22.94 (5.24)
<b>Psychiatric illness</b>			P value	.089	.482
No	43.78 (7.87)	23.31 (4.97)	<b>Satisfaction with income</b>		
Yes	43.87 (7.86)	26.26 (4.43)	Satisfied	44.46 (7.64)	23.53 (5.16)
P value	.952	.001	Not sure	42.12 (8.27)	23.48 (5.49)
<b>Sleep duration</b>			Dissatisfied	43.28 (7.94)	23.38 (4.51)
<6 hours	43.30 (6.98)	23.90 (5.02)	P value	.045	.945
6 hours	44.71 (8.18)	23.78 (5.20)	<b>Education or training in stress management</b>		
>6 hours	43.17 (8.18)	22.68 (4.60)	No	43.40 (7.99)	23.34 (5.04)
P value	.088	.033	Yes	45.27(7.11)	23.95 (4.74)
			P value	.019	.234

**Table 5:** Answers to open-ended questions about the most two helpful coping strategies that makes medical consultants in Saudi Arabia feel less stressed (N=464).

	Low (PSS ≤15)	Medium (PSS 16-19)	High (PSS ≥20)	Total	P value
Religious activities	66 (37.9)	48 (33.8)	33 (21.4)	147 (31.3)	.004
Administrative support/ improvements	19 (10.9)	22 (15.5)	25 (16.2)	66 (14.0)	.322
Exercise	28 (16.1)	17 (12.0)	19 (12.3)	64 (13.6)	.485
Vacation	20 (11.5)	20 (14.1)	23 (14.9)	63 (13.4)	.633
Socialization with family and friends	26 (14.9)	20 (14.1)	17 (11.0)	63 (13.4)	.562
Travel	11 (6.3)	18 (12.7)	27 (17.5)	56 (11.9)	.007
Watching TV, internet, reading, eating, or shopping	10 (5.7)	13 (9.2)	19 (12.3)	42 (8.9)	.112
Time off or alone	13 (7.5)	8 (5.6)	15 (9.7)	36 (7.7)	.412
Venting to colleagues or friends	13 (7.5)	7 (4.9)	15 (9.7)	35 (7.4)	.289
Reduce the amount of work	6 (3.4)	9 (6.3)	13 (8.4)	28 (6.0)	.158
Relaxation or meditation	14 (8.0)	8 (5.6)	6 (3.9)	28 (6.0)	.280
Accepting/understanding reality	10 (5.7)	10 (7.0)	6 (3.9)	26 (5.5)	.491
Increasing salary/income	7 (4.0)	9 (6.3)	6 (3.9)	22 (4.7)	.534
Sleeping	11 (6.3)	2 (1.4)	2 (1.3)	15 (3.2)	.011
Change/quit work	3 (1.7)	4 (2.8)	7 (4.5)	14 (3.0)	.362
Ignorance/avoidance	7 (4.0)	1 (0.7)	4 (2.6)	12 (2.6)	.182
Maintaining a positive attitude	4 (2.3)	2 (1.4)	3 (1.9)	9 (1.9)	.916
Medication or professional help	0 (0.0)	3 (2.1)	3 (1.9)	6 (1.3)	.120
Others	35 (20.1)	15 (10.6)	19 (12.3)	69 (14.7)	.035

Data are number (percentage). PSS: perceived stress scale.

chiatric morbidity, including anxiety and depression.<sup>4,9</sup> Moreover, chronic stress among physicians has been found to be associated with negative outcomes, such as chronic fatigue, substance abuse, psychiatric morbidity, and suicidal ideation.<sup>39-42</sup> Compared to the general population, physicians in the United States were more likely to die from cerebrovascular disease, accidents, and suicide.<sup>43</sup> On the other hand, in the open-ended question of our study, only 1% of the participants cited getting professional help as the most helpful coping ways that makes them feel less stressed. Key reasons for avoiding professional care especially psychological ones among physicians may included a belief they

could manage independently, time, confidentiality, license issues, and embarrassment.<sup>44,45</sup> However, systemic barriers to healthcare access (long hours and cultural issues) are more significant than individual barriers.<sup>46</sup> Additionally, the present data confirmed the positive association between receiving education or training in stress management and frequent use of adaptive stress-coping strategies. These findings further emphasize the critical need of stress management programs targeting consultants (especially females and those with younger age) in order to reduce the stress levels<sup>24</sup> and improve coping strategies.<sup>47</sup>

The present study is the first one in Saudi Arabia

to comprehensively examine stress- coping strategies among consultants using a relatively large sample size and well-validated stress and stress-coping tools among consultants recruited from diverse geographic regions. The main limitation of the present study was the low response rate, which may have negatively impacted the validity and the generalizability of the findings. The low response rate might be explained partially by the use of a relatively lengthy questionnaire. Moreover, previous studies have similarly shown very low response rates using text messaging.<sup>48</sup> Nevertheless, we relied on text messages in recruitment to provide busy consultants with the chance to conveniently respond to the invitation, to cover wide geographical locations, and to cut the cost of personal recruitment. Moreover, the cross-sectional study design precluded the finding of

any causal association and self-reported data may lead to reporting bias.

In conclusion, we confirmed the more frequent use of adaptive compared with maladaptive stress-coping strategies among a group of consultant physicians working in Saudi Arabia. Females used both adaptive and maladaptive stress-coping strategies more than males. Stress levels positively correlated with maladaptive stress-coping strategies and negatively correlated with adaptive stress-coping strategies. Religion was the most frequently reported stress-coping strategy, while alcohol drinking was the least frequently reported. Education/training in stress management was positively associated with frequent use of adaptive stress-coping strategies. Our findings emphasized the critical need of stress management programs targeting consultants.

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