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Associação entre Religiosidade, Espiritualidade, Qualidade de vida e o Sistema Nervoso Autônomo de Pacientes com Doenças Pulmonares.

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“Só se vê bem com o coração, o essencial é invisível aos olhos”.

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RESUMO

INTRODUÇÃO: Evidências científicas demonstram que a religiosidade e a espiritualidade (R/E) têm grande influencia sobre a saúde física e mental dos indivíduos. A maioria dos estudos apontam para melhor qualidade de vida, maior sobrevida, melhor saúde mental e menor incidência de doenças em geral. As doenças pulmonares comprometem de forma significativa a qualidade de vida dos pacientes, não tem cura, e em fase avançada tem indicação de transplante pulmonar. Pacientes com doenças pulmonares apresentam desequilibro autonômico, o que representa maior risco cardiovascular e de morte. Neste sentido, os objetivos deste estudo são: conhecer a R/E dos pacientes, comparar a R/E dos pacientes que aguardam em lista de transplantes com aqueles que não estão em lista, verificar se a R/E estão associadas com parâmetros clínicos e com a qualidade de vida dos pacientes. Avaliar o sistema nervoso autônomo dos pacientes com doença pulmonar intersticial e investigar se existe associação da R/E com a modulação simpática e parassimpática dos pacientes. **MÉTODOS:** Trata-se de um estudo observacional transversal. Os pacientes com doenças pulmonares, inscritos no programa de reabilitação pulmonar foram avaliados na primeira semana de reabilitação. Coletamos os dados clínicos, qualidade de vida, R/E e o balanço simpatovagal coletado através do registro de um eletrocardiograma (ECG). **RESULTADOS:** Encontramos alta R/E, maior fé e espiritualidade total no grupo que aguarda em lista para o transplante de pulmão. Associação positiva entre a R/E com “aspectos físicos, saúde mental e aspectos emocionais”, domínios da qualidade de vida do questionário SF-36. Os pacientes com doença pulmonar intersticial (DPI) apresentam desequilíbrio simpatovagal e maior modulação do sistema nervoso simpático. A modulação simpática foi correlacionada positivamente com a capacidade vital forçada (CVF-L) da espirometria e com os aspectos sociais e emocionais da qualidade de vida. Além disso, o simpático (LFa) estava diretamente correlacionado com a paz. No grupo de pacientes com DPI, também encontramos correlação positiva entre a R/E com os domínios da qualidade de vida. **CONCLUSÃO:** Os pacientes com doenças pulmonares que participam de um programa de reabilitação pulmonar apresentam alta R/E, que se associou diretamente com a qualidade de vida.

Além disso, os pacientes com doença intersticial apresentaram maior modulação do sistema nervoso simpático, que possivelmente permitiu melhor respiração. Da mesma forma, o simpático se relacionou com melhor qualidade de vida e maior sensação de paz.

Palavras chaves: Doenças pulmonares, doenças pulmonares intersticiais, Doença pulmonar obstrutiva crônica, transplante de pulmão, religiosidade, espiritualidade, sistema nervoso autônomo, balanço simpatovagal.

ABSTRACT

INTRODUCTION: Scientific evidences show that religiosity and spirituality (R/S) have a great influence on the physical and mental health of individuals. Most studies point to a better quality of life, greater survival, better mental health and lower incidence of diseases in general. The lung diseases significantly compromise patients' quality of life, there is no cure, and in the advanced stage has an indication for lung transplantation. Patients with pulmonary diseases have autonomic imbalance, which represents a higher cardiovascular and of death risk. In this sense, the objectives of this study are: to know the R/S of the patients, compare the R/S of the patients waiting in the list of transplants with those who are not in the list, verify if the R/S are associated with clinical parameters and with the quality of life of the patients. Evaluate the autonomic nervous system of patients with interstitial lung disease and investigate if there is an association of the R/S with the sympathetic and parasympathetic modulation of the patients. **METHODS**: This is a cross-sectional observational study. The patients with lung diseases enrolled in the pulmonary rehabilitation program were evaluated in the first week of rehabilitation. We collected the clinical data, quality of life, R/S and the sympathovagal balance were collected collected through the recording of an electrocardiogram (ECG). **RESULTS**: We found high R/S, greater faith and total spirituality in the waiting group for lung transplantation. A positive association between R/S with "physical aspects, mental health and emotional aspects", domains of quality of life of the SF-36 questionnaire. Patients with interstitial lung disease (ILD) have sympathovagal imbalance and increased modulation of the sympathetic nervous system. The sympathetic modulation was positively correlated with the forced vital capacity (FVC-L) of spirometry, with the social and emotional aspects of quality of life. In addition, the sympathetic (LFa) was directly correlated with peace. In the group of patients with ILD, we also found a positive correlation between R/S and quality of life domains. **CONCLUSION**: The patients with pulmonary diseases who participate in a pulmonary rehabilitation program showed high R/S, which were directly associated with quality of life. In addition, the patients with interstitial disease presented greater modulation of the sympathetic nervous

system, which allowed better respiration. Likewise, the sympathetic was related with better quality of life and a greater sense of peace.

Keywords: Lung diseases, interstitial lung diseases, Chronic Obstructive Pulmonary Disease, lung transplantation, religiosity, spirituality, autonomic nervous system, sympathovagal balance.

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LISTA DE ABREVIATURAS

R/E	Religiosidade e Espiritualidade
NHIS	National Health Interview Survey
JAMA	Journal of the American Medical Association
DPOC	Doença Pulmonar Obstrutiva Crônica
DPI´s	Doenças Pulmonares Intersticiais
SNA	Sistema Nervoso Autônomo
VFC	Variabilidade da Frequência Cardíaca
R-R	Intervalo RR é a distância entre duas ondas R sucessivas
IAM	Infarto Agudo do Miocárdio
HF	High Frequency – Alta Frequência
LF	Low Frequency – Baixa Frequência
LF/HF	Balanço simpato-vagal ou balanço autonômico
Nu	Unidades normalizadas (%)
m/s^2	Unidades absolutas (a)

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Capítulo I – Revisão da Literatura

1.1. Religião, Religiosidade e Espiritualidade.

Nas últimas décadas, têm crescido de forma expressiva, o número de pesquisas científicas abordando as crenças religiosas e espirituais dos pacientes e a sua influência na saúde mental e física, despertando o interesse de diversos profissionais e pesquisadores, principalmente na área da saúde [1-3]. A consolidação e o crescimento neste campo de pesquisa foi evidenciado por Lucchetti e Lucchetti (2014) em estudo bibliométrico, realizado no PubMed no período de 1999-2013, onde encontraram 30.532 referências sobre "espiritualidade, religião e saúde" [4].

Apesar de não haver uma definição consensual, koenig e colaboradores definem religião como um “sistema organizado de crenças, práticas, rituais e símbolos designados para facilitar o acesso ao sagrado, ao transcendente (Deus, força superior, verdade última.)”; religiosidade como “o quanto um indivíduo acredita, segue e pratica uma religião, podendo ser organizacional (participação na igreja ou templo religioso) ou não organizacional (rezar, ler livros, assistir programas religiosos na televisão)” e espiritualidade como “uma busca pessoal para compreender as questões relacionadas ao fim da vida”, ao seu sentido, sobre as relações com o sagrado ou transcendente que, podem ou não, levar ao desenvolvimento de práticas ou formações de comunidades religiosas [1]. Ou Seja, a “relação do ser humano com o transcendente, com aspectos não materiais, não físicos da existência, tais como deuses, espíritos ou realidade última”[5].

A Associação Mundial de Psiquiatria juntamente com a Organização Mundial da Saúde publicaram em 2016, um posicionamento sobre a religião e a

espiritualidade na psiquiatria. Dentro dos transtornos mentais, os estudos têm demonstrado que a Religiosidade e a Espiritualidade (R/E) têm implicações significativas na prevalência das doenças; como nos distúrbios depressivos e uso de substancias; no diagnóstico para diferenciar experiências espirituais e transtornos mentais, no tratamento, nos resultados (suicídio), na prevenção, assim como na qualidade de vida e no bem estar dos indivíduos. O documento enfatiza a importância da abordagem da R/E pelo psiquiatra na investigação e na prática clínica [6], principalmente quando as crenças estão presente na vida do indivíduos. Dados de estudos epidemiológicos têm demonstrado que o envolvimento religioso está associado a melhores resultados de saúde na população. Dessa forma, seria apropriado que os demais profissionais da área da saúde tivessem conhecimento sobre o tema, e quem sabe possam incluir essa abordagem em seus atendimentos e práticas.

Koenig (2012), em uma extensa revisão da literatura, encontrou associação positiva da R/E com a função imunológica, com a qualidade de vida e com as emoções: esperança, otimismo e propósito/significado [7]. Além disso, pesquisas recentes apontam para uma associação inversa da R/E com menores quantidades plasmáticas de marcadores inflamatórios, como a proteína C reativa. A literatura aponta ainda para uma redução do estresse, observada pela diminuição de cortisol [8-10] quando a R/E está presente na vida do paciente.

Apesar das diferenças culturais, em relação à saúde mental, estudos brasileiros têm mostrado resultados semelhantes aos internacionais[11]. Lucchetti e colaboradores (2014) [12] verificaram que pessoas mais religiosas são mais restritivas ao álcool. Da mesma forma, Lucchetti e colaboradores

(2012), estudando a associação entre comparecimento religioso, autorrelato de religiosidade, depressão, e fatores de saúde em 170 idosos de um ambulatório, constataram que quanto maior a religiosidade autorrelatada, menor a prevalência do hábito de fumar, de sintomas depressivos e de hospitalização. Além disso, quanto maior a frequência religiosa menor os sintomas depressivos [13].

Em geral, os estudos mostram que indivíduos com maior R/E apresentam menor prevalência de depressão, ansiedade, suicídio [11, 14-17], menores índices de doenças cardiovasculares, menor pressão arterial diastólica [18, 19] e menor mortalidade geral [20-22].

Apesar da maioria dos estudos apontarem que a religiosidade está associada positivamente com saúde, alguns estudos demonstraram seus aspectos negativos. Koening et al. (2001), em um estudo de coorte, verificaram que aqueles que possuíam dúvidas e conflitos religiosos apresentaram maior mortalidade. Da mesma forma, Sherman et al. identificaram que o conflito religioso foi preditor de maiores taxas de depressão, estresse, fadiga e dor. Os aspectos negativos envolvem alguns sentimentos como: descontentamento espiritual, pensamento de que Deus está punindo e questionamento dos poderes de Deus.

1.2. Religiosidade, Espiritualidade e Mortalidade

Em 2000, McCullough publicou uma metanálise com 42 estudos independentes [23], avaliando cerca de 125 mil participantes encontrou menor

mortalidade em pessoas que possuíam maior frequência de práticas religiosas, resultado esse em acordo com outra metanálise recente [22].

Na mesma linha, Hummer e colaboradores (1999) avaliaram dados do *National Health Interview Survey* (NHIS), com mais de 21 mil pessoas, verificaram que indivíduos que nunca tiveram, ou que exerceram prática religiosa sem regularidade, apresentavam risco de óbito 1,87 vezes maior quando comparadas àquelas com prática de pelo menos uma vez por semana. Tal associação se traduziu em diferença de cerca de até sete anos adicionais na expectativa de vida [19]. Além disso, Strawbridge e colaboradores (1997), em estudo de longo seguimento, avaliaram 6.928 pacientes, entre 16 e 94 anos, durante 28 anos e encontraram que praticantes regulares de atividades religiosas também tiveram menores taxas de mortalidade, maior interrupção do tabagismo, maior aderência a atividades físicas regulares e maior suporte [24].

Estudos mostram que indivíduos com crenças religiosas lidam melhor com a doença e apresentam menores taxas de mortalidade [25], destacando a relação entre R/E com a saúde física. De fato, as pesquisam apontam para os benefícios dos indivíduos com maior R/E ou crenças religiosas, independentemente do tipo de religião.

As evidências científicas ao longo do tempo têm destacado o efeito protetor da R/E na saúde da população. Um grande estudo prospectivo (2016), publicado em importante revista médica (*JAMA)*, confirmou os achados de estudos anteriores em relação à mortalidade [21-23, 25]. A coorte intitulada: "*Nurses Health Study"* acompanhou 74 mil participantes do sexo feminino por 16 anos e descobriram uma associação inversa significativa entre a participação frequente aos serviços religiosos e mortalidade por todas as

causas, mortalidade cardiovascular e mortalidade por câncer. As mulheres que participaram mais de uma vez por semana tiveram mortalidade 33% menor durante os 16 anos quando comparadas as mulheres que nunca participaram de serviços religiosos [26].

Considerando tais efeitos protetores e benefícios para a saúde a Organização Mundial da Saúde incluiu atualmente a R/E como uma dimensão da qualidade de vida [27]. Estes achados são de grande relevância, pois alertam os profissionais da saúde para a necessidade de uma nova abordagem com seus pacientes e direciona para a importância de realizar um treinamento específico desses profissionais sobre como abordar as crenças, a R/E em seus atendimentos clínicos.

De fato, alguns estudos identificaram que a maioria dos pacientes gostaria que seus médicos abordassem sobre sua religião e espiritualidade [28, 29], e relataram que sentiriam mais empatia e confiança no médico se questionassem esses temas [30], proporcionando o resgate da relação médico-paciente, com uma visão holística e mais humanizada.

No entanto, apesar desses importantes resultados, pouco se sabe sobre os mecanismos fisiológicos pelos quais as crenças, e a fé do indivíduo podem influenciar na saúde e melhorar a qualidade de vida, especialmente em pacientes com doenças graves.

Considerando o campo da medicina respiratória, ainda existem poucos estudos que avaliaram o papel das crenças espirituais e religiosas em pacientes com doenças pulmonares crônicas [31-36]. Como ressaltado por Drescher (2011), estudos das crenças espirituais e religiosas poderiam fornecer um ponto de partida para futuras intervenções clínicas na área da

pneumologia [37]. Esta ideia baseia-se no fato de que, a literatura científica aponta para o importante papel da R/E na melhoria da qualidade de vida, no estado geral, na adesão as terapias propostas [27, 28], na saúde física [38] e mental dos pacientes com doença avançada [34].

1.3. Doenças Pulmonares Crônicas

Indivíduos com diagnóstico de doenças pulmonares crônicas, tanto obstrutivas quanto restritivas, apresentam como principais sintomas respiratórios a dispneia, a tosse e/ou a expectoração. Além disso, têm uma importante limitação ao exercício e uma redução da capacidade funcional, o que compromete substancialmente o bem estar dos pacientes, afetando de forma significativa sua qualidade de vida.

Apesar dos avanços científicos, ainda não há nenhuma terapia que comprovadamente possibilite a cura das doenças pulmonares crônicas. O comprometimento da qualidade de vida e da capacidade funcional representa um desafio no tratamento da doença, enfatizando a necessidade de buscar alternativas que contribuam para diminuir os sintomas dos pacientes.

Entre as doenças pulmonares obstrutivas, a Doença Pulmonar Obstrutiva Crônica (DPOC) caracteriza-se por sintomas respiratórios persistentes e limitação ao fluxo aéreo, que é devido a alterações nas vias aéreas e nos alvéolos causadas por exposições significativas a partículas e gases nocivos [39]. Atualmente é a quarta causa de morte no mundo [40], mais de 3 milhões de pessoas morreram de DPOC em 2012 representando 6% de todas as mortes globais. O tratamento visa redução de sintomas e do risco,

inclui terapia medicamentosa, reabilitação pulmonar, oxigenoterapia e transplante pulmonar em pacientes com doença avançada.

Por outro lado, as doenças pulmonares intersticiais (DPI´s) ou restritivas, são um grupo de doenças heterogêneas, crônicas, debilitantes, que podem resultar em cicatrização progressiva e fibrose do parênquima pulmonar, sendo agrupadas de acordo com achados clínicos e radiológicos. As DPI´s também têm sido um desafio para os especialistas, pois são raras, têm inúmeras causas, o diagnóstico requer conhecimento clínico, radiológico e patológico, apresentam um prognóstico variável e devem ser discutidas por equipe multidisciplinar em centros de referência. Neste grupo de doenças encontram-se: a fibrose pulmonar idiopática, a pneumonite de hipersensibilidade, a sarcoidose, a pneumonia intersticial não especifica, pneumonia em organização, as bronqueolites diversas entre outras [41-45].

Entre as doenças pulmonares intersticiais, a Fibrose Pulmonar Idiopática tem diagnóstico realizado tanto através de biopsia pulmonar, como por um conjunto de critérios clínicos e radiológicos. É considerada a forma mais grave de pneumonia intersticial pulmonar, é progressiva, fibrosante e com uma sobrevida de 3 a 5 anos, após o início dos sintomas [45]. Sem tratamento clínico efetivamente comprovado, a única intervenção viável para a doença, em sua fase avançada, ainda é o transplante de pulmão.

O transplante de pulmão está indicado para indivíduos com doença pulmonar terminal. O objetivo é melhorar a qualidade de vida, a sobrevida e as limitações físicas, como a dispneia, fraqueza e fadiga [46, 47]. A seleção e indicação de candidatos ao transplante são baseadas nos critérios das Diretrizes Internacionais para a Seleção de Candidatos a Transplante de

Pulmão da Sociedade Internacional de Transplante de Coração e Pulmão [47, 48].

Embora os aspectos emocionais e psicológicos como a ansiedade, a depressão, os problemas sociais e o condicionamento físico, afetarem de forma expressiva a vida de pacientes com doença pulmonar, poucos estudos investigaram o impacto de aspectos culturais e das crenças internas, como as crenças religiosas e espirituais nestas doenças.

Devido à cronicidade do quadro, às poucas opções de tratamento, aos efeitos adversos dos medicamentos e ao estigma da doença, os pacientes tendem a buscar outros tipos de suporte social e cultural que lhes forneçam formas alternativas de conforto físico e emocional. Neste contexto, alguns pacientes tendem a voltar a suas crenças religiosas e espirituais como uma forma de lidar com sua condição, o que poderia impactar no desfecho da sua doença.

Dessa forma, avaliar as crenças do indivíduo pode contribuir para o entendimento do lado emocional do paciente e portanto contribuir para melhorar o manejo e tratamento das doenças pulmonares crônicas. O conhecimento sobre as crenças pode preparar melhor o profissional de saúde para ter uma nova opção para auxiliar os pacientes ao abordar a R/E durante as consultas, possivelmente apoiando e incentivando estas práticas, quando presente nos pacientes, melhorando a relação médico-paciente.

De fato, estar em lista de transplante ou ter uma doença crônica, pode torna-se difícil para os pacientes lidarem com a expectativa da cura. A condição crônica e progressiva das doenças tem um forte impacto sobre a psique do indivíduo, gerando sentimentos de ansiedade, angústia, tristeza e até mesmo

questionamentos sobre o fim da vida. Dessa forma, procuramos descobrir como as crenças do indivíduo, podem auxiliar em situações de grande estresse, como acontece na doença avançada de pulmão.

Além disso, não encontramos estudos abordando a associação da R/E com a modulação do sistema nervoso autônomo (SNA) em pacientes com doença pulmonar crônica. O SNA, avaliado pela variabilidade da frequência cardíaca, é um parâmetro clínico, que tem sido utilizado como um marcador de risco e prognóstico dos pacientes com doenças crônicas. Kurita e colaboradores (2011) avaliaram 33 idosos com doenças crônicas, tais como, cardiovascular, pulmonar e cerebrovascular, que participaram semanalmente de sermões de 30 minutos, durante 20 meses, realizado por um capelão e compararam com grupo controle, que não participaram dessa atividade. O grupo que participou do sermão apresentou maior participação da modulação parassimpática e menores taxas de hospitalização do que no grupo controle [49].

Da mesma forma, encontramos alguns estudos que abordaram os benefícios da oração e da meditação sobre o sistema nervoso autônomo [50-52], porém os estudos apresentam fragilidades metodológicas, não foram bem controlados e foram conduzidos apenas com indivíduos saudáveis.

Considerando que as crenças religiosas e espirituais podem influenciar a saúde dos indivíduos, tanto pela associação com os parâmetros clínicos quanto com a qualidade de vida, será que a R/E poderia ter associação com a modulação do sistema nervoso autônomo? Essa pergunta permanece, sem resposta e respondê-la poderia contribuir para compreender o mecanismo de

ação pelo qual a R/E poderia agir sobre a mente, o corpo e consequentemente sobre a saúde física do individuo.

1.4. Sistema Nervoso Autônomo – SNA

Classicamente, o balanço simpatovagal, representado pela modulação do sistema nervoso simpático e parassimpático tem sido utilizado como um indicador de risco cardiovascular e morte súbita [53-56].

No contexto das patologias crônicas, também há evidências das alterações na modulação do SNA. Essas alterações provocam redução da variabilidade da frequência cardíaca (VFC), acompanhada de um predomínio da modulação simpática [57], com impacto negativo no prognóstico dos pacientes [58]. Os estudos apontam um desequilíbrio autonômico, em indivíduos com síndrome metabólica, doença renal crônica, câncer, hipertensão arterial [59-63], entre outras. Esses achados reforçam o interesse da ciência em pesquisar o envolvimento do SNA nas doenças, pois como já mencionado, o balanço simpatovagal é um marcador de risco e mortalidade. Quanto maior a modulação simpática em relação à parassimpática maior o prejuízo do balanço simpatovagal e pior o prognóstico da doença.

As alterações no balanço simpatovagal associadas ao risco nas doenças cardiovasculares, também foram demonstradas em pacientes com doenças pulmonares [64-69]. Pesquisas conduzidas na área da pneumologia apontam uma maior participação da modulação simpática em pacientes com hipertensão pulmonar [58, 64, 65, 70] e fibrose cística [66]. Da mesma forma, na doença pulmonar obstrutiva crônica (DPOC), os estudos demonstraram significativas

alterações no balanço simpatovagal, com redução da variabilidade da frequência cardíaca [67] e predominância da modulação simpática, o que consequentemente implica em maior risco cardiovascular e risco de morte em indivíduos com doença pulmonar [69, 71-73].

Este importante indicador de risco pode ser avaliado através de um simples eletrocardiograma, que pelas variações do intervalo RR (Figura 1), nos permite quantificar a participação do sistema nervoso simpático e parassimpático para o sistema cardiovascular. Essas variações do intervalo RR nos permite analisar a variabilidade da frequência cardíaca [57], um indicativo da capacidade de adaptação da frequência cardíaca com objetivo de manter a pressão arterial o mais estável possível.

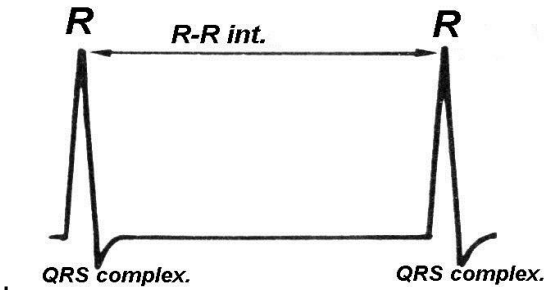

Figura 1: representação do intervalo R-R no eletrocardiograma

A relevância clinica da VFC foi primeiramente descrita em, 1965 quando Hon e Lee [74, 75] observaram que o sofrimento fetal era precedido por alterações nos intervalos entre os batimentos cardíacos (R-R), antes de ocorrer alteração na frequência cardíaca em si. Em 1977 Wolf e colaboradores mostraram uma associação da VFC diminuída e maior risco de mortalidade após infarto agudo do miocárdio (IAM) [76]. Mais tarde, pesquisas confirmaram que a VFC era um preditor importante de mortalidade após o IAM [77, 78].

As variações nos intervalos R-R podem ser avaliadas por diversos métodos, entre eles o método no *domínio da frequência* [79]. Esse método utiliza a análise espectral de uma sequência de intervalos R-R e fornece informações sobre como o poder (variância) é distribuído. Eles decompõem o ciclo cardíaco em diferentes ondas elementares de amplitude e frequência, em que gravações de poucos minutos (10 a 15 minutos), produzem até três picos de faixas de frequência. Neste estudo, utilizamos duas faixas de frequência, a baixa frequência (0,04 a 0,15 Hz – LF ou Low Frequency) e alta frequência (0,15 a 0,4 Hz – HF ou High Frequency), onde os poderes LF e HF são apresentados em valores absolutos de poder (m/s^2), mas também podem ser medidos em unidades normalizadas (n.u) ou percentual, que representam o valor relativo de cada poder na mesma proporção da potência total. O componente HF é considerado como a modulação da descarga do nervo vago, representando a atividade parassimpática, enquanto o componente LF representa a atividade simpática. A proporção de LF absoluta sobre o poder HF tem sido usada como um índice do balanço simpatovagal (LF/HF) [79].

Pouco se sabe sobre a participação da R/E tanto na fisiologia quanto na patologia das doenças. Parece que a R/E têm influência sobre o prognostico do paciente, no entanto, não está claro na literatura a forma como ela influencia a saúde física.

Sendo assim, acreditamos que indivíduos mais religiosos e espiritualizados podem ter um melhor funcionamento autonômico, ou seja, para melhorar o aspecto respiratório, muito comprometido neste pacientes, o aumento da modulação simpática melhora a função respiratória, bem como a captação e a distribuição de oxigênio pelo organismo. É sabido que o aumento

da modulação simpática favorece os aspectos respiratórios e a oxigenação celular [80]. Por outro lado, está bem descrito na literatura que a participação simpática aumentada aumenta o risco para eventos cardiovasculares.

Possivelmente os pacientes com doenças respiratória, com maior R/E apresentam maior qualidade de vida. Esperamos que maior R/E proporcione melhor qualidade de vida e este fato, possa se refletir em melhores parâmetros clínicos. Além disso, acreditamos que a R/E pode estar relacionada com o balanço autonômico.

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3. OBJETIVOS

3.1. *Objetivos principais:*

- Verificar se a R/E estão associadas com parâmetros clínicos e com a qualidade de vida dos pacientes com doenças pulmonares, inscritas em um programa de reabilitação pulmonar.
- Verificar se existe associação entre a R/E com a modulação simpática e parassimpática dos pacientes.

3.2. *Objetivos específicos:*

- Conhecer a R/E dos pacientes com doença pulmonar;
- Comparar a R/E dos pacientes, que aguardam em lista de transplante pulmonar com os pacientes que não estão em lista de espera, mas com diagnóstico de doença pulmonar;
- Avaliar a modulação simpática e parassimpática para o coração dos pacientes;
- Verificar se o balanço autonômico está associado com a qualidade de vida e com a função pulmonar dos pacientes com doença pulmonar intersticial.

4. Capítulo II – Artigos científicos

4.1 *Artigo 1*

Spirituality and religiosity are associated with quality of life in patients with lung disease.

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Spirituality and religiosity are associated with quality of life in patients with lung disease.

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Abstract

Patients were separated into two groups: (1) Non-Waiting List (NWL) and (2) Waiting List (WL) for the lung transplantation. We found greater levels of the faith and spirituality, in those awaiting transplantation. In the NWL group, higher “meaning” was associated with higher “vitality”, “emotional wellbeing” and “mental health”; higher “peace” was associated with higher “mental health”. In the WL group higher “peace” was associated with and better “mental health” and “emotional wellbeing”. Regardless of whether patients are lung transplantation candidates or not, Spirituality/Religiosity may help those with lung diseases cope better with their disease and have better quality of life.
Keywords: Spirituality; religiosity; quality of life; lung disease; lung transplantation.

Spirituality and religiosity are associated with quality of life in patients with lung disease.

Introduction

The chronic obstructive pulmonary disease (COPD) and Interstitial lung diseases (ILD) are two diverse groups of chronic lung conditions that cause significant morbidity and mortality. The patients with chronic lung diseases present dyspnea, coughing, limitation to exercise, and a decrease of the quality of life(2015., 2016). Both COPD and ILD are chronic and debilitating leading to a decline in physical health as well as decline in psychological health. The chronic nature of these diseases provides a major challenge to health professionals, because of a lack of affective treatment strategy.

Lung transplantation is indicated for individuals with end-stage lung disease to improve quality of life, survival (Orens, Estenne et al. 2006, Mehra, Canter et al. 2016), and physical limitations, such as dyspnea and fatigue (Florian, Rubin et al. 2013, Weill, Benden et al. 2015). Candidates for the procedure usually present pulmonary fibrosis (PF), COPD, pulmonary hypertension, sarcoidosis, and cystic fibrosis, inter alia (Kreider and Kotloff 2009, Weill, Benden et al. 2015). While depression, anxiety, social problems, and physical conditioning have been found to affect the lives of patients with lung disease, few studies have attempted to investigate the impact of cultural aspects and inner beliefs, such as religious and spiritual beliefs.

There is been an increasing number of scientific publications on spirituality and religiosity (S/R) in healthcare. According to Koenig et al., spirituality is the personal quest for answers to the ultimate questions about life, meaning, and the relationship with the sacred or transcendent, whereas

religiosity concerns the extent to which an individual believes, follows, and practices a religion (Koenig HG 2001).

In a recent bibliometric study conducted in PubMed for the period 1999–2013, Lucchetti et al. (2014) found 30,532 references on ‘spirituality, religion and health.’ They noted constant growth and consolidation in this field of research in the scientific community (Lucchetti and Lucchetti 2014). Studies show that individuals with religious beliefs cope better with disease and present lower mortality rates (Lucchetti, Lucchetti et al. 2011), highlighting the relationship of S/R with physical health.

In an extensive review, Koenig found an association between S/R with quality of life, mental and physical health. On the one hand, there was an inverse association with depression, suicide attempts, alcohol use, smoking, hypertension, and mortality. On the other hand, there was a positive association with immune function, quality of life, and emotions, such as hope, optimism, and purpose/meaning. In fact, the majority of studies were related to mental health, highlighting the need for further studies evaluating physical health outcomes (Koenig 2012).

Considering only the field of respiratory medicine, there are still only few studies assessing the role of spiritual and religious beliefs in chronic lung disease patients (Burker and Evon 2004., Burker, Evon et al. 2005, Green, Emery et al. 2011, Strada, Homel et al. 2013, Hasegawa, Kawai et al. 2017). As underscored by (Drescher 2011), studies of spiritual and religious beliefs could provide a starting point for future clinical interventions in the field of respiratory medicine. This idea is based on the fact that, the scientific literature suggests an

important role of S/R for the quality of life and mental health of patients with advanced disease.

To improve the respiratory condition of patients with chronic lung disease, the American Thoracic Society recommends pulmonary rehabilitation, independently of an indication for lung transplantation (Spruit, Singh et al. 2013). Therefore, this study aimed to investigate whether S/R could bring benefits to patients with chronic lung disease enrolled in a pulmonary rehabilitation program, evaluating if these beliefs are associated with clinical outcomes and quality of life in those awaiting lung transplantation or not. Moreover, it compared S/R among those awaiting lung transplantation or not.

Methods:

Study design:

This was an observational cross-sectional study carried out from October 2014 to December 2015. Data were collected after approval of the project by the Ethics Committee of the 'Irmandade Santa Casa de Porto Alegre, Brazil,' and has been performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki. Informed consent: "Informed consent was obtained from all individual participants included in the study."

Patients and setting

The study was conducted among patients with lung disease enrolled in the Pulmonary Rehabilitation Program at a private, non-profit hospital and Latin American reference in pulmonology and lung transplantation.

Eligibility criteria:

To be included in the study, the patients had to have a diagnosis of lung disease (i.e., obstructive disease and restrictive disease), be more than 18 years old, agree to participate, and be officially enrolled in the pulmonary rehabilitation program. The indication for lung transplantation, performed by the medical team was based on the criteria established by the international guidelines for the selection of lung transplant candidates (Orens, Estenne et al. 2006). The study included two groups: (1) patients not on the waiting list for lung transplantation or Non- waiting list (NWL), and (2) patients on the waiting list for lung transplantation or Waiting list (WL).

Procedures and instruments

After medical evaluation, a trained team collected data from patients while they were waiting for a physical therapy session. A brief interview was conducted to collect socio-demographic data, and to apply the questionnaires for quality of life, religiosity, and spirituality (self-reported). Clinical data were obtained from the patient's medical records.

Variables description:

1. *Sociodemographic data:* gender, age, and religious affiliation.

2. *Anthropometric data:* body mass index (BMI), weight, height, and circumference of waist (CW). Weight and height were measured using pre-calibrated instruments (Filizola® – capacity 150 kg). BMI was calculated as body weight in kg divided by height squared in m. CW was measured by placing an inelastic tape horizontally midway between the lowest rib margin and the iliac crest.

3. *Vital signs:* systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR). The subjects stayed seated in an upright position

with back support and were asked to relax for 5 min before starting the measurements. The BP cuff covered at least 80% of the upper arm and BP collection was repeated 3 times at 1-min intervals using an automatic digital device (Omron® BP785). When the difference in BP measurements was greater than 6 mmHg, the measurements were repeated until the difference was less than 4 mmHg (Pickering, Hall et al. 2005).

4. *Clinical evaluation:* Clinical data were collected before the rehabilitation sessions:

a) spirometry: to assess pulmonary function, where FEV_1 is forced expiratory volume in 1 s - the volume of air that the patient is able to exhale in the first second of forced expiration; FVC is forced vital capacity – the total volume of air that the patient can forcibly exhale in one breath; and the FEV_1/FVC ratio is the fraction of air exhaled in the first second relative to the total expired volume. The FEV_1 and FVC are expressed in liters or percentage.

b) six-minute walk test (6MWT): used to assess the functional capacity of patients (exercise tolerance). This test measures the distance (on a meter scale) that an individual can walk quickly in a period of 6 min on a flat surface (Weill, Benden et al. 2015). Before the test started, the participants sat at rest for at least 10 min;

c) the modified Borg Scale: for assessing dyspnea in patients at rest before the walk test. This is a vertical scale quantified from 0 to 10, where 0 is no symptoms and 10 is maximum symptoms (Mador, Rodis et al. 1995).

5. *Quality of life*: We used the Quality of Life Questionnaire SF-36, which consists of eight domains: functional capacity, physical aspects, pain, general health, vitality, social aspects, emotional aspects, and mental health. The SF-36

questionnaire has been validated in Portuguese (Aaronson, Muller et al. 1998, Cantarelli, Szejnfeld et al. 1999).

6. *Religiosity:* Religiosity was assessed by the Duke Religion Index (DUREL), which comprises a scale of five items measuring three dimensions of religiosity: (a) organizational religiosity: attendance at religious meetings (e.g., church, temple, study or prayer groups, etc.); (b) non-organizational religiosity: frequency of private religious activities (e.g., prayers, meditation, reading of religious texts, etc.); (c) intrinsic religiosity: the search for internalization and experience of religiosity as the main objective of the individual (subjective beliefs and motivation related to religiosity involvement), validated in Portuguese (Lucchetti, Granero Lucchetti et al. 2012).

7. *Spirituality:* Spirituality was measured with the Functional Assessment of Chronic Illness Therapy—Spiritual Well-Being Scale (FACIT-Sp-12), one of the instruments most used in the scientific community to measure spiritual well-being and also validated in Portuguese (Lucchetti, Lucchetti et al. 2013). FACIT-Sp-12 is a self-administered patient-reported questionnaire and uses a 5-point Likert-type scale (0 = not at all; 1 = a little bit; 2 = somewhat; 3 = quite a bit; and 4 = very much). The recall period for each question is seven days. The instrument consists of 12 items and 3 sub-domains of spiritual well-being, which help facilitate an in-depth exploration of the components that constitute spiritual well-being: peace, meaning, and faith (Jason M. Bredle, John M. Salsman et al. 2011).

Statistical analysis

To compare the means of age, the walking test, spirometry and hemodynamic data with normal distribution, Student's t-test for independent

samples was used; for the Borg Scale, without normal distribution, the Mann–Whitney test was used.

For the categorical variables, such as gender, religion, anthropometric data, and diseases, chi-square test was used. Fisher's exact test was used to compare the number of deaths between groups.

To explore the relation between religiosity or spirituality and clinical outcomes and quality of life, Spearman correlation and Pearson’s correlation coefficient were used, respectively.

Finally, multiple linear regression was applied. Only those S/R variables that showed statistical significance in the bivariate analysis were included. The regression was adjusted for age, gender, religion, diagnosis, BMI, and CW. All variables with skewed distribution underwent logarithmic transformation.

A value of $p \leq 0.05$ was considered significant. All analyses were performed using the Statistical Package for the Social Sciences, version 21.0 (SPSS Inc., Chicago, IL, USA).

Results

Characteristics of the subjects:

Of the 98 patients registered in the rehabilitation program, 80 (81.6%) agreed to participate in the study and 43 (53.8%) were on the waiting list for lung transplantation. The patient’s baseline characteristics are shown in table 1.

The mean age of patients was 59.2±14.8 years. Those on the lung transplant list were younger than the NWL group ($p<0.001$) and had lower CW ($p=0.004$). The most prevalent disease was COPD (50%) followed by PF (35%). PF was more prevalent in the patients on the waiting list for lung transplantation

(58.1%). On the other hand, COPD was more prevalent in patients not on the waiting list for lung transplantation (75.7%; p<0.001).

Concerning clinical parameters, there was no difference in the Borg Scale. In the 6MWT, we found differences in the distance walked in % (p<0.001) but not for the distance walked in meters. Regarding the spirometric measurements, we found significant differences in FVC (%; p=0.001) and the FEV1/FVC ratio (%; p=0.009) between groups. The systolic blood pressure was higher in the NWL group (p=0.031), but the heart rate was higher in the WL group (p=0.019). DBP did not differ between groups (p=0.372), but mortality was significantly higher in the WL group (p=0.033).

Religiosity and Spirituality

Most patients were Catholics (64%) and spiritist (10.7%). There were no differences between groups regarding organizational religiosity (p=0.889) and non-organizational religiosity (p=0.227), but intrinsic religiosity showed marginal significance (p=0.060; Table 2). Total spirituality was higher in the WL group (p=0.005), as was the score for faith (p=0.001; Table 3).

Relationship between spirituality and religiosity with clinical parameters and quality of life

a) Clinical parameters: In the NWL group only the organizational religiosity was correlated with forced vital capacity (FVC%, r=-0,331; P≤0.05). In the WL group there was a correlation between peace and the walking test (% predicted, r=0,386; P≤0.05), between the intrinsic

religiosity with (FEV_1, r=0,307; P≤0.05) and between (SBP, r=-0,404; P≤0.01).

b) Quality of life: In the NWL there were correlations between the non-organizational religiosity with mental health (r=0,341; P≤0.05), the meaning with physical aspects (r=0,332; P≤0.05), vitality (r=0,339; P≤0.05), emotional aspects (r=0,344; P≤0.05) and mental health (r=0,327; P≤0.05). The peace was correlated with social aspects (r=0,379; P≤0.05) and mental health (r=0,389; P≤0.05). In the WL group found there were a correlation between the non-organizational religiosity with functional capacity (r=0,413; P≤0.01), the intrinsic religiosity with physical aspects (r=0,392; P≤0.01), the peace with emotional aspects (r=0,322; P≤0.05) and mental health (r=0,474; P≤0.01).

On tables 4 and 5 are presented the multiple linear regression results. In the NWL group, the linear regression indicated that higher 'meaning' was associated with higher 'vitality', 'emotional well-being,' and 'mental health'; higher 'peace' was associated with higher 'mental health' (SF-36). In addition the organizational religiosity was inversely associated with FVC% of the pulmonary function. In the WL group, the linear regression showed that higher 'peace' was associated with better mental health, emotional aspects (SF-36) and greater distance walked (%; 6MWT).

Discussion

The most important finding of our study was that spirituality was significantly associated with quality of life in patients with lung disease, regardless of being candidates for the lung transplantation. Another relevant

data was that the WL group presented greater faith and total spirituality than the NWL group.

Concerning quality of life, we found peace and meaning associated with of the SF-36 domains. On the other hand, religiousness and faith were not associated to those parameters. In accordance to our results, several studies have highlighted the role of meaning and peace in mental health and well-being (Whitford and Olver 2012, Bai and Dixon 2014). Meaning and peace could have a greater influence on quality of life than religious beliefs *per se*. In other words, religious beliefs are important when people have meaning and a sense of deeper peace.

Despite the magnitude of the evidence in the field of spirituality and health, there is still a lack of studies in the respiratory disease. In agreement with our results, Green et al. (Green, Emery et al. 2011), evaluating the use of religious and spiritual coping in patients with emphysema, found that, after 2 years of follow-up, 90% of patients considered themselves at least slightly religious/spiritual, and most of them used religious coping strategies to deal with their illness. Moreover, Strada et al. (Strada, Homel et al. 2013) investigated the role of spiritual well-being in COPD patients, and similarly to our results, they found that spiritual well-being was positively associated with quality of life scores and mental health.

Religious coping strategies were frequent, and they were associated with mental health and functionality (Burker and Evon 2004.). In our study, the subdomains of spirituality, peace and meaning were also positively associated with emotional aspects, indicating that there is a facilitation of coping with the disease when belief is present in the patient's life.

In fact, religious and spiritual beliefs seem to be very important in severe illness, being used as a source of comfort, support, and hope for individuals coping with stressful situations (Koenig HG 2001). In our patients, we found high S/R in both groups, with higher levels of spirituality and faith in the WL group. Our data corroborates with the data of Burker et al. showing that patients, with severe and end-stage pulmonary diseases, seem to use coping strategies to deal with their limitations and expectations (Burker and Evon 2004., Burker, Evon et al. 2005), indicating that coping strategies are very important in the field of respiratory medicine.

Higher faith in WL group, possibly is due to the gravity of pulmonary disease and the imminent need for a transplant. This situation could be considered as stressful, and the faith probably contributes for having feelings of hope and optimism about their future. A similar use of coping strategies is also noted in other fields, such as palliative care and advanced heart and lung diseases (Vallurupalli, Lauderdale et al. 2012, Strada, Homel et al. 2013, Warmenhoven, Lucassen et al. 2016).

It is interesting to note that these beliefs could also affect the patients' clinical aspects. In our study, we found S/R correlated with some clinical parameters. Although there are several studies showing a relationship between S/R and health, according to Koenig and co-workers (2011), 80% of these studies investigated only the mental health (Koenig 2012). Therefore, more evidences are needed concerning physical health to draw attention to the importance of patients' beliefs for improve the physical and mental health, and thus improve outcomes. In general, the majority of studies have suggested that higher S/R are associated with lower levels of BP, fewer symptoms of pain,

lower mortality and better functioning of the immune system (Koenig 2012), emphasizing the importance of S/R for the patients' prognosis.

A recent meta-analysis (2015), evaluated religion, spirituality, and physical health in patients with cancer suggested that greater S/R is associated with better patient-reported physical health (Jim, Pustejovsky et al. 2015). This is in accordance with another study conducted in Brazil (Lucchetti, Lucchetti et al. 2011).

Regarding to the clinical aspects, the organizational religiosity was inversely associated with FVC% in the NWL group and the peace was positively associated with % of predicted of the 6MWT in the WL group. We found association between S/R with these clinical parameters, however, we cannot attribute this association to S/R because peace and organizational religiosity was not different in this groups.

To our knowledge, this is the first study to investigate the association between S/R, quality of life and clinical parameters in patients with lung disease, waiting or not for a lung transplantation. These results can help health professionals to deal with patients in end-stage lung disease, and understand how S/R can affect the treatment, as well as helping in the design of future interventions for these patients.

On the other hand, our study has some limitations: 1- It was a cross-sectional study in which a cause–effect relationship could not be established; 2- it is possible that the FACIT-Sp12 sub-scales, such as 'peace,' could have an overlap with mental health and well-being. Some authors have discussed whether these concepts (in this case 'peace') could have an overlap with mental health. For instance, the statement 'I feel peaceful' implies better mental health,

and some items included in the instrument, e.g. ‘I have a reason for living’ or ‘My life has been productive,’ have been associated with religious involvement, but do not in themselves denote religiosity/spirituality (Lucchetti, Lucchetti et al. 2013). Finally, patients were from a single institution.

Perspectives

Our results highlight the importance of training health professionals to recognize the spiritual and religious beliefs of their patients as a strategy for coping better with the disease, independently of lung transplantation. We believe that it is important for health professionals to support patients' beliefs as a way of benefiting their treatment. Future studies may address this objective, confirming our results in patients with chronic lung disease.

The authors declare no conflicts of interest**.**

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Table 1 – Characteristics of the subjects

Variables	All (n=80; 100%)	NWL[a] (n=37; 46,3%)	WL[b] (n=43; 53,8%)	*P*
Age (years)	59,2 ± 14,8	69,0 ± 9,3	50,7 ± 13,4	**<0,001***
Gender				0,269†
Male	41 (51,3)	16 (43,2)	25 (58,1)	
Female	39 (48,8)	21 (56,8)	18 (41,9)	
Religion *				0,396†
Catholic	48 (64,0)	22 (61,1)	26 (66,7)	
Spiritist	8 (10,7)	5 (13,9)	3 (7,7)	
Evangelical	6 (8,0)	2 (5,6)	4 (10,3)	
Others	5 (6,3)	1 (2,8)	4 (10,3)	
No religion	8 (10,7)	6 (16,7)	2 (5,1)	
CW – n(%)				**0,004**†
Without risk	43 (53,8)	13 (35,1)	30 (69,8)	
With risk	37 (46,3)	24 (64,9)	13 (30,2)	
BMI – n(%)				0,390†
Low weight/ malnutrition	13 (16,3)	4 (10,8)	9 (20,9)	
Eutrophic/ normal	31 (38,8)	14 (37,8)	17 (39,5)	
Overweight	36 (45,0)	19 (51,4)	17 (39,5)	
Diseases – n(%)				**<0,001**†
COPD	40 (50,0)	28 (75,7)**	12 (27,9)	
Pulmonary Fibrosis	28 (35,0)	3 (8,1)	25 (58,1)**	
Pulmonary hypertension	4 (5,0)	0 (0,0)	4 (9,3)	
Bronchiectasis	5 (6,3)	4 (10,8)	1 (2,3)	
Sarcoidosis	1 (1,3)	1 (2,7)	0 (0,0)	
Others	2 (2,6)	1 (2,7)	1 (2,3)	
6MWT				
BORG Scale resting	0 (0 – 2)	0 (0 – 1)	0 (0 – 2)	0,171‡
6MWD (m)	376,9 ± 104,7	387,9 ± 96,8	367,6 ± 111,1	0,393*
6MWD % of predicted	70,5 ± 21,7	82,3 ± 20,0	60,6 ± 17,9	**<0,001***
Spirometry				
FEV1 (L)	1,22 ± 0,62	1,15 ± 0,53	1,29 ± 0,69	0,297*
FEV1 (%)	43,6 ± 20,1	45,1 ± 18,1	42,3 ± 21,8	0,534*
FVC (L)	1,91 ± 0,69	1,99 ± 0,71	1,83 ± 0,67	0,312*
FVC (%)	55,8 ± 20,4	63,5 ± 20,5	49,1 ± 17,9	**0,001***
FEV1/FVC (%)	63,5 ± 23,4	56,3 ± 18,9	69,6 ± 25,2	**0,009***
Hemodynamics				
SBP	122,6 ± 19,3	127,6 ± 18,0	118,3 ± 19,5	**0,031***
DBP	77,2 ± 11,1	76,0 ± 9,3	78,2 ± 12,5	0,372*
HR	84,1 ± 15,4	79,8 ± 13,3	87,8 ± 16,2	**0,019***
Death (14 months)	9 (11,3)	1 (2,7)	8 (18,6)	**0,033**§

Groups: [a]NWL=Non-Waiting List and [b]WL=Waiting List. Diseases: COPD = chronic obstructive pulmonary disease. Hemodynamics: SBP= Systolic blood pressure, DBP= Diastolic blood pressure and HR=Heart Rate. *Student's t-test, †Chi-square test , ‡ Mann-Whitney U test; § Fisher exact test.

Table 2 – Data of Religiosity

Duke Religious Index	All (n=80; 100%)	NWL[a] (n=37; 46,3%)	WL[b] (n=43; 53,8%)	*P* *
Organizational Religiosity	3,65 ± 1,31 [4]	3,65 ± 1,25 [4]	3,65 ± 1,38 [4]	0,889
Non-organizational Religiosity	2,91 ± 1,72 [2]	3,14 ± 1,83 [2]	2,72 ± 1,62 [2]	0,227
Intrinsic Religiosity	5,45 ± 2,74 [5]	6,08 ± 3,13 [5]	4,91 ± 2,25 [4]	0,066

Groups: [a]NWL=Non-Waiting List and [b]WL=Waiting List. * Mann-Whitney U test. Data are presented as mean±standard deviation and median.

Table 3 – Data of Spirituality

Scores	All (n=80; 100%)	NWL[a] (n=37; 46,3%)	WL[b] (n=43; 53,8%)	*P**
Meaning	12,6 ± 2,1	12,4 ± 2,1	12,8 ± 2,1	0,381
Peace	11,5 ± 2,4	11,2 ± 2,4	11,7 ± 2,4	0,395
Faith	11,7 ± 3,5	10,3 ± 3,4	12,9 ± 3,2	0,001
Total	35,8 ± 5,6	34,0 ± 5,3	37,4 ± 5,4	0,005

Groups: [a]NWL=Non-Waiting List and [b]WL=Waiting List. *Student's t-test. Data are presented as mean±standard deviation.

Table 4 – Association between religiosity, spirituality, clinical data and quality of life of patients out the waiting list for lung transplantation: NWL group.

Outcomes	Multiple linear regression models *				
	Regression Coefficient (IC 95%)	Beta	*P*	R^2	R^2 adjusted
CLINICS					
FVC (%)					
Organizational Religiosity	-5,83 (-11,8 a 0,12)	-0,36	0,054	21,2%	5,4%
QUALITY OF LIFE					
Physical Aspects					
Meaning	4,67 (-1,74 a 11,0)	0,28	0,147	12,6%	4,9%
Vitality					
Meaning	4,09 (0,31 a 7,88)	0,37	0,035	32,9%	19,5%
Social Aspects					
Peace	3,36 (-0,44 a 7,16)	0,29	0,081	40,3%	28,3%
Emotional Aspects					
Meaning	8,72 (1,14 a 16,3)	0,42	0,026	21,1%	5,3%
Mental Health					
Meaning	4,50 (1,07 a 7,94)	0,44	0,012	33,8%	20,6%
Peace	3,80 (0,67 a 6,93)	0,42	0,019	32,0%	18,3%

*Adjusted for age, gender, religion, diagnosis, BMI and CW.

Table 5 – Association between religiosity, spirituality, clinical data and quality of life of patients waiting in list for lung transplantation: WL Group.

Outcomes	Multiple linear regression models *				
	Regression Coefficient (IC 95%)	Beta	*P*	R^2	R^2 adjusted
CLÍNICS					
6MWD % of predicted					
Peace	2,41 (0,26 a 4,56)	0,32	0,029	38,8%	24,4%
FEV1 (%)					
Intrinsic Religiosity	2,11 (-0,20 a 4,42)	0,22	0,072	61,7%	52,7%
SBP					
Intrinsic Religiosity	-1,95 (-4,63 a 0,73)	-0,22	0,149	35,9%	20,8%
Faith	1,56 (-0,42 a 3,54)	0,25	0,118	36,6%	21,7%
DBP					
Faith	1,10 (-0,26 a 2,46)	0,28	0,110	24,1%	9,0%
QUALITY OF LIFE					
Functional Capacity					
Non-organizational Religiosity	3,46 (-0,17 a 7,09)	0,32	0,061	26,6%	11,9%
Physical Aspects					
Intrinsic Religiosity	0,89 (-2,15 a 3,93)	0,09	0,556	38,4%	26,0%
Emotional Aspects					
Peace	5,31 (0,34 a 10,3)	0,29	0,037	40,3%	28,4%
Mental Health					
Peace	3,71 (0,73 a 6,69)	0,37	0,016	30,3%	16,3%

*Adjusted for age, gender, religion, diagnosis, BMI and CW.

4.2 Artigo 2

Sympathetic modulation and religiosity/spirituality in patients with interstitial pulmonary disease.

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Sympathetic modulation and religiosity/spirituality in patients with interstitial lung disease.

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Abstract

Purpose of the research: evaluate the sympathovagal balance, the religiosity and spirituality (R/S) of patients with interstitial lung disease (ILD) who participate in a pulmonary rehabilitation program. In addition, verify whether the R/S is associated with sympathetic and parasympathetic modulation, and with quality of life. *Principal results***:** The patients with ILDs presented a sympathovagal imbalance with predominance of sympathetic modulation. Our sample of patients was considerably religious and spiritualized. Moreover, the peace was correlated with the sympathetic modulation. The forced vital capacity was positively correlated with sympathetic modulation and with sympathovagal balance, but negatively correlated with parasympathetic modulation. The R/S were positively correlated with the domains the quality of life. *Conclusions*: Our study, for the first time, demonstrated the relationship of R/S with physiological parameters in ILDs patients, which ultimately, might improve also the quality of life.

Keywords: Spirituality, religiosity, peace, autonomic balance, sympathovagal balance, interstitial lung diseases.

Introduction

Interstitial lung diseases (ILDs) are a heterogeneous group of lung diseases. They are rare, progressive, with variable degrees of tissue inflammation and fibrosis. The IDLs are considered a challenge for the clinicians because there is still no cure [1, 2].

Patients diagnosed with chronic respiratory disease have some common symptoms such as dyspnea, cough and fatigue [3]. These symptoms result in limitation to exercise and to the daily activities, which compromise the quality of life of the individual [4, 5]. The exacerbations have a negative impact in patients' life due to the accelerated disease progression, which can result in hospital admission and death [6].

Considering that pulmonary diseases are limiting, that the individuals has loss of functional capacity and of physical conditioning, researchers has been recently suggested that religiosity and spirituality (R/S) can benefit patients with chronic diseases. Studies have shown that higher R/S are directly associated with better quality of life [7-9], better immune function [10, 11] and inversely associated with pain [12, 13] depression [14, 15] and mortality [16-19].

Furthermore, several observational studies have demonstrated that depression and emotional distress are associated with cardiovascular and pulmonary diseases [20-24]. The relationship between psychological states and health has long been studied. Consistently, it has been demonstrated that emotions as sadness, depression, can lead to disease and even death [25-31]. Thus, the R/S can be an important protective factor against these emotional reactions. Therefore, assess the religious beliefs and its impact on health might be explored as an important health care strategy.

Within this framework, sympathovagal imbalance has been pointed out as an important risk factor in patients with heart disease. The sympathovagal balance can be measured, through the heart rate variability, to assess the prognosis of patients with chronic diseases, as well as the risk of death [32-35]. It has been demonstrated in the pulmonary diseases, such as pulmonary hypertension [36-38], chronic obstructive pulmonary disease (COPD) [39-41] and cystic fibrosis [42], that there is a predominance of the sympathetic modulation [36, 37, 42]. Surprisingly, there is no data in the literature showing the sympathovagal balance in patients with interstitial lung disease.

Therefore, considering that emotions and religious beliefs can influence physical health, the objective of this study was to evaluate the sympathovagal balance and R/S of patients with ILDs, as well as the possible association among these parameters.

Methods

The study was approved by the Ethics Committee of *Universidade Federal de Ciências da Saúde de Porto Alegre.* In addition, all participants agreed to participate and signed the informed written consent.

Type of Study and Location. It was a cross-sectional study conducted between October 2014 and December 2015 in a Pulmonary Rehabilitation Service of a Hospital in Porto Alegre, Brazil.

Subjects: Twenty-four patients with ILD, older than 18 years, without cognitive difficulties and enrolled in the pulmonary rehabilitation program, were invited to participate. The diagnosis was based on the clinical, radiological and pathological criteria, being confirmed by the histopathological result of the surgical part and/or pulmonary biopsy.

Procedures: In the first week of participation in the pulmonary rehabilitation program, patients were interviewed about their demographic data, religiosity and spirituality. To sympatovagal balance evaluation, patients were invited to rest for 10-minute in a separate room to perform the electrocardiogram (ECG) recording. After, they were conducted to the rehabilitation to do physical exercise. The patient's diagnosis, pulmonary function test (spirometry), medication and the results from the 6-minute walk test were obtained from their medical record. They were also interviewed to complete a questionnaire that covered the following aspects:

I. D*emographics characteristics:* sex, age and religious affiliation.

II. *Anthropometric data:* body mass index (BMI), weight and height. Weight and height were measured using pre-calibrated instruments (Filizola® – capacity 150 kg).

III. *Vital signs:* systolic blood pressure (SBP), diastolic blood pressure (DBP) and heart rate (HR), using an automatic digital device (Omron® BP785) [43].

IV. *Clinical data:* They were collected before the rehabilitation sessions: a) Spirometry: to assess pulmonary function, where FVC is forced vital capacity – the total volume of air that the patient can forcibly exhale in one breath, FEV_1 is forced expiratory volume in 1 s (the volume of air that the patient is able to exhale in the first second of forced expiration), and FEV_1/FVC is the ratio; b) The six-minute walking test (6MWT): was conducted in all patients, to assess the functional capacity (exercise tolerance) according described in the ATS guidelines [44]. This test measures the distance, on a meter scale, that an individual can walk quickly in a period of 6 min on a flat surface, in enclosed 30-

m long corridor in the hospital. Before the test started, the participants sat at rest for at least 10 min; c) The modified Borg Scale: for assessing dyspnea in patients at rest before the walk test. This is a vertical scale quantified from 0 to 10, where 0 is no symptoms and 10 is maximum symptoms [45]. d) Medication: all patients were taking medicines that, somehow, contribute to decrease blood pressure.

V. *Religiosity:* Religiosity was assessed by the Duke Religion Index (DUREL), which comprises a scale of five items measuring three dimensions of religiosity: (a) organizational religiosity: attendance at religious meetings (e.g., church, temple, study or prayer groups, etc.); (b) non-organizational religiosity: frequency of private religious activities (e.g., prayers, meditation, reading of religious texts, etc.); (c) intrinsic religiosity: the search for internalization and experience of religiosity as the main objective of the individual (subjective beliefs and motivation related to religiosity involvement), validated in Portuguese [46].

VI. *Spirituality:* Spirituality was measured with the Functional Assessment of Chronic Illness Therapy—Spiritual Well-Being Scale (FACIT-Sp-12), one of the instruments most used in the scientific community to measure spiritual well-being and also validated in Portuguese [47]. FACIT-Sp-12 is a self-administered patient-reported questionnaire and uses a 5-point Likert-type scale (0 = not at all; 1 = a little bit; 2 = somewhat; 3 = quite a bit; and 4 = very much). The recall period for each question is seven days. The instrument consists of 12 items and 3 sub-domains of spiritual well-being, which help facilitate an in-depth exploration of the components that constitute spiritual well-being: peace, meaning, and faith [48].

VII. *Sympatovagal balance:* It is obtained by an ECG recording to evaluate the low and high frequency components and the heart rate variability, as described below. Subjects were at rest in the supine position in a quiet room. They were advised to remain motionless in a comfortable position. Disposable electrodes were placed on the skin of the chest to collect electrocardiographic signals [49] for 10 minutes. Continuous ECG signals were recorded by a Wincardio system (Micromed Biotecnologia, series nº 1444107, ANVISA registration 10307270007) at 600 Hz sampling rate.

The temporal series were analyzed in the program Kubius 2.0 (University of Kuopio, Kuopio, Finland) where the ECG signal was processed to obtain the variables related to HRV in the frequency domain. The analysis of HRV was performed using a fast Fourier transform (FFT) in portions of 5 minutes with 4 Hz interpolation and an overlap of 50%. The low frequency component (LF; 0.04 to 0.15 Hz; predominantly corresponds to sympathetic modulation) and the high frequency component (HF; 0.15 to 0.4 Hz; predominantly corresponds to parasympathetic modulation). The components LF and HF were presented in absolute (LFa or HFa; ms^2) and normalized (LFnu or HFnu; %) units. Normalized units were obtained by dividing the power of a given component by the total power, from which very low frequency -VLF was subtracted, and multiplying by 100. The ratio between the absolute values (LF/HF) was used as an index of the autonomic modulation to the heart or sympatovagal balance [50].

Statistical analysis

Data were presented as frequency and percentage or mean±SD. The Spearman's correlation test was used for assessment of linear association. We

assumed the cut-off values of r, 0-0.19 is regarded as very weak, 0.2-0.39 as weak, 0.40-0.59 as moderate, 0.6-0.79 as strong and 0.8-1 very strong [51]. Statistical significance was accepted at $P<0.05$. All statistical analyses were performed using the Statistical Package for the Social Sciences (PASW Statistics for Windows, Version 18.0. Chicago: SPSS Inc).

Results

The demographic and clinical data of the twenty-four patients with interstitial lung disease, as well as the walking test (6MWT), quality of life (SF-36), spirituality (FACIT-Sp-12) and religiosity (DUREL) are summarized on table 1. Regarding to religious affiliation, 62% reported to be catholics, 8% spiritists, 8% evangelic, 8% others and 8% self-declare with no religious affiliation.

The sympathovagal balance results are shown on table 2. Our data demonstrated a predominance of the sympathetic modulation, seen by the LF/HF ratio.

There was a positive correlation between peace (FACIT-Sp12) and LFa, that represent the sympathetic modulation (r=.437; P=0.03). Moreover, there was also a positive correlation between the peace with emotional aspects and mental health of the quality of life. The total spirituality score was positively correlated with emotional aspects. There was positive correlation of the non-organizational religiosity with functional capacity and with physical aspects. The intrinsic religiosity also was positively correlated with physical aspects of the quality of life (table 3).

The FVC, in liters, was positively correlated with LFnu (r=.424; P=0.03) and with LH/HF ratio (r=.417; P=0.04). On the other hand, the HFnu band was negatively correlated (r=-.418; P=0.04) with FVC, also in liters.

The total HRV was positively correlated with social aspects (r=.531; P≤0.01) and functional capacity (r=.391; P≤0.05) of the quality of life. The emotional (r=.414; P=0.04) and social aspects(r=.546; P≤0.01) were positively correlated with the LFa band.

Discussion

To our knowledge, this research is the first to show that Spirituality is correlated with the autonomic nervous system in patients with ILDs. We also found high R/S and a correlation between peace and the LFa component, or sympathetic modulation. Moreover, R/S and autonomic modulation, HRV and LFa, were positively correlated with quality of life.

The Spiritual Well-Being Scale (FACIT-Sp-12) is the most widely used measure of spiritual wellbeing among those with chronic illness. Despite the absence of references which could facilitate the scores interpretation, we have found a similar total score (37 points) compare to the score (36 points) of patients with cancer [52]. On the other hand, our patients showed a higher score comparing to patients with COPD (27 points) and lung cancer (26 points) [53]. This difference could be due to the nationality because it is known that people from different countries usually have different wellbeing interpretation. In the study of Hasegawa et al., the patients were Japanese and, thus, the cultural difference may influence the scores.

Berntson et al. [54] suggest that the spirituality is associated with a specific pattern of the cardiac autonomic regulation, indicating that this pattern

of autonomic control may have significance in the health. In fact, the autonomic pattern, described by those authors, is in agreement with our results. Interestingly, in our group of patients, there was a positive correlation between peace and LFa, or sympathetic modulation, but not with parasympathetic. We could speculate that the increase in sympathetic modulation probably improves the respiration and thus, the sensation of peace.

Moreover, Kurita et al. demonstrated that elderly individuals with cardiovascular, cerebro-vascular and pulmonary disease, participating in a 30 minutes sermons/weekly had greater parasympathetic modulation and higher IL10/IL6 ratio, than the control group. They conclude that, spiritual activation can modify the inflammatory status in favor to anti-inflammatory cytokines, reducing the hospitalization probably due to an increase parassympathetic modulation [55]. It is necessary to point out that this study was interventional, the subjects participated in a group activity, with sermon by chaplains for twenty months, and they were compared to a group that did not have any socialization. In our patients, compared to parasympathetic, the sympathetic modulation was higher. These opposite results are probably due to the difference in the disease and age. Our patients were younger and our study was transversal.

On the other hand, in agreement with our results, patients with pulmonary disease presented a sympathovagal imbalance with predominance of sympathetic modulation [36-42, 56]. Despite the greater cardiovascular risk provoked by the increase in sympathetic modulation, this activation promotes bronchodilation and improves the breathing efficiency. Shirai et al, 1995, on an experiment study, demonstrated that, during hypoxia, the sympathetic modulation plays an important role in facilitating vasodilation via β adrenergic

receptor [57]. Moreover, in accordance to Shirai et al, 1995, our data demonstrated a positive correlation between FVC (L) with LFnu and LF/HF ratio, but an inverse correlation with HFnu.

We strongly believe that a higher participation of the sympathetic, favors the breath and this is reflected in better patients' quality of life. In fact, our hypothesis is confirmed also by the correlation between LFa with social and emotional aspects. In addition, this increase in sympathetic modulation, and its effect over respiration, probably improves also the sensation of peace, as mentioned before.

Our results showed that patients with ILDs had a higher score in intrinsic religiosity, but there was no correlation with the LF/HF ratio, or autonomic balance. On the other hand, the intrinsic religiosity, the non-organizational religiosity, peace and total spirituality were associated with the domains of the quality of life. In agreement with several studies, we also found that R/S are associated with quality of life. According to the literature, the R/S were positively associated with better quality of life in depressive patients [58], bipolar disorder [59], cancer [60] and in palliative care [9]. These results demonstrate that the private religious activities or individual can benefit the patient´s quality of life, independently of group participation.

Although we did not find in our study an association between religiosity with LF/HF ratio or with heart rate variability (HRV), Stanley et al. (2009) demonstrated the effect of prayer in improving HRV. This result demonstrate a psychophysiological effect [61] over the autonomic nervous system. In addition, Bernardi et al. verified that prayer and yoga mantras increased the baroreflex sensitivity [62], indicating that there is an interaction between emotional and

physics parameters. The differences among results could be explained by the fact that, in those studies, the participants were healthy, possibly were trained in those practices. It is very well demonstrated in the literature that the muscle inspiratory training can improve some parameters, such baroreflex, changing the autonomic balance [63].

The data from the literature, and ours results, demonstrate the benefits of R/S in individuals with chronic diseases. The beliefs are used as a support to deal with stressful situations [64], such as having an advanced disease or being in a list for a lung transplantation. In addition, the autonomic nervous system is influenced by the emotions, stress or by the disease itself. Our study is the first to demonstrate a correlation between the autonomic nervous system and spirituality in patients with interstitial diseases and transplant candidates.

Furthermore, it is important to highlight that Brazilians may be more religious than other populations. Data from the World Values Survey: (2010-2014), show that 51% of Brazilians, but only 7.9% in Sweden, reported that religion was very important in their lives. Intervention or controlled follow-up studies should be conducted in a larger sample of ILDs patients, to evaluate whether beliefs, or simply prayer, may bring benefit to patients such as autonomic balance modulation. Our study has as a strong point, the fact that it is the first to evaluate the association between the R/S with the autonomic balance in patients with ILDs.We conclude that patients with ILDs present autonomic imbalance and a sympathetic modulation predominance. The sympathetic domain probably contributed to a greater sense of peace. Besides that, the high R/S contributed to improving the quality of life of patients.

Conflicts of interest: none.

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Tables:

Table 1. Demographic and clinical characteristics of the patients with interstitial lung disease.

Variables	N=24
Male	15 (62.5)
Age, years	51±14
BMI, kg/m^2	24±4.89
SBP, mmHg	115±15
DBP, mmHg	75±9
HR	85±16
Pulmonary function test	
FVC, L	1.77±0.44
FVC, % of predicted	48±12
FEV_1, L	1.52±0.49
FEV_1, % of predicted	49±15
FEV_1/FVC ratio	0.85±0.16
6MWT	
Distance, meters	401±102
Predicted distance, %	67±18
Modified Borg scale (0-10)	
Resting dyspnea	0.6±1
Post-exercise dyspnea	5.5±2
Δ dyspnea	4.9±2
Quality of life – SF-36	
Functional capacity	26±20 / 25
Physical aspects	07±22 / 0
Pain	57±26 / 51
General health	45±21 / 43
Vitality	50±22 / 52
Social aspects	62±29 / 68
Emotional aspects	38±42 / 33
Mental health	73±23 / 80
FACIT-Sp-12	
Meaning	13±2.0
Peace	11±2.3
Faith	12±3.3
Total	37±5.5
DUREL	
Organizational Religiosity	3.6±1.4
Non-organizational Religiosity	2.6±1.6
Intrinsic Religiosity	4.7±2.3

Values are n (%) or mean±standard deviation or median. BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; HR: Heart rate; FEV_1, forced expiratory volume of 1 second; FVC, forced volume vital capacity; FEV_1/FVC ratio, L: Liters, %: Percent.

Table 2. Spectral analysis of the patients with interstitial lung disease.

Variables	N=24
HRV, ms^2	695±838
LF a, ms^2	186±234
HF a, ms^2	155±428
LF nu, %	68±17
HF nu, %	31±20
LF/HF ratio	3.2±2.3

Note: Data were presented as mean±SD. HRV: heart rate variability; LF: low-frequency component; HF: high-frequency component; LF/HF: ratio;; a, ms^2: absolute units, nu, %: normalized units; SD: standard deviation.

Table 3. Correlation between the quality of life (SF-36), religiosity and spirituality of the patients with ILDs (n=24).

Variables	Functional capacity	Physical aspects	Pain	General health	Vitality	Social aspects	Emotional aspects	Mental health
FACIT-Sp-12								
Meaning	.222	.008	.183	.386	.136	.082	.126	.022
Peace	-.079	-.171	-.008	.162	-.029	.151	**.499#**	**.457#**
Faith	-.017	.192	-.216	-.128	-.151	-.195	.261	.002
Total	-.006	-.273	-.099	.060	-.089	-.046	**.390#**	.122
DUREL – Religiosity								
Organizational	.131	.219	.207	.158	.032	.273	-.200	.377
Non-organizational	**.471#**	**.471#**	.024	.182	-.218	.204	.225	-.091
Intrinsic	-.002	**.425#**	-.173	.081	.084	.091	.111	.051

$P \leq 0.05$ was considered statistically significant.

5. CONCLUSÃO

Neste grupo de pacientes com doenças pulmonares, provenientes de vários estados brasileiros, encontramos indivíduos altamente religiosos e espiritualizados. Ressaltamos que, todos pacientes apresentavam importante comprometimento da função pulmonar e limitação da capacidade funcional, independente de estar ou não em lista, porém nossos resultados mostraram que os pacientes em lista de transplante tinham mais fé e maior espiritualidade. Nossas evidências apontam que, os pacientes mais espiritualizados têm melhor qualidade de vida.

Os pacientes com doença pulmonar intersticial apresentaram desequilíbrio simpatovagal e predominância da modulação simpática. Além disso, a modulação simpática e a VFC estavam relacionadas com a qualidade de vida. Acreditamos que a modulação simpática esteja promovendo a broncodilação, e consequentemente uma melhora na respiração do paciente. Este fato provavelmente contribui para uma maior sensação de paz e melhor qualidade de vida para pacientes com doença intersticial. Além disso, a R/E se correlacionou com os aspectos da qualidade de vida neste grupo de pacientes.

Independentemente do tipo de doença pulmonar, apoiar as crenças dos pacientes pode contribuir para uma melhor qualidade de vida e apoio para enfrentar uma situação de estresse, como estar em lista de transplante ou ter uma doença crônica.

6. ANEXOS

ANEXO 1 - Parecer de Aprovação do Comitê de Ética da Santa Casa De Misericórdia de Porto Alegre

IRMANDADE DA SANTA CASA DE MISERICORDIA DE PORTO ALEGRE - ISCMPA

PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: ASSOCIAÇÃO ENTRE RELIGIOSIDADE, ESPIRITUALIDADE E O SISTEMA NERVOSO AUTÔNOMO DE PACIENTES QUE PARTICIPAM DE UM PROGRAMA DE REABILITAÇÃO CARDIOPULMONAR

Pesquisador: Katya Vianna Rigatto

Área Temática:

Versão: 1

CAAE: 35070514.0.0000.5335

Instituição Proponente: Irmandade da Santa Casa de Misericordia de Porto Alegre - ISCMPA

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 791.132

Data da Relatoria: 22/08/2014

Apresentação do Projeto:

A pesquisadora descreve que nas últimas décadas, pesquisas científicas abordando as crenças religiosas e espirituais dos pacientes e sua influência na saúde mental e física têm crescido de forma expressiva, despertando o interesse de diversos profissionais e pesquisadores,principalmente na área da saúde. Justifica que apesar da existência de pesquisas sobre religiosidade e espiritualidade na área clínica, muito pouco se sabe sobre a sua participação tanto na fisiologia quanto na patologia das doenças.

Objetivo da Pesquisa:

O objetivo principal desse trabalho é verificar se existe alguma associação entre o sistema nervoso autonômico com a religiosidade e espiritualidade dos pacientes com doenças cardiopulmonares graves.

Avaliação dos Riscos e Benefícios:

Não há riscos diretos aos participantes.

Comentários e Considerações sobre a Pesquisa:

Tipo de pesquisa:estudo de coorte com 3 meses de seguimento

Caracterização da amostra: Inclusão: Pacientes com idade a 18 anos, portadores de doenças

Endereço: R. Profº Annes Dias,285 Hosp.Dom Vicente Scherer
Bairro: 6º andar - Centro **CEP:** 90.020-090
UF: RS **Município:** PORTO ALEGRE
Telefone: (51)3214-8571 **Fax:** (51)3214-8571 **E-mail:** cep@santacasa.tche.br

cardiopulmonares, encaminhados para o programa de reabilitação pulmonar. Exclusão:Paciente com distúrbio clínico que comprometa sua participação ou
conclusão neste estudo;Pacientes portadores de marca-passo.
TCLE:elaborado dentro das normas
Coleta de dados: bem esclarecido.
Análise dos dados:A normalidade dos dados será verificada através do teste Shapiro-Wilk. Com basenos resultados obtidos, serão calculadas as médias e os desvios padrões. Para a
comparação entre os dois momentos (1° dia e 3° mês) das avaliações utilizaremos teste t
pareado. Para verificar as possíveis associações entre as variáveis, será utilizada a
correlação de Pearson. Os resultados serão analisados através do software Statistical
Package for Social Sciences (SPSS), versão 17.0 e os valores serão considerados
significativos quando o $p<0,05$.
Orçamento: Total:R$ 976,00, sendo o custo da responsabilidade do pesquisador.

Considerações sobre os Termos de apresentação obrigatória:
Foram apresentados todos os documentos necessários para a realização da pesquisa.

Recomendações:

Conclusões ou Pendências e Lista de Inadequações:
Após discussão em plenária o referido protocolo de pesquisa foi aprovado.

Situação do Parecer:
Aprovado

Necessita Apreciação da CONEP:
Não

Considerações Finais a critério do CEP:
Após avaliação do protocolo acima descrito, o presente comitê não encontrou óbices quanto ao desenvolvimento do estudo em nossa Instituição e poderá ser iniciado a partir da data deste parecer.

Obs.: 1 - O pesquisador responsável deve encaminhar à este CEP, Relatórios de Andamento dos Projetos desenvolvidos na ISCMPA. Relatórios Parciais (pesquisas com duração superior à 6 meses), Relatórios Finais (ao término da pesquisa) e os Resultados Obtidos (cópia da publicação).

Endereço: R. Profº Annes Dias,285 Hosp.Dom Vicente Scherer
Bairro: 6º andar - Centro **CEP:** 90.020-090
UF: RS **Município:** PORTO ALEGRE
Telefone: (51)3214-8571 **Fax:** (51)3214-8571 **E-mail:** cep@santacasa.tche.br

2 - Para o início do projeto de pesquisa, o investigador deverá apresentar a chefia do serviço (onde será realizada a pesquisa), o Parecer Consubstanciado de aprovação do protocolo pelo Comitê de Ética.

PORTO ALEGRE, 15 de Setembro de 2014

Assinado por:
Claudio Teloken
(Coordenador)

Endereço: R. Profº Annes Dias,285 Hosp.Dom Vicente Scherer
Bairro: 6º andar - Centro **CEP:** 90.020-090
UF: RS **Município:** PORTO ALEGRE
Telefone: (51)3214-8571 **Fax:** (51)3214-8571 **E-mail:** cep@santacasa.tche.br

ANEXO 2 - Termo De Consentimento Livre E Esclarecido

Termo de Consentimento Livre e Esclarecido

Você está sendo convidado para participar, como voluntário, de uma pesquisa intitulada: **ASSOCIAÇÃO ENTRE RELIGIOSIDADE, ESPIRITUALIDADE E O SISTEMA NERVOSO AUTÔNOMO DE PACIENTES QUE PARTICIPAM DE UM PROGRAMA DE REABILITAÇÃO CARDIOPULMONAR.** Após ser esclarecido sobre as informações a seguir, no caso de aceitar fazer parte do estudo, assine ao final deste documento que está em duas vias. Uma delas é sua e a outra é do pesquisador responsável.

Embora muitos esforços tenham sido direcionados para compreender melhor as doenças cardiopulmonares, o tratamento ainda não permite a cura dessas doenças. Na tentativa de buscar mais recursos para tratar os pacientes, e importante que estudos sejam realizados com este objetivo. Dessa forma, esta pesquisa está sendo realizada para tentar identificar se a sua religiosidade e espiritualidade podem estar associadas com a sua saúde.

Se você aceitar participar deste estudo, você será entrevistado sobre sua religiosidade, espiritualidade, mediremos seu peso, altura e quantidade de gordura do seu corpo. Vamos lhe perguntar também sobre sua alimentação nas últimas 24 horas. Para avaliação da composição corporal será realizado um exame chamado bioimpedância. Esse exame não vai lhe causar nenhuma dor e não representa nenhum risco para sua saúde. Terminada essa etapa vamos fazer também um exame chamado de eletrocardiograma ou ECG. Se o paciente for homem será necessário depilar o local onde os eletrodos serão fixados. O ECG nos dará mais informações sobre a sua saúde. Todos os procedimentos serão realizados no ambulatório de reabilitação pulmonar do Hospital Pereira Filho sem nenhum custo para você. Após 2 meses vamos deixar agendado um retorno para repetirmos as mesmas avaliações.

Antes de assinar concordando em participar desse estudo, por favor, leia com atenção as informações abaixo e aproveite este momento para esclarecer todas as dúvidas com o pesquisador que lhe apresentou o estudo e sinta-se à vontade para tirar dúvidas a qualquer momento que desejar.

Ao longo do estudo, caso surja alguma outra dúvida, você poderá esclarece-las pelo telefone abaixo, diretamente com os pesquisadores: Profª. Dr. Katya Vianna Rigatto, pelo telefone: (51) 8115 0246 ou 3303-8753 ou e-mail: krigatto@gmail.com; a Nutricionista: Ana Amélia Machado Duarte - Telefones para contato: (051) 91085534 ou 85548558. Ou pelo e-mail: anamachadoduarte@gmail.com; ou o Fisioterapeuta: Fabrício Farias da Fontoura pelo telefone (51) 8188 0499 ou pelo e-mail: fabtramp@hotmail.com. Telefone do Comitê de ética em Pesquisa para contato: (051) 3214-8571.

Todos os procedimentos são simples e garantimos que todos os seus dados serão utilizados de forma anônima, confidencial e exclusivamente para fins de estudo. Esta pesquisa, não causará nenhum tipo de risco para sua saúde. Ainda assim, você poderá desistir do estudo e/ou retirar seu consentimento a qualquer momento, ligando para qualquer um dos

telefones citados. Queremos ainda deixar claro que, caso você decida não participar, não haverá nenhum prejuízo no seu atendimento ou no seu tratamento.

Pelo presente termo de consentimento livre esclarecido declaro que autorizo a minha participação nesta pesquisa, pois fui informado (a) de forma clara, detalhada, livre de qualquer forma de constrangimento e manipulação quanto aos aspectos referentes a esta pesquisa.

Nome do participante: _____

Assinatura:_____

Data:_____

Nome do pesquisador:_____

Assinatura e carimbo:_____

Data:_____

Observação: o presente documento, baseado no item IV das Diretrizes e Normas Regulamentadoras para a Pesquisa em Saúde, do Conselho Nacional de Saúde (Resolução 196/96), será assinado em duas vias, de igual teor, ficando uma via em poder do participante e a outra com o(a) pesquisador(a) responsável.

Anexo 3: Índice de Religiosidade da Duke

Código do Paciente:_____

(1) Com que frequência você vai a uma igreja, templo ou outro encontro religioso?

1. Mais do que uma vez por semana
2. Uma vez por semana
3. Duas a três vezes por mês
4. Algumas vezes por ano
5. Uma vez por ano ou menos
6. Nunca

(2) Com que frequência você dedica o seu tempo a atividades religiosas individuais, como preces, rezas, meditações, leitura da bíblia ou de outros textos religiosos?

1. Mais do que uma vez ao dia
2. Diariamente
3. Duas ou mais vezes por semana
4. Uma vez por semana
5. Poucas vezes por mês
6. Raramente ou nunca

A seção seguinte contém três frases a respeito de crenças ou experiências religiosas. Por favor, anote o quanto cada frase se aplica a você.

(3) Em minha vida, eu sinto a presença de Deus (ou do Espírito Santo).

1. Totalmente verdade para mim
2. Em geral é verdade
3. Não estou certo
4. Em geral não é verdade
5. Não é verdade

(4) As minhas crenças religiosas estão realmente por trás de toda a minha maneira de viver.

1. Totalmente verdade para mim
2. Em geral é verdade
3. Não estou certo
4. Em geral não é verdade
5. Não é verdade

(5) Eu me esforço muito para viver a minha religião em todos os aspectos da vida.

1. Totalmente verdade para mim
2. Em geral é verdade
3. Não estou certo
4. Em geral não é verdade
5. Não é verdade

Anexo 4: Escala de avaliação do bem-estar espiritual: FACIT-Sp-12 (versão 4)

Código do Paciente:_____

BEM-ESTAR ESPITITUAL (*FACIT_Sp-12*)

Por favor, faça um círculo em torno do número que melhor corresponda ao seu estado durante os últimos 7 dias.

	PREOCUPAÇÕES ADICIONAIS	Nem um pouco	Um pouco	Mais Ou menos	Muito	Muitíssimo
Sp 1	Sinto-me em paz	0	1	2	3	4
Sp 2	Tenho uma razão para viver	0	1	2	3	4
Sp 3	A minha vida tem sido produtiva	0	1	2	3	4
Sp 4	Custa-me sentir paz de espírito	0	1	2	3	4
Sp 5	Sinto que a minha vida tem um propósito	0	1	2	3	4
Sp 6	Sou capaz de encontrar conforto dentro de mim mesmo(a)	0	1	2	3	4
Sp 7	Sinto-me em harmonia comigo mesmo(a)	0	1	2	3	4
Sp 8	Falta sentido e propósito em minha vida	0	1	2	3	4
Sp 9	Encontro conforto na minha fé ou crenças espirituais	0	1	2	3	4
Sp 10	A minha fé ou crenças espirituais dão-me força	0	1	2	3	4
Sp 11	A minha doença tem fortalecido a minha fé ou crenças espirituais	0	1	2	3	4
Sp 12	Independentemente do que acontecer com a minha doença, tudo acabará em bem	0	1	2	3	4

ANEXO 5: Normas das revistas científicas

Nome da Revista: Journal of Religion and Health

Journal of Religion and Health

Manuscript Submission
Manuscripts, in English, should be submitted to the Editor-in-Chief via the journal's web-based online manuscript submission and peer-review system: http://jorh.edmgr.com
Inquiries regarding journal policy, manuscript preparation, and other such general topics should be sent to the Editor-in-Chief:
Curtis W. Hart, M.Div.
Editor-in-Chief, Journal of Religion and Health
e-mail: cuh9001@med.cornell.edu
Tel.: (347) 752-7421
The online system offers easy straightforward log-in and submission; supports a wide range of submission file formats [such as Word, WordPerfect, RTF, TXT, and LaTeX for manuscripts; TIFF, GIF, JPEG, EPS, PPT, and Postscript for figures (artwork)]; eliminates the need to submit manuscripts as hard-copy printouts, disks, and/or e-mail attachments; enables real-time tracking of manuscript status by author; and provides help should authors experience any submission difficulties.
Manuscripts should be checked for content and style (correct spelling, punctuation, and grammar; accuracy and consistency in citation of figures, tables, and references; stylistic uniformity of entries in the References section; etc.), as the typesetter is instructed to follow (accepted) manuscripts as presented. Page proofs are sent to the designated author for proofreading and checking. Typographical errors are corrected; authors' alterations are not allowed.
Books for review and inquiries about book reviews should be sent to the Editor-in-Chief at the above address.

- www.jorh.edmgr.com

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Submission is a representation that the manuscript has not been published previously and is not currently under consideration for publication elsewhere. A statement transferring copyright from the authors (or their employers, if they hold the copyright) to Springer Science+Business Media, LLC is required. Upon commencement of typesetting, the contact author will receive an e-mail directing him/her to a webpage where the transfer-of-copyright form can be signed online. Such a written transfer of copyright, which previously was assumed to be implicit in the act of submitting a manuscript, is necessary under the U.S. Copyright Law in order for the publisher to carry through the dissemination of research results and reviews as widely and effectively as possible.

Manuscript Style

Type double-spaced using generous margins on all sides, The entire manuscript, including quotations, references, figure-caption list, and tables, should be double-spaced. Manuscript length, except under unusual circumstances, should not exceed 25 double-spaced pages. Number all pages consecutively with Arabic numerals, with the title page being 1. In order to facilitate masked (previously termed "double-blind") review, leave all identifying information off the manuscript, including the title page and the electronic file name. Appropriate identifying information is attached automatically to the electronic file. Upon initial submission, the title page should include only the title of the article.

An additional title page is to be uploaded as a separate submission item and should include the title of the article, author's name (with degree), and author's affiliation. Academic affiliations of all authors should be included. The affiliation should comprise the department, institution (usually university or company), city, and state (or nation) and should be typed as a footnote to the author's name. The title page should also include the complete mailing address, telephone number, fax number, and e-mail address of the one author designated to review proofs. A brief autobiographical paragraph, preferably no longer than 100 words, that includes highest degree, academic affiliation, expertise, projects, etc. (in that order) should be included on the title page.

An abstract is to be provided, preferably no longer than 100 words.

The names, institutional affiliations, and e-mail addresses of three (or more) suggested potential reviewers should be included on the additional title page.

A list of 3–5 key words is to be provided directly below the abstract. Key words should express the precise content of the manuscript, as they are used for indexing purposes.

CONFIDENTIAL MATERIAL

If your article contains any reference to material obtained under the HIPPA regulations regarding the use of Protected Health Information(PHI), to guarantee the privacy and confidentiality of this information, the author is required to do the following to be in compliance with HIPPA regulations:

1. Obtain from the subject(s) a signed and dated Release of Information Form which states explicitly that the subject(s) is giving his/her informed consent to have his/her Protected Health Information published in the Journal of Religion and Health. This form should include the title of the article to be published and should contain the original signature of the subject(s) and it should remain securely contained in the author’s possession in perpetuity.
2. Submit to the Editor-in-Chief of the Journal of Religion and Health an Authorization Form to be obtained from the Editor-in-Chief with the original signature of the author, indicating that the author has the permission of the subject(s) to publish his/her material and authorizing the Journal of Religion and Health to publish the article in compliance with HIPPA regulations regarding Protected Health Information. This form will also be signed by the Editor-in-Chief of the Journal of Religion and Health and the original form will be placed in a locked file under the auspices of the Editor-in-Chief in perpetuity. A copy of this form will be mailed to the author for his/her files in an envelope marked: “Personal and Confidential” .

3. The author will make every effort to protect the identity of the subject by using pseudonyms, and changing any information that might make it possible for the reader to identify the subject. This would include any illustrations, including photographs, that might reveal the subject's identity.

Illustrations
Illustrations (photographs, drawings, diagrams, and charts) are to be numbered in one consecutive series of Arabic numerals and cited in numerical order in the text. Photographs should be high-contrast and drawings should be dark, sharp, and clear. Artwork for each figure should be provided on a separate page. Each figure should have an accompanying caption. The captions for illustrations should be listed on a separate page.
Tables should be numbered (with Arabic numerals) and referred to by number in the text. Each table should be typed on a separate page. Center the title above the table, and type explanatory footnotes (indicated by superscript lowercase letters) below the table.

References
List references alphabetically at the end of the paper and refer to them in the text by name and year in parentheses. References should include (in this order): last names and initials of all authors, year published, title of article, name of publication, volume number, and inclusive pages. The style and punctuation of the references should conform to strict APA style–illustrated by the following examples:
Journal Article
Plante, T. G., & Aldridge, A. (2005). Psychological patterns among Roman Catholic clergy accused of sexual misconduct. Pastoral Psychology, 54, 73–80.
Book
Levin, J. (2002). God, faith and health: Exploring the spirituality–healing connection. New York: Wiley.
Contribution to a Book
Cutler, D. L., Bigelow, D., Collins, V., Jackson, C., & Field, G. (2002). Why are severely mentally ill persons in jail and prison? In P. Backlar & D. L. Cutler (Eds.), Ethics in community mental health care: Commonplace concerns (pp. 137–154). New York: Kluwer Academic/Plenum Publishers.

Footnotes
Footnotes should be avoided. When their use is absolutely necessary, footnotes should be numbered consecutively using Arabic numerals and should be typed at the bottom
of the page to which they refer. Place a line above the footnote, so that it is set off from the text. Use the appropriate superscript numeral for citation in the text. In general, the journal follows the recommendations of the 2009 Publication Manual of the American Psychological Association (Sixth Edition), and it is suggested that contributors refer to this publication.

No Page Charges
The journal makes no page charges. Reprints are available to authors. Upon commencement of typesetting, the contact author will receive an e-mail directing him/her to a webpage that provides reprint ordering information, including the current price schedule, and where reprints can be ordered online.

English Language Editing

For editors and reviewers to accurately assess the work presented in your manuscript you need to ensure the English language is of sufficient quality to be understood. If you need help with writing in English you should consider:

- Asking a colleague who is a native English speaker to review your manuscript for clarity.
- Visiting the English language tutorial which covers the common mistakes when writing in English.
- Using a professional language editing service where editors will improve the English to ensure that your meaning is clear and identify problems that require your review. Two such services are provided by our affiliates Nature Research Editing Service and American Journal Experts. Springer authors are entitled to a 10% discount on their first submission to either of these services, simply follow the links below.
  - English language tutorial
  - Nature Research Editing Service
  - American Journal Experts

Please note that the use of a language editing service is not a requirement for publication in this journal and does not imply or guarantee that the article will be selected for peer review or accepted.

If your manuscript is accepted it will be checked by our copyeditors for spelling and formal style before publication.

Nome da Revista: *Respiratory Physiology & Neurobiology*

Guide for Authors

Introduction

Respiratory Physiology & Neurobiology publishes original articles and invited reviews concerning the field of respiration in its broadest sense. Although a special focus is on topics in neurobiology, high quality papers in respiratory molecular and cellular biology are also welcome, as are high quality papers in traditional areas, such as mechanics of breathing; gas exchange in lungs, gills, skin, and tissues; acid-base balance; respiration at rest and exercise; respiration in normal and unusual conditions, like high or low pressure or changes of temperature, low ambient oxygen; embryonic and adult respiration; comparative respiratory physiology. Papers on clinical aspects, articles on original methods, as well as theoretical papers are also considered as long as they foster the understanding of respiratory physiology.

1. The manuscript must contain the following sections, each starting on a new page:

- Title page
- Abstract
- Main text
- References
- Figure legends (if any)

2. The following items must be uploaded as separate files and in this sequence:

- Cover letter
- Abstract (in addition to the Abstract contained in the main text file)
- Rebuttal Notes (only for revised manuscripts)
- Highlights
- Graphical Abstract (optional)
- Manuscript
- Figures (if any)
- Tables (if any)

All figures must be prepared with all component panels in the same layout as in which they are to be printed.

Types of paper
Original Research Articles submitted to Respir. Physiol. Neurobiol. should deal with original research which has not been published previously, nor is being considered for publication elsewhere.

Short communications provide a rapid publication for short, concise papers dealing with original material within the scope of the journal. Short communications should not exceed 4 printed pages (about 8 manuscript pages), including up to 2 Figures, 1 Table and up to 10 References. Style of the manuscripts must otherwise conform with that of Original Research Articles (see below) and must, in particular, have an Abstract. The e-mail, telephone and fax number of the corresponding author must be given on the title page.

Frontiers Reviews are state-of-the-art reviews, prepared on invitation.

Book reviews are also prepared on invitation.

Letters to the Editor should only be submitted after consultation with the Editor

Commentaries are invited by the Editor, but all reviewers are encouraged to propose any accepted manuscript for a formal Commentary.

Contact details for submission
Papers should be submitted via the journal's Elsevier Editorial System site .

Submission checklist

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:
• E-mail address
• Full postal address

All necessary files have been uploaded:
Manuscript:
• Include keywords
• All figures (include relevant captions)
• All tables (including titles, description, footnotes)
• Ensure all figure and table citations in the text match the files provided
• Indicate clearly if color should be used for any figures in print
Graphical Abstracts / Highlights files (where applicable)
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