



ORIGINAL ARTICLE

# Are physicians aging well? Subjective successful aging, happiness, optimism, and resilience in a sample of Brazilian aging doctors



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## KEYWORDS

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Subjective successful aging;  
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Optimism

## Abstract

**Background and objectives:** The elderly physician population is increasing worldwide. Data on how doctors have aged are scarce. The purpose of this study is to evaluate subjective successful aging (SSA) and its correlations with resilience, happiness, and optimism in a sample of older physicians.

**Methods:** A cross-sectional study was carried out with physicians over 65, through face-to-face interviews. All the volunteers answered the following: Self-rate successful aging; CD-RISC 10; Subjective Happiness Scale; LOT-R; SF-36; and a socio-demographic questionnaire.

**Results:** The mean of self-rate successful aging in SSA was 8.65 (92.3% over or equal to 7), and significant and positive correlations were found between resilience ( $r = 0.33$ ) and happiness ( $r = 0.68$ ). No correlation was found between age subset (young-old x old) or physical limitations and evaluation of SSA.

**Conclusion:** Physicians evaluated aging as successful regardless of health and limitations. SSA had a positive correlation with resilience and happiness.

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## Introduction

Living longer with less morbidity and high quality of life is a goal of both individuals and societies as a whole. Despite this, studies have demonstrated that the relation between living with chronic conditions or functional disability and the

perception of aging well is not linear. Aging can be a time for happiness and preserving one's well-being in spite of illness or age-related decline.<sup>1</sup>

Successful aging is a concept without universal standards and forms.<sup>2</sup> Subjective successful aging (SSA) is a model that emphasizes the self-perception of successful aging.<sup>3</sup> The aging process can be characterized as "successful" regardless of health, functional and cognitive capacity, and productive engagement. In contrast with traditional definitions

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of objective successful aging, predictors of SSA entail variables like subjective well-being and positive emotions, which can be influenced by aspects such as level of adaptation, expectations, and personality traits.<sup>4,5</sup>

The elderly physician population is increasing worldwide.<sup>6</sup> Data is scarce about how doctors are aging. There is not ample information on the health of aging physicians; whether they have physical limitations, maintain healthy life habits, are socially engaged, or if they have emotional health and are satisfied with life, despite aging. There is a growing body of research that has examined SSA with correlations in community-dwelling older adults, but to our knowledge, none has been conducted in aging physicians.

To elucidate how doctors have aged, this study investigates SSA, lifestyle, resilience, optimism, happiness, and quality of life in a sample of aging physicians in the city of Recife, Brazil.

## Methodology

### Participants

The older physicians registered in the Regional Council of Medicine received an email or phone call inviting them to participate in the study. Data were collected from July 2018 to December 2019. Inclusion criteria were: (1) aged 65 years or older; (2) physical and cognitive ability to participate in a face-to-face interview; (3) informed consent for study participation. Exclusion criteria were: diagnosis of dementia or undergoing dementia therapy.

### Measure

Face-to-face interviews were conducted individually with older physicians who volunteered to participate in the study. (1) The socio-demographic, health, and lifestyle variables were assessed using a questionnaire designed for this study. (2) Self-rated Successful Aging (SRSA): Participants were asked to rate their degree of successful aging from 1 to 10. Additionally, they were asked to indicate their agreement with the statement “I am aging well” (4 definitely true, 3 mostly true, 2 mostly false, 1 definitely false). The cut-point of  $\geq 7$  is considered to be a high level of SSA.<sup>7</sup>

(3) Health-related Quality of Life measure SF-36 (36-item short-form health survey): It assesses eight health concepts; physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health. The concept of “freedom from disability” is observed in question 3 of SF-36, with “no limitation” in the ability to lift or carry groceries, climb one flight of stairs, bend/kneel/stoop, and walk one block, or bathe/dress oneself.<sup>8,9</sup> (4) 10-item Connor-Davidson Resilience Scale (CD-RISC 10): This was used to assess the level of individual resilience. Greater scores reflect higher levels of resilience; scores from 0 to 26 are considered low, while scores from 37 to 40 are considered high.<sup>10,11</sup> (5) Subjective Happiness Scale (SHS): The median scores for the SHS ranged from 1 to 7 points, with a higher score indicating a greater level of subjective happiness. Scores above the median of 5.5 were classified as a good level of happiness.<sup>12,13</sup> (6) Revised Life

Orientation Test (LOT-R): Scores on the LOT-R range from 0 to 24, with higher scores indicating more optimism.<sup>14,15</sup>

### Ethical considerations

A signed consent form was obtained from each participant before data collection began. This study was approved by the institutional ethical committee.

### Data analysis procedure

SPSS version 23 was used for data analysis. Descriptive statistics (i.e. means and proportions) were used to examine the distributional properties of the data and to examine the characteristics of the sample.

The results of the categorical variables were presented in the form of absolute and percentage frequencies and the numerical variables (not categorized) were presented using these statistics: mean, standard deviation (mean (SD)), median, and 25th and 75th percentiles (median (P25; P75)). To assess the association between two numerical variables, Pearson's or Spearman's correlation coefficient and a specific t-Student test for the null correlation hypothesis was obtained. Either the t-Student or Mann-Whitney test was used to compare between categories of variables in numerical terms in the case of two categories. Pearson's chi-square test or Fisher's exact test was used to verifying the association between two numerical variables. The statistical significance level was set to 5%.

## Results

The study included 65 participants that responded to the invitation and were allowed to participate in the research. No participant in this sample was excluded from the study.

The mean age of the sample was 71.32 years. The majority of participants still carried out medical activities (90.8%). The sample demonstrated good rates of SSA. The mean self-rate of successful aging in SRSA was 8.65. A total of 92.3% scored over or equal to 7. A total of 63.1% answered true to the question “Am I aging well?”.

Table 1 shows comparative data between the group of young-old (age 65–74) and the group of old (age 75–84) physicians. There is a significant association between the age groups with each of the variables: gender, medical activity, satisfaction with sexual life, and without limitation, and significant difference in the variable physical functioning (SF36).

Regarding the SF-36 domains, the highest average corresponded to the mental health domain (95.26), and the lowest occurred in the general health status domain (69.98). The others ranged from 73.31 (vitality) to 85.13 (limitation of emotional aspects). A total of 38 physicians (58.5%) indicated some physical limitation (question 3 SF-36). Table 2 shows the variable comparison in the group of elderly physicians who had some form of physical limitation (question 3 SF-36, the ability to lift or carry groceries, climb one flight of stairs, bend/kneel/stoop, walk one block, or bathe/dress oneself) and those who had no physical limitation. Physical functioning and vitality (SF36) were the only variables with

**Table 1** Socio-demographic variables, health, lifestyle, SF-36, resilience, optimism, happiness, subjective successful aging (SSA) in young-old (age 65–74) and old (age 75–84) physician.

|                                    | Total sample<br>(N = 65) | Young-old<br>(age 65–74)<br>(N = 49) | Old<br>(age 75–84)<br>(N = 16) | p value               |
|------------------------------------|--------------------------|--------------------------------------|--------------------------------|-----------------------|
| <b>Demographic characteristics</b> |                          |                                      |                                |                       |
| Gender, N (%)                      |                          |                                      |                                |                       |
| Female                             | 22 (33.8)                | 20 (40.8)                            | 2 (12.5)                       | 0.038* <sup>(1)</sup> |
| Male                               | 43 (66.2)                | 29 (59.2)                            | 14 (87.5)                      |                       |
| Education                          |                          |                                      |                                |                       |
| Speciality                         | 46 (70.8)                | 33 (67.3)                            | 13 (81.2)                      | 0.357 <sup>(2)</sup>  |
| Md/PhD/postdoc                     | 19 (29.2)                | 16 (32.7)                            | 3 (19.8)                       |                       |
| Marital status                     |                          |                                      |                                |                       |
| Married/Had a partner              | 46 (70.8)                | 33 (67.3)                            | 13 (81.2)                      | 0.357 <sup>(2)</sup>  |
| Single/Divorced/Widowed            | 19 (29.2)                | 16 (32.7)                            | 3 (19.8)                       |                       |
| Living status                      |                          |                                      |                                |                       |
| Alone                              | 12 (18.5)                | 11 (22.4)                            | 1 (6.3)                        | 0.266 <sup>(2)</sup>  |
| Not alone                          | 53 (81.5)                | 38 (77.8)                            | 15 (93.7)                      |                       |
| Medicine activity                  |                          |                                      |                                |                       |
| Yes                                | 59 (90.8)                | 47 (95.9)                            | 12 (75.0)                      | 0.029* <sup>(2)</sup> |
| No                                 | 6 (9.2)                  | 2 (4.1)                              | 4 (25.0)                       |                       |
| <b>Health and lifestyle</b>        |                          |                                      |                                |                       |
| Physical activity                  |                          |                                      |                                |                       |
| Yes                                | 49 (75.4)                | 37 (75.5)                            | 12 (25.0)                      | 1.000 <sup>(2)</sup>  |
| No                                 | 16 (24.6)                | 12 (24.5)                            | 4 (25.0)                       |                       |
| Leisure activities                 |                          |                                      |                                |                       |
| Daily                              | 25 (38.5)                | 17 (34.7)                            | 8 (50.0)                       | 0.404 <sup>(1)</sup>  |
| Once a week or less                | 37 (56.9)                | 30 (61.2)                            | 7 (43.7)                       |                       |
| No                                 | 3 (4.6)                  | 2 (4.1)                              | 1 (6.3)                        |                       |
| Alcohol consumption                |                          |                                      |                                |                       |
| Low consumption                    | 28 (43.1)                | 22 (44.9)                            | 6 (37.5)                       | 0.604 <sup>(1)</sup>  |
| Medium/High consumption            | 37 (56.9)                | 27 (55.1)                            | 10 (62.5)                      |                       |
| Religious practice                 |                          |                                      |                                |                       |
| Yes                                | 45 (69.2)                | 35 (71.4)                            | 10 (62.5)                      | 0.059 <sup>(2)</sup>  |
| No                                 | 9 (13.8)                 | 4 (8.2)                              | 5 (31.3)                       |                       |
| Some spirituality                  | 11 (16.9)                | 10 (20.4)                            | 1 (6.3)                        |                       |
| Sleep                              |                          |                                      |                                |                       |
| Very good/good                     | 42 (80)                  | 37 (75.5)                            | 15 (93.7)                      | 0.159 <sup>(2)</sup>  |
| Bad/very bad                       | 13 (20)                  | 12 (24.5)                            | 1 (6.3)                        |                       |
| Satisfied with sexual life         |                          |                                      |                                |                       |
| Yes                                | 42 (64.6)                | 37 (75.5)                            | 5 (31.3)                       | 0.001* <sup>(1)</sup> |
| No                                 | 23 (35.4)                | 12 (24.5)                            | 11 (68.7)                      |                       |
| <b>Physical and mental health</b>  |                          |                                      |                                |                       |
| <b>SF-36</b>                       |                          |                                      |                                |                       |
| Physical functioning               |                          |                                      |                                |                       |
| Mean (SD)                          | 80.8 (15.5)              | 83.9 (13.4)                          | 71.6 (18.3)                    | 0.011* <sup>(3)</sup> |
| Median (P25;P75)                   | 85.0 (70.0; 92.5)        | 90.0 (75.0; 95.0)                    | 70.0 (65.0; 80.0)              |                       |
| Role-Physical                      |                          |                                      |                                |                       |
| Mean (SD)                          | 81.9 (31.1)              | 83.7 (29.1)                          | 76.6 (37.0)                    | 0.540 <sup>(3)</sup>  |
| Median (P25;P75)                   | 100.0 (75.0; 100.0)      | 100.0 (75.0; 100.0)                  | 100.0 (56.3; 100.0)            |                       |
| Pain                               |                          |                                      |                                |                       |
| Mean (SD)                          | 74.1 (19.6)              | 72.2 (19.9)                          | 79.9 (17.8)                    | 0.172 <sup>(3)</sup>  |
| Median (P25;P75)                   | 72.0 (61.0; 92.0)        | 72.0 (56.5; 84.0)                    | 79.0 (72.0; 100.0)             |                       |
| General health perception          |                          |                                      |                                |                       |
| Mean (SD)                          | 70.0 (17.2)              | 71.9 (17.5)                          | 64.2 (15.4)                    | 0.063 <sup>(3)</sup>  |
| Median (P25;P75)                   | 72.0 (61.0; 82.0)        | 72.0 (62.0; 86.0)                    | 67.0 (48.3; 77.0)              |                       |
| Vitality                           |                          |                                      |                                |                       |
| Mean (SD)                          | 73.3 (14.7)              | 73.4 (15.0)                          | 73.1 (14.4)                    | 0.852 <sup>(3)</sup>  |
| Median (P25;P75)                   | 75.0 (67.5; 85.0)        | 75.0 (65.0; 85.0)                    | 75.0 (66.3; 83.8)              |                       |

Table 1 (Continued)

|   | Total sample<br>(N = 65) | Young-old<br>(age 65–74)<br>(N = 49) | Old<br>(age 75–84)<br>(N = 16) | p value               |
|---|--------------------------|--------------------------------------|--------------------------------|-----------------------|
| <b>Social functioning</b>                       |                          |                                      |                                |                       |
| Mean (SD)                                       | 84.2 (20.2)              | 83.4 (21.7)                          | 86.7 (14.8)                    | 0.909 <sup>(3)</sup>  |
| Median (P25;P75)                                | 87.5 (75.0; 100.0)       | 87.5 (75.0; 100.0)                   | 87.5 (75.0; 100.0)             |                       |
| <b>Role-emotional</b>                           |                          |                                      |                                |                       |
| Mean (SD)                                       | 85.1 (28.9)              | 85.7 (28.9)                          | 83.3 (29.8)                    | 0.959 <sup>(3)</sup>  |
| Median (P25;P75)                                | 100.0 (83.3; 100.0)      | 100.0 (100.0; 100.0)                 | 100.0 (66.7; 100.0)            |                       |
| <b>Mental Health</b>                            |                          |                                      |                                |                       |
| Mean (SD)                                       | 83.3 (12.3)              | 82.8 (13.6)                          | 84.8 (7.5)                     | 0.758 <sup>(3)</sup>  |
| Median (P25;P75)                                | 84.0 (80.0; 92.0)        | 84.0 (80.0; 92.0)                    | 86.0 (77.0; 88.0)              |                       |
| <b>Mental Health</b>                            |                          |                                      |                                |                       |
| ≥ 73  | 56 (86.2)                | 40 (81.6)                            | 16 (100.0)                     | 0.069 <sup>(2)</sup>  |
| <73   | 9 (13.8)                 | 9 (18.4)                             | –                              |                       |
| <b>Limitation</b>                               |                          |                                      |                                |                       |
| Yes   | 38 (58.5)                | 25 (51.0)                            | 13 (81.2)                      | 0.033* <sup>(1)</sup> |
| No  | 27 (41.5)                | 24 (49.0)                            | 3 (18.8)                       |                       |
| <b>Positive Psychology</b>                      |                          |                                      |                                |                       |
| <b>Optimism</b>                                 |                          |                                      |                                |                       |
| Low (0–13)                                      | 13 (20)                  | 10 (20.4)                            | 3 (18.8)                       | 0.621 <sup>(1)</sup>  |
| Moderate (14–18)                                | 26 (40)                  | 18 (36.7)                            | 8 (50)                         |                       |
| High (19–24)                                    | 26 (40)                  | 21 (42.9)                            | 5 (31.3)                       |                       |
| <b>Resilience</b>                               |                          |                                      |                                |                       |
| Low (0–26)                                      | 14 (21.5)                | 12 (24.5)                            | 2 (12.5)                       | 0.363 <sup>(2)</sup>  |
| Moderate (27–36)                                | 44 (67.7)                | 33 (67.3)                            | 11 (68.8)                      |                       |
| High (37–40)                                    | 7 (10.8)                 | 4 (8.2)                              | 3 (18.8)                       |                       |
| <b>Happiness</b>                                |                          |                                      |                                |                       |
| ≥ 5.6   | 47 (72.3)                | 35 (71.4)                            | 12 (75)                        | 1.000 <sup>(2)</sup>  |
| < 5.6   | 18 (27.7)                | 14 (28.6)                            | 4 (25)                         |                       |
| <b>Successful aging</b>                         |                          |                                      |                                |                       |
| <b>Self-rated successful aging</b>              |                          |                                      |                                |                       |
| ≥ 7   | 60 (92.3)                | 45 (91.8)                            | 15 (93.8)                      | 1.000 <sup>(2)</sup>  |
| < 7   | 5 (7.7)                  | 4 (8.2)                              | 1 (6.3)                        |                       |
| <b>“Am I aging well?”</b>                       |                          |                                      |                                |                       |
| Definitely true                                 | 41 (63.1)                | 30 (61.2)                            | 11 (68.8)                      | 0.588 <sup>(1)</sup>  |
| Mostly true/ Mostly false/<br>Definitely false. | 24 (36.9)                | 19 (38.8)                            | 5 (31.3)                       |                       |

(<sup>1</sup>) Significant difference at the level of 5.0%.  
(<sup>1</sup>) Pearson.  
(<sup>2</sup>) Fisher.  
(<sup>3</sup>) Mann-Whitney.

a significant difference in the group of physicians with some physical limitations.

In correlations between positive mental health scales, significant and positive correlations were found between resilience (CD-RISC10) with happiness (SHS), as well as between happiness (SHS) with optimism (LOT-R). The highest correlation (0.68) occurred between the evaluation of SSA and happiness (Table 3).

## Discussion

This sample, composed of a group of Brazilian aging physicians, demonstrated a high rate of SSA. Despite this, the sample showed a significant rate of clinical disease or some physical limitation. Often, the proportion

of people who rate themselves as aging successfully is higher compared with stringent criteria of successful aging, such as the absence of disease and disability, and maintaining physical and mental functioning.<sup>16–20</sup> It indicates that the absence of disease and disability might not be the most important element in the concept of successful aging, and people with some age-related decline can also age successfully.

The favorable factors found in the sample may have contributed to the good levels of SSA. This group of physicians revealed as characteristics good levels of social bonds and engaging in healthy life habits. Most of them do not live alone, approximately two-thirds are married or live with a partner, the majority engage in physical activities, have religious activities, say they sleep well, and a little over half state they are satisfied with their sexual life.

**Table 2** Socio-demographic variables, health, lifestyle, SF-36, resilience, optimism, happiness, subjective successful aging (SSA) in the group of physicians with and without physical limitation.

|                                    | Total sample<br>(N = 65) | With limitation<br>(N = 38) | Without limitation<br>(N = 27) | p value                 |
|------------------------------------|--------------------------|-----------------------------|--------------------------------|-------------------------|
| <b>Socio-demographic variables</b> |                          |                             |                                |                         |
| Gender                             |                          |                             |                                |                         |
| Female                             | 22 (33.8)                | 12 (31.6)                   | 10(37)                         | 0.647 <sup>(1)</sup>    |
| Male                               | 43(66.2)                 | 26(68.4)                    | 17(63)                         |                         |
| Education                          |                          |                             |                                |                         |
| Medical specialty                  | 46(70.8)                 | 28(73.7)                    | 18(66.7)                       |                         |
| Md/PhD/postdoc                     | 19(29.2)                 | 10(26.3)                    | 9(33.3)                        |                         |
| Marital status                     |                          |                             |                                |                         |
| Married/had a partner              | 46(70.8)                 | 26(28.4)                    | 20(74.1)                       | 0.621 <sup>(1)</sup>    |
| Single/divorced/widowed            | 19(29.2)                 | 12(31.6)                    | 7(25.9)                        |                         |
| Living status                      |                          |                             |                                |                         |
| Alone                              | 12(18.5)                 | 8(21.1)                     | 4(14.8)                        | 0.747 <sup>(2)</sup>    |
| Not alone                          | 53(81.5)                 | 30(78.9)                    | 23(85.2)                       |                         |
| Medicine activity                  |                          |                             |                                |                         |
| Yes                                | 59(90.8)                 | 36(94.7)                    | 23(85.2)                       | 0.224 <sup>(2)</sup>    |
| No                                 | 6(9.2)                   | 2(5.3)                      | 4(14.8)                        |                         |
| <b>Health and lifestyle</b>        |                          |                             |                                |                         |
| Physical activity                  |                          |                             |                                |                         |
| Yes                                | 49(75.4)                 | 26(68.4)                    | 23(85.2)                       | 0.122 <sup>(1)</sup>    |
| No                                 | 16(24.6)                 | 12(31.6)                    | 4(14.8)                        |                         |
| Leisure activities                 |                          |                             |                                |                         |
| Daily                              | 25(38.5)                 | 12(31.6)                    | 13(48.1)                       | 0.440 <sup>(2)</sup>    |
| Once a week or less                | 37(56.9)                 | 24(63.2)                    | 13(48.1)                       |                         |
| No                                 | 3(4.6)                   | 2(5.3)                      | 1(3.7)                         |                         |
| Alcohol consumption                |                          |                             |                                |                         |
| Low consumption                    | 28(43.1)                 | 16(42.1)                    | 12(44.4)                       | 0.851 <sup>(1)</sup>    |
| Medium/high consumption            | 37(56.9)                 | 22(57.9)                    | 15(55.6)                       |                         |
| Religious practice                 |                          |                             |                                |                         |
| Yes                                | 45(69.2)                 | 28(73.7)                    | 17(63)                         | 0.594 <sup>(2)</sup>    |
| No                                 | 9(13.8)                  | 5(73.7)                     | 4(14.8)                        |                         |
| Some spirituality                  | 11(16.9)                 | 5(13.2)                     | 6(22.2)                        |                         |
| Sleep                              |                          |                             |                                |                         |
| Very good/good                     | 52(80)                   | 32(84.2)                    | 20(74.1)                       | 0.314 <sup>(1)</sup>    |
| Bad/very bad                       | 13(20)                   | 6(15.8)                     | 7(25.9)                        |                         |
| Satisfied with sexual life         |                          |                             |                                |                         |
| Yes                                | 42(64.6)                 | 21(55.3)                    | 21(77.8)                       | 0.061 <sup>(1)</sup>    |
| No                                 | 23(35.4)                 | 17(44.7)                    | 6(22.2)                        |                         |
| <b>Physical and mental health</b>  |                          |                             |                                |                         |
| <b>SF-36</b>                       |                          |                             |                                |                         |
| Physical functioning               |                          |                             |                                |                         |
| Mean (SD)                          | 80.8(15.5)               | 72.6 ± 14.6                 | 92.4 ± 7.4                     | < 0.001* <sup>(3)</sup> |
| Median (P25;P75)                   | 85.0 (70.0; 92.5)        | 75.0 (65.0; 85.0)           | 95.0 (90.0; 95.0)              |                         |
| Role Physical                      |                          |                             |                                |                         |
| Mean (SD)                          | 81.9 (31.1)              | 77.0 ± 34.1                 | 88.9 ± 25.3                    | 0.128 <sup>(3)</sup>    |
| Median (P25;P75)                   | 100.0 (75.0; 100,0)      | 72.0 (51.8; 84.0)           | 84.0 (72.0; 100.0)             |                         |
| Pain                               |                          |                             |                                |                         |
| Mean (SD)                          | 74.1 (19.6)              | 70,7 ± 19,8                 | 78.8 ± 18.5                    | 0.075 <sup>(3)</sup>    |
| Median (P25;P75)                   | 72.0 (61.0; 92.0)        | 72,0 (51.8; 84.0)           | 84.0 (72.0; 100.0)             |                         |
| General health perception          |                          |                             |                                |                         |
| Mean (SD)                          | 70.0 (17.2)              | 67.2 ± 17.3                 | 73.9 ± 16.7                    | 0.085 <sup>(3)</sup>    |
| Median (P25;P75)                   | 72.0 (61.0; 82.0)        | 67.0 (55.8; 82.0)           | 77.0 (67.0; 87.0)              |                         |
| Vitality                           |                          |                             |                                |                         |
| Mean (SD)                          | 73.3 (14.7)              | 69.2 ± 14.7                 | 79.1 ± 12.9                    | 0.008* <sup>(3)</sup>   |
| Median (P25;P75)                   | 75.0 (67.5; 85.0)        | 75.0 (60.0; 80.0)           | 80.0 (75.0; 85.0)              |                         |
| Social functioning                 |                          |                             |                                |                         |
| Mean (SD)                          | 84.2 (20.2)              | 81.4 ± 21.3                 | 88.4 ± 18.0                    | 0.077 <sup>(3)</sup>    |

| Table 2 (Continued)  | Total sample<br>(N = 65) | With limitation<br>(N = 38) | Without limitation<br>(N = 27) | p value              |
|--|--------------------------|-----------------------------|--------------------------------|----------------------|
| Median (P25;P75)   | 87.5 (75.0; 100.0)       | 87.5 (71.9; 100.0)          | 100.0 (75.0; 100.0)            |                      |
| Role emotional   |                          |                             |                                |                      |
| Mean (SD)  | 85.1 (28.9)              | 79.0 ± 34.2                 | 93.8 ± 16.1                    | 0.080 <sup>(3)</sup> |
| Median (P25;P75)   | 100.0 (83.3; 100.0)      | 100.0 (58.3; 100.0)         | 100.0 (100.0; 100.0)           |                      |
| Mental health  |                          |                             |                                |                      |
| ≥73  | 56 (86.2)                | 31 (81.6)                   | 25 (92.6)                      | 0.285 <sup>(2)</sup> |
| <73  | 9 (13.8)                 | 7 (18.4)                    | 2 (7.4)                        |                      |
| <b>Positive Psychology</b>   |                          |                             |                                |                      |
| Optimism   |                          |                             |                                |                      |
| Low (0–13)   | 13 (20)                  | 8 (21.1)                    | 5 (18.5)                       | 0.827 <sup>(1)</sup> |
| Moderate (14–18)   | 26 (40)                  | 14(36.8)                    | 12(44.4)                       |                      |
| High (19–24)   | 26(40)                   | 16(42.1)                    | 10(37)                         |                      |
| Resilience   |                          |                             |                                |                      |
| Low (0–26)   | 14(21.5)                 | 10(26.3)                    | 4(14.8)                        | 0.537 <sup>(2)</sup> |
| Moderate (27–36)   | 44(67.7)                 | 24(63.2)                    | 20(74.1)                       |                      |
| High (37–40)   | 7(10.8)                  | 4(10.5)                     | 3(11.1)                        |                      |
| Happiness  |                          |                             |                                |                      |
| ≥5.6   | 47(72.3)                 | 28(73.7)                    | 19(70.4)                       | 0.769 <sup>(1)</sup> |
| <5.6   | 18(27.7)                 | 10(26.3)                    | 8(29.6)                        |                      |
| <b>Successful aging</b>  |                          |                             |                                |                      |
| Self-rated successful aging  |                          |                             |                                |                      |
| ≥7   | 60 (92.3)                | 55 (92.1)                   | 25 (92.6)                      | 1.000 <sup>(2)</sup> |
| <7   | 5 (7.7)                  | 3 (7.9)                     | 2 (7.4)                        |                      |
| “Am I aging well?”   |                          |                             |                                |                      |
| Definitely true  | 41 (63.1)                | 22 (57.9)                   | 19 (70.4)                      | 0.304 <sup>(1)</sup> |
| Mostly true/ Mostly false/<br>Definitely false.  | 24 (36.9)                | 16 (42.1)                   | 8 (29.6)                       |                      |
| <sup>(*)</sup> Significant difference at the level of 5.0%.<br><sup>(1)</sup> Pearson.<br><sup>(2)</sup> Fisher.<br><sup>(3)</sup> Mann-Whitney. |                          |                             |                                |                      |

Most of the sample still carried out medical activities. Physicians are usually socially engaged, have a social reputation, and practice medicine with engagement and a sense of purpose, all of which may contribute to the well-being and mental health.<sup>21,22</sup>

Being in the older age bracket does not seem to influence experiencing SSA. When comparing the variables between the younger elderly (65–74 years) and the older age group (75–84 years), we did not find a significant difference in the scores for SSA, resilience, optimism, and happiness. The presence of more males in the older age group was found to be a significant difference, as well as a higher rate of retired physicians, dissatisfaction with their sexual life, worse physical functioning, and more limitations.

When comparing the group of elderly physicians who showed physical limitations with those who had no physical limitations, no differences were seen in the socio-demographic variables, lifestyle, positive psychology, and physical functioning. These findings strengthen the idea that the perception of aging well and well-being does not depend on one's physical condition or decline that may be related to aging.

The sample showed moderate levels of resilience. The level of resilience of the elderly physicians in our sample did

not show significant differences in the group of older physicians or in those who showed physical limitations. Being resilient can have a great impact on how one copes with limitations and declines related to aging, which may favor better adaptation and better SSA. A mean of 29.66 points in CD-RISC 10 was found. Compared with other publications on the elderly, an article on war veterans, the average age of 71 years, found mean resilience similar to ours of 30.3 points in CD-RISC 10.<sup>23</sup> In another study using CD-RISC 10 on the elderly in a community-dwelling, aged between 50 and 99 years, the mean resilience scores varied between 30.8 and 32.1, depending on the age bracket, with means slightly higher than those found in our group of elderly physicians.<sup>24</sup>

When confronted by the diverse stressful situations of medical practice, resilience is vastly important in the physician's life in preventing mental illness. Some observational studies have been conducted to evaluate resilience among physicians, especially when related to burnout, as well as to other constructs of positive psychology such as well-being, quality of life, empathy, positive mental health, and personality traits of the medical population.<sup>25–27</sup>

The majority of our sample showed good levels of happiness. Some authors differentiate between two types of happiness: psychological well-being or eudaemonia (referring to



**Table 3** Correlations between positive mental health scales (CD-RISC 10, LOT-R, SHS).

| CD-RISC10 | LOT-R                        | SHS                          | Aging                          |
|-----------|------------------------------|------------------------------|--------------------------------|
| CD-RISC10 |                              |                              |                                |
| LOT-R     | 0.19 (1.121) <sup>(1)</sup>  |                              |                                |
| SHR       | 0.33 (0.007)* <sup>(1)</sup> | 0.28 (0.023)* <sup>(1)</sup> |                                |
| Aging     | 0.33 (0.008)* <sup>(1)</sup> | 0.25 (0.101) <sup>(1)</sup>  | 0.68 (< 0.001)* <sup>(1)</sup> |

<sup>(\*)</sup> Significant difference at level of 5.0%

<sup>(1)</sup> Spearman's correlation

CD-RISC 10 - 10-item Connor-Davidson Resilience Scale;

LOT-R - Revised Life Orientation Test;

SHS - Global subjective happiness;

Aging - Self-rated Successful Aging (SRSA).

personal fulfillment and realizing individual potential as a character development process) and hedonic well-being (linked to what brings pleasure and experiencing satisfaction).<sup>28,29</sup> Even though one might think the elderly, due to a series of stressors, would have lower levels of happiness, evidence shows that there is only a small, or no, variation of happiness as one age.<sup>30</sup>

Another favorable factor found in this sample was the rate of optimism. 80% of the sample showed high or moderate rates of optimism. Optimism can be considered as an individual variable that reflects how many favorable expectations each person has regarding the future and a tendency to expect good things to happen in their lives.<sup>31,32</sup> This simple difference between expecting good things versus expecting bad things has a fundamental influence on the individual's behavior, their outlook on life, and even on the way they face adversity and aging.

In the correlation assessment among the rates of correlation between resilience, happiness, optimism, and SSA, the highest correlation was between happiness with higher scores of SSA, which might suggest that happier physicians tend to better assess their aging. This result agrees with the current trend that any measure to assess aging must reflect a feeling of individual well-being way beyond the simple absence of illness or disability.

Positive correlations were also found between resilience and happiness and resilience and the aging assessment scale, suggesting the possibility that more resilient physicians tend to be happier and score higher on their aging assessment; however, by being a transversal study, the relations may be inverted: happier physicians become more resilient and physicians who score higher on their aging assessment become more able to cope with stressors, many times due to aging itself. In this regard, some studies have also shown the correlation between resilience and a more positive assessment of their aging,<sup>7,24,33</sup> as well as a positive correlation between resilience and a higher degree of agreement on successful aging.

Regarding optimism, there was a positive correlation between higher scores of optimism and higher degrees of happiness, but there was no correlation between higher levels of optimism and greater resilience; contrary to what some studies that assess a strong correlation between these two variables suggest (whoever has a more positive outlook on life can better cope with adversities).<sup>33</sup> It appears that in

our population, resilience, along with higher levels of well-being, was more important in the assessment of successful aging, and occurred regardless of the level of optimism. In this respect, due to being transversal, our study does not allow a more precise assessment of the cause and effect relation, as in longitudinal studies, but we may presume that a physician's greater resilience does play a role, regardless of optimism.

This study has strong points. It was a pioneer in obtaining information on aging from the medical population in Brazil. Having face-to-face interviews was a favorable factor of the study, as this model promotes a more engaged sample in providing information, especially in an older public that might have limitations in answering questionnaires, which would then make the administration of the same more difficult. Besides, due to cultural aspects, answering a questionnaire by phone or email does not render good adherence from the public in our location.

This study has some limitations. Despite the great body of literature on successful aging, we have little data on subjective and multidimensional measurements. Thus, it is important to point out that the Self-rated successful aging proposed by Monstross et al. (2006)<sup>34</sup> is not a validated instrument. In contrast, it is largely used to measure subjective successful aging. The reduced number of participants and local characteristics may limit the universal scope of these findings. Few elderly physicians who are registered in the Regional Medical Board were found and allocated, partly because of the Board's database not being updated, but also due to the physicians' disinterest in participating in the study. Our sample was mainly composed of physicians who were still working, and because of this, they might have been more available to participate in the study, possibly resulting in a selection bias. Thus, we should be cautious in extrapolating the SSA indices found in our study to the physicians who are no longer active in medical practice, or who have more pronounced physical or emotional limitations that would prevent them from being active.

In summary, we believe this is an area of study that can bring relevant information about which factors are related to successful aging in the medical population so that future studies will evaluate this issue more broadly and with larger sample sizes. Thus, such knowledge may be the base for paradigm changes, and possibly, interventions to be carried out in this group of aging physicians.

## Ethical considerations

This study was approved by the institutional ethical committee of the Federal University of Pernambuco. A signed consent form was obtained from each participant before data collection began.

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## Declaration of Competing Interest

The authors have no conflict of interest to declare.

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