

Qigong, obesity, and immunity dynamics and its application to long COVID-19 syndrome

Abstract

COVID-19, an acute respiratory condition resulting in high rates of excess mortality, particularly among adults in later life remains challenging to prevent uniformly and is now found to induce a series of long term adverse health impacts termed 'long COVID' syndrome. But can more be done to avert the risk of COVID-19 and its observed long term impact in older adults? This mini review strove to examine, summarize and synthesize the research base concerning the key risk factors underpinning later life acquisition of COVID-19 and whether an ancient mind body technique known as Qigong may be one possible largely overlooked strategy for promoting immunity and minimizing the related health correlate of obesity that can both raise the risk for severe COVID-19 infections and delay its recovery among older adult survivors. A second was to provide related intervention directives for health professionals working or who are likely to work with this vulnerable population in the future. Using the **PUBMED** and other leading electronic data bases and the key words: Qigong, Immunity, COVID-19, Long COVID-19, Obesity, Older Adults, a fair number of articles indicate that the practice of Qigong may be very useful as an adjunctive intervention strategy for raising immunity levels and fostering weight control among older adults, especially those survivors suffering from long COVID syndrome who remain at risk for second infections.

Keywords: COVID-19, immunity, intervention, long COVID, obesity, prevention, Qigong

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Introduction

COVID-19, an acute respiratory and infectious condition causing extensive physical and mental health challenges and distress, even among those vaccinated, including many survivors who continue to experience multiple long term adverse health symptoms, known as 'long COVID' is especially prevalent in older adults and others who were overweight before they became ill or become overweight after that.¹⁻³

Although most of the current published articles on long COVID management and symptom issues focus on pulmonary health issues related to COVID-19 and its outcomes,² physical activity, often recommended for purposes of promoting general health and well-being among older adults in general, as well as for weight control in general, is also currently advocated for fostering long COVID recovery, among other approaches based on the individual's health profile and needs.³ However, in the face of the presence of age associated cardiopulmonary disease, as well as COVID long term bouts of breathlessness, and cardiovascular condition flares, pain and feeling weak, helpless, and anxious, it is clear, recommendations to undertake regular or traditional forms of physical activity or exercise might fail if these are ill considered in light of any pulmonary as well as prevailing joint or muscle pain, and possibly stress that can negatively impact the immune system. Moreover, older adults suffering from one or more post-acute COVID symptoms, and who experience associated sleep disturbances may also be expected to have decreases in immune system function, physical endurance and strength, lingering bouts of fatigue, and suboptimal cardiovascular health.⁴

Since no effective antidote to COVID-19 syndrome with its possible prolonged period of multiple systems dysfunction and that has been found in sizeable numbers of older adult COVID-19 survivors exists despite vaccination usage,⁵ this review specifically examines the results of research concerning the projected impact, efficacy and effectiveness

of Qigong as a possible safe and efficacious mind body approach for advancing the immunity of older adults who are vulnerable to COVID-19 or have been discharged from the hospital or are recovering at home from an acute bout of COVID-19,⁶ as well as for possibly speeding up and maximizing COVID recovery processes and protection against subsequent infections. A focus on obesity associated factors was also examined given that emergent data pinpoint a strong interacting role for this oftentimes damaging health state in the context of COVID-19 risk and recovery,^{5,7} and that may have a bearing on vaccine efficacy and recovery efforts in the face of any weight stigma.⁸

Methods

To obtain the desired data, the predominant electronic data source applied was **PUBMED**. The years searched ranged from January 1 2020-January 20 2023 using the key words, **COVID-19, Immunity, Long COVID, Obesity, Older Adults, and Qigong**, although background classic data were also considered if supportive of fostering a better Qigong understanding. All modes of study and reports were deemed acceptable if they addressed one of the topical issues examined in this mini review. All forms of Qigong were deemed acceptable and the term COVID or COVID-19 was applied to represent all forms of the SARS-COV-2 coronavirus 19 [COVID-19], including its variants. Excluded were articles that did not embrace the key themes of this mini review, were non English, and research proposals. Only a narrative overview is provided as this topic as a whole is an emergent, rather than a well-established one, and many differing rather than uniform observations and approaches as well as samples studied prevail.

Search results

Hundreds, if not thousands of articles now attest to the challenges of averting COVID-19 infections, especially among older adults, and those who exhibit obesity states in particular due to obesity associated inflammatory impacts on immune cells and others, as well as on health

status in general, including mobility status.⁵ Obesity, a disease in its own right, is also found to be among the most salient accompanying health conditions that occur in the form of 'long' COVID symptoms of adverse health among COVID survivors who are in the high age categories.⁹

According to Bornstein et al.¹⁰ up to 40 percent of persons infected with SARS-CoV-2 are found to suffer from clinically relevant symptoms of long-COVID syndrome including chronic fatigue, breathlessness, and various cognitive symptoms. Initial studies have specifically shown people considered overweight along with those who have diabetes type II have a higher risk of developing long-COVID associated symptoms than healthy controls.

Not surprisingly, a current review of 44 eligible studies from 18 countries around the world has revealed that obesity increases the risk of severe COVID-19 complications, as well as an intensive care need, intubation and mortality rates. In addition, those acute COVID-19 cases with a higher than desirable body mass index appeared more vulnerable to acquiring a COVID-19 infection, as well as experiencing a more severe illness trajectory than the non obese¹¹ with longer hospital based stays, plus immune system dysfunction or deregulation in cases deemed to present with metabolically 'unhealthy' obesity levels, plus reduced long term COVID-19 vaccine efficacy, and a poorer than desired long term post-COVID health prognosis.¹²⁻¹⁴

As per Bornstein et al.¹⁰ there can thus be no question that it is thus vital to address COVID determinants such as excess body weight that are amenable to improvements or mitigation, at all stages of the disease, and to prevent this health state from worsening during recovery. Preventing the COVID infection in the first instance is of course paramount here, given the observation that repeated treatments of acute bouts of COVID-19 and any ensuing long-COVID with steroids that is exacerbated in the face of obesity, can undoubtedly contribute to inducing or exacerbating long-term metabolic and endocrine related disturbances, even if the COVID infected individual was initially healthy.¹³ Advocated in this regard is a structured program with rehabilitation and physical activity as well as optimal dietary management and inflammation control. Indeed, in the face of no well-defined medical model for managing long COVID, or preventing acute COVID, older adults who are vulnerable to being overweight or are already obese may be assisted in their recovery to optimal wellbeing via a combination of physical activity approaches as well as efforts to optimize mental health.¹¹

As outlined by Feng et al.⁶ while not well studied in the West, Qigong and its many variants are exercises that have been used to promote health for more than 5000 years with generally favourable results relevant to long COVID recovery in particular, as well as secondary COVID infections. This ancient component of traditional Chinese Medicine,^{15,16} which involves a series of breathing exercises,¹⁷ as well as meditation, and gentle body movements to achieve its aims,¹⁵ and is designed to help the individual to relax the mind and level of excess stress,¹⁸ thus setting the stage for intrinsic healing opportunities and possibly diminishing any prevailing inflammatory responses,¹⁹ and feelings of psychological distress may be of immense benefit in consideration of the fatigue, 'brain fog' symptoms, breathing challenges, and pain that are found in long COVID cases and that are hard to treat in the medical model alone. While not a substitute for standard medical management or public health recommendations for mitigating COVID-19,²⁰ based on the known features of long COVID and the lack of any specific cure for this, and the idea that improving the flow of energy through the body can influence health status and is found to be health affirming among older adults in multiple dimensions,²¹⁻²⁴ it seems possible that its thoughtful application may yet benefit COVID-19 cases who complain of excess fatigue,²⁴

and inefficiencies in upper thoracic breathing as well as anxiety, while improving immunity,²⁵ peace of mind,^{18,26} and movement ability that can enhance caloric expenditure in the case of the overweight older adult. Performing these exercises may also help to impact their immune systems favourably,²⁷ especially if the individual is confined to their bed or has limited physical capacity and is vulnerable to the risks of COVID vaccination.^{15,16}

Other benefits, especially for those suffering long COVID may include improvements in respiratory function,²⁸ COVID-19 convalescence,²⁹ attention, brain processing, and overall cognitive capacity,³⁰ possible reductions in required medications, and greater health benefits than medication alone.^{31,32} As well, substantive improvements in physical as well as emotional wellbeing that may foster a more rapid post-acute COVID recovery as well as greater protection against subsequent COVID-19 infections and hospitalizations, as well as its key risk factor, namely overweight status and poor cardiovascular health, especially among women may emerge.^{21,33-35}

A case report by Patel et al.³⁶ of a patient with pre-existing conditions of obesity, and other health issues who was initially diagnosed with COVID-19 with symptoms of acute breathing difficulties, dizziness, a persistent cough, headache, chills, fever, and sore throat and later diagnosed with long-haul COVID-19 with symptoms of breathlessness, fatigue, and dizziness on exertion plus gastrointestinal distress was helped objectively after pursuing Qigong type exercises. That is, after the patient practiced Tai Chi and Qigong three to four times a week for about half an hour, the patient experienced decreases in resting heart rate and weight and an increase in oxygen saturation level from 83% to 96%, indicating the exercises may have the potential to restore lung function, among other favorable health attributes. This approach described by Patel et al.³⁶ and others does appear to hold high promise given that sufficient research exists to show a higher incidence of inflammation-associated chronic disease and greater susceptibility to infection occur in the obese person, and that immunological processes that regulate obesity and can be improved may yield new treatments for obesity-associated disorders, such as COVID-19.³⁷

In sum, Qigong, a method of carrying out gentle movements and meditation and designed to increase well-being may help to strengthen the body's immune system and brain activity,³⁸ diminish pain, and promote self-healing,^{39,40} among practicing older adults with both acute COVID as well as post-acute COVID symptoms, and the presence of or exacerbation of obesity due to unrelieved pain and fatigue where exercise is deemed too challenging.

Lee et al.⁴¹ who investigated the influence of two acute Qigong interventions (Qi-training and Qi-therapy) on immune cells showed there were significant increases in lymphocytes 2 hours after actual but not sham Qi-training and a reduction in Natural Killer cell numbers Actual Qi-therapy, but not sham therapy, increased monocyte numbers immediately after the therapy, all possible benefits that would be meaningful in COVID-19 mitigation attempts.

In terms of both optimizing the older adult's health status in general, before or after COVID illness, Vera et al.¹⁵ similarly found positive immune responses to emerge after one month among an experimental group of subjects, but not among the control group. In this randomized study experimental subjects carried out these exercises on a daily basis if possible for one month, whereas control subjects performed their usual routines. Each movement carried out by the experimental subjects was repeated six times and involved a focus on breathing. An instructor guided the practice formally three times a week in a group, thus whether this approach would work in the home was not clear, but among those older adults who can carry out this form of exercise in their homes, they

may be expected to show cardiology associated preventive impacts.²⁵ In addition, improvements in diabetes presentation and central obesity are possible favourable attributes of the various forms of Qigong practices.²²

Fatigue too may be impacted successfully,⁴² among cases suffering from chronic fatigue syndrome who participate in Qigong that may be helpful to some older adults who have survived an acute COVID-19 bout of infection, but remain impaired in multiple respects.^{43–46} Qigong practices may also help reduce bouts of anxiety and depression, problems found to be uniformly present in most long COVID sufferers, as well as older adults, and those with obesity challenges, and may encourage more motivation for daily physical activities and self-care, plus feeling of self-control as a result.

Pórola et al.¹⁹ who aimed to study changes in the expression of genes associated with cellular stress response in peripheral mononuclear blood cells in healthy women before and after a 4 day Qigong training program found results that implied an associated reduction in the inflammatory and intensified anti-inflammatory gene expression post Qigong. As per Holder et al.⁵ this observation if pursued, may be of high value given that among older adults who exhibit a state of obesity may also be expected to exhibit an associated elevation in their inflammatory state and that can cause defects in immune system cell functioning that lower the body's ability to respond effectively to viral infections. This interaction between the state of obesity, immune cell status, and viral susceptibility, is also stated to alter mitochondrial activities in those host cells infected by COVID-19, and to thereby possibly exacerbate an array of psychological and physical symptoms that may well be averted or mitigated through Qigong practices (Table 1).⁴⁷

Table 1 Specific Outcomes of Qigong that Might Improve COVID-19 Immunity and Reduce Obesity-associated Correlates

Improvements in-	
i.	aerobic capacity and energy
ii.	anxiety states
iii.	blood pressure control
iv.	breathing
v.	fitness
vi.	functional ability
vii.	general health status
viii.	glucose control
ix.	immune function
x.	mental health
xi.	mood state
xii.	muscle strength
xiii.	muscle tone
xiv.	pain threshold
xv.	sleep quality
xvi.	stress levels
xvii.	weight control

Adapted from citations ^{6,22,26,48–58}

Discussion

Although many articles have been published since December 2019 highlighting the epidemiology and prevention of COVID-19, only limited success to date has been realized as far as decreasing the risk of the older overweight adult for severe COVID-19 disease, and if they survive for a prolonged post-acute state of multiple negative health symptoms. Since pharmacologic and public health isolation approaches are often limited or found to impact health negatively rather than favorably, a growing evidence base suggests low risk

alternative approaches such as more exposure to exercise may be helpful in multiple ways. Moreover, if the older adult finds a mode of exercising that is not stressful and is willing to adhere to this, multiple physical and cognitive benefits, as well as immune system status may be favorably amplified.

In this regard, a mind body approach practiced for many centuries in Asia, and termed Qigong offers a low intensity exercise approach that includes slow graceful, low impact, low velocity movements that may promote both physiological and psychological health, coherent breathing, while reducing negative affective states such as depressive symptoms. Its application may enhance pulmonary recovery and reduce stress that may accompany mild-moderate COVID-19 survival periods.⁴⁸ Importantly, Qigong, a diverse set of exercises including breathing exercises, does appear to have the ability to enhance functional capacity plus overall wellbeing even when only practiced for short periods of time. The practice of one or more Qigong forms may also help an older adult who is in pain or feeling exhausted to still undertake a modified form of Qigong that may help avert excess weight gain over the course of time and especially when if they are recuperating from acute COVID-19 or are exposed to various degrees of social services reduction, and possible social isolation adverse health impacts.⁴⁹

Research also shows Qigong is cost effective, safe to implement,⁵⁰ and as well as being gentle. The recommended exercises are easy to follow and available at no cost on many internet sites, and can be carried out in diverse postural positions. Since they are easy to follow and require no equipment and do appear to be accompanied by desirable health benefits both physical and psychological,²³ it appears Qigong can be advocated for most older adults who are susceptible to COVID-19 or are recovering from COVID-19 even if they are bed ridden, and regardless of age or extent of underlying any physical disability. Additionally, this form of therapy appears to be sufficiently flexible to accommodate different people's preferences for exercise quite successfully, given its many different approaches and has a favorable impact on psycho-immune homeostasis that can possibly strengthen the body's resistance against secondary COVID infections.⁴⁸

The application of Qigong may also help to reduce stress in addition to promoting important physical and mental health benefits that are likely to foster independence and wellbeing and as mentioned to allay over eating practices, as well as sedentary lifestyle adoption.

Qigong may also help to attain the major role of mind-body fitness among obese older adults as far as improving their muscle control mechanisms, body functionality, flexibility, and balance while reducing any physical limitations, chronic pain, and stress through multiple sessions that involve the integration of body postures, efficient breathing patterns, meditation, and relaxation. Qigong training performed with the video-conference method or asynchronous videos also appears well tolerated, and feasible in physically inactive adults who would benefit from increases in the ability to function physically and with fewer cardio-metabolic distress signs, as well as mental health factors that now appear to consistently accompany long COVID syndrome manifestations.⁵¹ Although its impact on body composition remains in question, there may also be associated Qigong associated glucose regulation improvements and quite rapid health indicators of blood pressure and mood that have a bearing on the presence of one or more post COVID symptoms and their intensity and duration, as well as having positive impacts on inflammation, immune function, plus obesity, that warrant consideration and more study.^{52–59,60}

However, to more ably demonstrate the specific benefits of Qigong relative to other forms of physical activity participation as far as improving weight status and overall health and protection in general in the case of the older overweight adult who is at high relative risk of acquiring COVID-19 and/or prolonged post-COVID symptoms, more careful long term well-designed research is strongly indicated.

Conclusion

Although the literature on the application of Qigong as a clinically viable adjunct for protecting the health and immune status of the older adult is very limited, and its validity and generalizability can be questioned, in light of the magnitude of the immense public health burden associated with COVID-19 and the likelihood of this increasing—rather than decreasing as society ages—and COVID-variants that are vaccine resistant emerge, the finding of no short-term detrimental effects post-Qigong participation on the immune system, or on the challenges of excess weight presence, but rather beneficial outcomes, should be explored further. To this end, well-designed studies of separate degrees of COVID severity, as well as weight status and health extent, and methods of applying Qigong that can be employed independently by older adults will be helpful in all likelihood. Studies that examine the interacting mechanisms underlying the observed benefits of Qigong, for example the possible influence the modality might have on the nature of the participant's cognitive status and sleep quality as this affects weight control efforts may also be highly revealing. What forms of Qigong yield optimal results, and whether Qigong exercises can minimize diabetes and cardiovascular health conditions, as well as pain that can foster a sedentary lifestyle among older adults with a COVID-19 history would also be of great interest to examine, as would its impact on inflammation found in obesity states.

The fact that the movements involved aim to protect internal organs from harm, and are performed more slowly than more Westernized exercises, and involve thinking and concentration, and breathing exercises, may yet provide a unique approach to reducing both fatigue and pain, as well as depression and anxiety and breathlessness and poor exercise tolerance post COVID.

As such, it appears professionals in the health field working with older adults can safely recommend Qigong type exercises to most aging adults with the expectation they benefit the individual in multiple health protective ways that are relevant to reducing COVID-19 mortality and morbidity rates, including issues of overweight, inflammation, and immune system dysfunction.

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Conflicts of interest

The author declares no conflicts of interest.

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