

Multimorbidity and Health-Related Quality of Life among Older Adults

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Short Communication

Multimorbidity, the co-occurrence of two or more chronic conditions in an individual [1], has been one of the most complex phenomena that has challenged healthcare systems around the world in recent times. This complex phenomenon is at times considered as synonymous to comorbidity. There are also authors who conceptualize multimorbidity as referring to any combination of chronic conditions without identifying an index disease and comorbidity as referring to cases where one of the conditions is recognized as an index condition [2].

Multimorbidity affects all age groups but geriatric focus in epidemiological and health services research is distinctively evident. This is to be expected given how widespread multimorbidity is among older adults. One study estimated that a single chronic condition is present only among 23 percent of 65-74 year olds but multimorbidity is present among 59% of older adults in the same age bracket [3]. The proportion of people with multimorbidity is even greater when higher age brackets among older adults are considered, amounting to 76% among people 75 years of age and older. This is in contrast to the presence of multimorbidity in only 14% of 35-44 year olds [3].

Multimorbidity has been associated with several undesirable health outcomes including reductions in life expectancy [4], functional decline [5] and increases in the probability of adverse drug events [6]. The prevalence of multimorbidity involving physical chronic conditions only is similar among least and most socioeconomically deprived groups of older adults. In contrast, the prevalence of multimorbidity with a mix of physical and mental health conditions is higher among most socioeconomically deprived groups when compared to the least deprived ones [3]. Older adults with multimorbidity who are more likely to experience loss of physical functioning, develop mental health related issues and have difficulties with adherence to multiple medications [7] are the main users of healthcare. It is estimated that medical consultations are almost 4-fold and healthcare costs are 5.5 times higher among older adults with multimorbidity when compared to those without multimorbidity [8].

Older adults' ability to adapt to changes that come with aging and their efforts to self-manage may be challenged especially when they have multiple chronic conditions with competing demands [9]. Consider an older adult with chronic obstructive pulmonary disease (COPD) and type II diabetes. Their efforts to manage their diabetes

with life-style changes will most likely be hampered at times by COPD exacerbations. Older adults with a mix of physical and mental health multimorbidity may also face further barriers to self-manage and adhere to preventive and curative treatments prescribed. In general, patient-specific constellations of chronic conditions in multimorbidity becomes an important factor that sets boundaries for adaptation, active aging, self-management and adherence to preventive and curative treatments.

The current aging of the population globally and accelerated aging that is predicted in the coming decades [10] highlight the urgency of appropriate interventions that will reduce the impact multimorbidity has at individual, healthcare system and societal levels. Despite recent growth in multimorbidity research, advances in knowledge for developing and evaluating interventions is less than optimal partly due to the inherent difficulties in conducting research and generalizing results in multimorbidity. Given the importance of health-related quality of life (HRQoL) in the evaluation of interventions in multimorbidity, we will focus on this measure to help identify advances and gaps in knowledge.

Current studies on HRQoL among older adults with multimorbidity show that the quality of life decreases as the number of chronic conditions an older adult has increases. This result is consistent across studies that consider only a limited number of chronic conditions, some as low as 11 conditions [11], and those that incorporate a larger number of chronic conditions, one incorporating as high as 45 conditions [12]. The latter study which also derives weighted counts showed that severity should be an important consideration in HRQoL studies among those with multimorbidity.

Most of the current studies on HRQoL among older adults with multimorbidity use study designs that consider chronic conditions as the unit of analysis [11,13,14]. The lists of chronic conditions used in these studies are usually limited to those that are common among geriatric populations. In these studies, the focus is on the main effects of chronic conditions and synergistic effects of a selected number of pairs of conditions when all the conditions in the list are analyzed simultaneously. These studies show that most chronic conditions are associated with worsening of HRQoL with conditions such as stroke, depression, and anxiety accounting for the strongest associations [11,13].

In terms of the synergistic effects, a recent study examined two pairs of conditions (diabetes and coronary disorders, and stroke and

coronary disorders) and suggested that both combinations were associated with significantly worsening of HRQoL [13]. A second study that considered synergistic effects in a different set of two pairs of conditions found that the combined worsening effect of the first pair (diabetes and cataract) on HRQoL was barely significant [11]. In contrast, the combined effect of the second pair (asthma and COPD) in this study was significant but implied a dampening effect on HRQoL. A third study, where chronic conditions among older adults were aggregated into organ system groups, found no synergistic effects and concluded that chronic conditions aggregated into organ system groups affected HRQoL largely independently of each other [14].

While these studies provide helpful insights about associations between multimorbidity and HRQoL, more studies are needed to enhance our understanding of the relationships between multimorbidity and HRQoL. These new studies should consider novel designs where different patterns of unique constellations of chronic conditions in older adults are regarded as the unit of analysis rather than a chronic conditions list that captures conditions that are most prevalent among geriatric populations. The choice of the varying patterns of chronic condition combinations that are prevalent among older adults as the unit of analysis will align HRQoL analysis with the patient-centered approaches where person-centered care is promoted. This approach will shift the emphasis away from the study of synergistic effects of a limited number of pairs of chronic conditions that are technically feasible within the current study designs. It will help in taking into consideration different patterns of multimorbidity including triplets and higher order combinations of chronic conditions in studying HRQoL. Studies have shown that the co-occurrence of three or more chronic conditions in older adults is common [15,16] but there are no current studies exploring the effects, for example, of most prevalent triplets or higher order combinations of chronic conditions on HRQoL. Studies that consider the effects the crude number of chronic conditions co-occurring in an individual have on HRQoL show that the effects of multimorbidity as triplets or higher order combinations may be much more substantial than the one implied by multimorbidity as pairs [11].

A current study stresses some of the standardizations that need to occur in the field of multimorbidity in order to achieve HRQoL measures that are consistent across studies [17]. This study relied on HRQoL and multimorbidity data collected from the same patient population. The aim of the study was to explore if non-standardization in the definition of multimorbidity and the use of different number and types of chronic conditions will affect the magnitude of the relationship between multimorbidity and HRQoL. To this end, the study used two different definitions of multimorbidity (presence of two or more conditions versus three or more conditions) and two sets of pre-defined chronic condition lists (21 conditions versus 6 conditions) with data from the same patient population. This study showed that different measures of multimorbidity applied to the same data resulted in wide variations in the estimate of association between HRQoL and multimorbidity. One of the implications of this study is that HRQoL studies in multimorbidity will benefit from a standardized multimorbidity definition that may be reached through consensus building among multimorbidity research community. Further, given the impact the number and the type of chronic conditions incorporated have on findings from HRQoL studies, new studies should consider the universe of chronic conditions instead of a subset.

The new HRQoL studies about multimorbidity should also take into consideration all of the important confounding factors in their study

designs. While studies account for factors such as age, sex, education and income, there are other factors such as disability and frailty that are common among geriatric populations that have not been considered in HRQoL studies. One recent study estimated that more than one-third of the geriatric population with multimorbidity has disability and/or frailty [18]. More studies are needed to understand what proportion of the disability and/or frailty among geriatric populations with multimorbidity is due to reasons other than the co-occurrence of chronic conditions. These studies will help clarify if disability and/or frailty is an important confounding factor or how new study designs could be used to account for possible endogeneity in this area.

Multimorbidity continues to challenge the research community at several levels. Recent studies about the association between multimorbidity and HRQoL have started to provide initial insights about the complexities involved in developing a better understanding about the topic. Further studies that try to use novel techniques in coping with these complexities and rely on standardized measures of multimorbidity may lead the way to a more comprehensive understanding of its relationships with HRQoL.

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