



April 2022

A Conceptual Framework: Life Course Health Development and Partial Hand Loss

Alison L. Johnson

Western New England University – USA, alison.johnson@wne.edu

Follow this and additional works at: <https://scholarworks.wmich.edu/ojot>



Part of the Occupational Therapy Commons

Recommended Citation

Johnson, A. L. (2022). A Conceptual Framework: Life Course Health Development and Partial Hand Loss. *The Open Journal of Occupational Therapy*, 10(2), 1-8. <https://doi.org/10.15453/2168-6408.1871>

This document has been accepted for inclusion in The Open Journal of Occupational Therapy by the editors. Free, open access is provided by ScholarWorks at WMU. For more information, please contact wmu-scholarworks@wmich.edu.

A Conceptual Framework: Life Course Health Development and Partial Hand Loss

Abstract

Partial hand loss can be a profound source of disability with far-reaching economic and social consequences across the lifespan. Compared to other limb loss populations, perhaps surprisingly, the partial hand loss population experiences higher rates of whole-person impairment and disabling mental health conditions. Despite these known health disparities, the long-term health outcomes of the partial hand loss population are not adequately understood. Deepening understanding and preventing further disparity requires a multi-perspective approach examining factors contributing to health and well-being across the lifespan. This paper examines the partial hand loss population through two separate but overlapping lenses: population health and the life course approach. In addition, this paper presents an argument for the consideration of diverse perspectives and conceptual frameworks in the profession of occupational therapy. A case study is presented illustrating the clinical use of the Life Course Health Development (LCHD) framework as it relates to an individual with partial hand loss. Implications for occupational therapy and practice guidelines for integrating the LCHD framework are discussed.

Comments

The author declares that they have no competing financial, professional, or personal interest that might have influenced the performance or presentation of the work described in this manuscript.

Keywords

health disparities, social determinants, postmodern pluralism, population health, occupation

Cover Page Footnote

I wish to thank my supervisor and faculty mentor, Debra Latour, PP-OTD, M.Ed., OTR/L, for her assistance with reviewing and editing. This paper and the research behind it would not have been possible without her unwavering enthusiasm and exceptional support.

Credentials Display

Alison L. Johnson, OTD, OTR/L

Copyright transfer agreements are not obtained by The Open Journal of Occupational Therapy (OJOT). Reprint permission for this Guidelines for Practice and Technological Guidelines should be obtained from the corresponding author(s). [Click here to view our open access statement regarding user rights and distribution of this Guidelines for Practice and Technological Guidelines.](#)

DOI: 10.15453/2168-6408.1871

Occupational therapists play an important role in population health. According to Braveman (2016), population health encompasses the work occupational therapists do when they identify and address “the health needs of populations such as people with autism, diabetes, falls, limited mobility, or cancer” (p. 4). Individuals with rare conditions, such as partial hand loss, often experience disproportionate burdens of illness because of various individual and population-based factors (Nash et al., 2016). Partial hand loss is a significant source of disability affecting individuals across the lifespan with far-reaching economic and social consequences (Grob et al., 2008). The hand plays a vital role in occupational engagement, accounting for 90% of arm function (Treadwell, 2018). Among upper limb amputations, 94% occur distal to the wrist (Dillingham et al., 2002; Treadwell, 2018). Compared to other upper and lower limb loss levels, partial hand loss is associated with higher rates of whole-person impairment and disabling mental health conditions (Treadwell, 2018). Despite the known adverse health outcomes and relative frequency of partial hand loss, this population has been historically underserved (Lake, 2009). Until recently, research and prosthetic technology development have concentrated on higher levels of upper limb absence, consequently overlooking the unique needs of the partial hand loss population (Lake, 2009). Addressing the health of underserved populations, such as individuals with partial hand loss, requires a pluralistic approach that considers a wide range of health determinants occurring across an individual’s lifespan (Halfon et al., 2018).

Postmodern pluralism is a philosophy that embraces multiple ways of understanding the world (Hinojosa, 2017). Anne C. Mosey introduced the concept of pluralism in occupational therapy in her 1985 Eleanor Clarke Slagle Lecture. Mosey described pluralism as the acceptance and integration of multi-perspectives, each uniquely contributing to the profession’s base of knowledge. Mosey also introduced the concept of frames of reference as the foundation for applying the profession’s multidisciplinary theoretical guidelines (Mosey, 1970). Conceptual frameworks, such as Life Course Health Development (LCHD), discussed in this paper, act as vehicles for integrating new perspectives, thus deepening the understanding of health conditions at the individual and population levels. The LCHD framework acknowledges the influence of health determinants on developmental trajectories and demonstrates how gaps in care may contribute to health disparities for certain populations (Halfon et al., 2018; Pitonyak et al., 2020). Using the LCHD framework in practice can bring context and meaning when treating individuals with rare conditions that many occupational therapists may only see once throughout their careers. This paper provides an analysis of partial hand loss from a population health perspective and argues for the use of the LCHD framework to improve the rehabilitative experiences and outcomes for the partial hand loss population. Furthermore, this paper proposes integrating LCHD concepts into occupational therapy practice to support therapists working with individuals and populations with rare conditions.

Defining Health

To gain an understanding of LCHD as it relates to individuals with partial hand loss, health in this context should be defined. A multitude of factors influence health throughout an individual’s lifespan. Health behaviors, physical environments, and social and economic factors contribute to individual and population health and well-being (Pitonyak et al., 2020). The World Health Organization (WHO) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease” (World Health Organization, 2021, p. 1). This definition represents a departure from modernistic, science-driven, reductionist assumptions of health. Considering the influence of social determinants, including access to housing, education, health care, and healthy foods, the WHO’s definition mirrors a

philosophical shift away from modernism (Healthy People 2030, 2020). Postmodern pluralism counters the assumption that the human condition can be explained simply through science (Hinojosa, 2017). Hinojosa (2017) states, “postmodern philosophy is a response to the absolute acceptance of modernism’s scientific explanation that one reality is valid for all groups, cultures, traditions, or races. It focuses instead on the relative truth of each perspective” (p. 6). Applying this philosophy to health and well-being concepts embraces a definition of health rooted in multiple perspectives and influenced by diverse factors. Defining health on these terms has been influential in the growing paradigm shift of the U.S. health care system toward a multidisciplinary, patient-centered care delivery model (Badash et al., 2017).

Broadening the definition of health to include social systems and environmental contexts lends itself to adopting a population health perspective. Population health refers to “the distribution of health outcomes in a population, the health determinants that influence distribution of care, and the policies and interventions that affect the determinants” (Nash et al., 2021, p. 6). A population health perspective assumes that interactions between systems at the personal, community, and public policy levels influence health and well-being (Nash et al., 2021). Central to the principles of population health is the concept of health disparities. Health disparities are preventable differences in incidence, prevalence, mortality, and disease burden among population groups (Nash et al., 2021). Subpopulations based on socioeconomic status, education, age, race, and disability experience disproportionate burdens of illness with long-term, economic, and social consequences (Nash et al., 2021). Health disparities can be present early in life and have a compounding effect across the lifespan (Halfon et al., 2018). Preventing further disparity requires a life course approach involving stakeholders across diverse settings, including school, work, worship, and recreation (Latour, 2020).

Life Course Health Development

Life course focused research has been rapidly developing over the past decade, focusing on essential questions about how disease develops and the influence of early-life experiences on adult health and well-being (Burton-Jeangros et al., 2015; Halfon et al., 2018). Life course research is beginning to shape diverse stakeholders’ perspectives in the health care system and beyond. The LCHD framework aligns with the objectives of multidisciplinary, including occupational therapy, developmental psychology, sociology, neuroscience, population health, political science, and human capital focused economics (Halfon et al., 2018). Evidence has been building that links early life experiences with adult health conditions and provides impetus among health care providers to implement LCHD in the clinical setting (Burton-Jeangros et al., 2015; Halfon et al., 2018). Neal Halfon, the pioneer of life course-focused research, created the LCHD conceptual framework to explain formally how temporal events throughout an individual’s life influence health outcomes and how this knowledge can guide new approaches to policy and research (Halfon et al., 2018). The LCHD framework provides a more robust understanding of disease and explains how environmental, physical, and behavioral contexts influence risk factors and long-term health development trajectories (Halfon et al., 2018).

The LCHD framework recognizes the importance of time and context in understanding human development and population health outcomes (Lynch & Smith, 2005). Researchers have well established the relationship between low childhood socioeconomic status and the development of adverse adult health outcomes (Larson et al., 2018). Larson et al. (2018) cited a wide range of international epidemiological studies spanning multiple decades that have established associations between early life low socioeconomic status and adverse adult health conditions such as obesity, diabetes, cardiovascular disease, cognitive decline, functional limitation, and early mortality (Larson et al., 2018). Chronic health conditions

transcend human developmental stages and affect life course trajectories. Furthermore, the correlation between early-life exposure to adverse, traumatic events and later cognitive-behavioral, emotional, and somatic problems strengthens the argument that health is a continuum, spanning the life course (De Bellis & Zisk, 2014).

The LCHD framework has been applied to individuals and populations with chronic diseases. However, it is also applicable in the context of infectious diseases, traumatic injuries, and other health-related conditions occurring anytime throughout life (Halfon et al., 2018). Health status can change at any developmental stage, significantly altering the life course trajectory. Consider the partial hand loss population: Limb loss is associated with significant functional and psychosocial changes in an individual's life (Burger et al., 2007). Not only does this injury cause sudden alterations in anatomical structures, but the experience of trauma can also cause physiological and structural changes in the brain, resulting in developmental disruptions (De Bellis & Zisk, 2014). The loss of a limb extends well beyond the acute stages of recovery and has far-reaching economic, psychosocial, and physical health consequences (Burger et al., 2007). The LCHD framework emphasizes the influence of temporal and social factors on individuals and population health outcomes (World Health Organization, 2000). LCHD acknowledges the relevance of critical developmental stages starting with gestation and moving through late adulthood (Halfon et al., 2018). Developmental transitions or biological and psychosocial turning points that play an essential role in human development are also considered when using a life course model (Halfon et al., 2018; Jacob et al., 2017). Table 1 highlights stages of development across the lifespan that hold significance to individuals with acquired partial hand loss or congenital hand differences.

Table 1

Developmental Stages Significant to Partial Hand Absence

Age	Developmental Milestones
4 – 6 Months	Bimanual finger skills at midline Bimanual weight bearing and shifting Stabilizing toys
2 – 5 Years	Bimanual fine motor skills Independent toileting, dressing, and eating Social skills
13 – 16 Years	Physical growth and maturation Independence from parents Peers and social acceptance Entering workforce
18 – 21 Years	College/vocational training Living away from home for the first time
32 – 35 Years	Parenting and elderly caregiving Career building Overuse and secondary conditions
63 – 66 Years	Retirement and changes in income Role changes Overuse and secondary conditions
78 – 81 Years	Age-related changes in health status Loss of spouse/peers Environmental transitions Overuse and secondary conditions

Note. Coppard et al., 2020; Orentlicher et al., 2015.

Partial Hand Loss: A Population Analysis

Approximately two million Americans have experienced limb loss or congenital limb difference (Amputee Coalition of America, n.d.). The limb loss population is projected to grow significantly over the next 30 years, increasing the demand for effective short- and long-term rehabilitative interventions (Ziegler-Graham et al., 2008). The limb loss population can be divided into subgroups with distinct needs determined by various factors, including etiology and limb loss presentation. Upper limb loss among adults is primarily because of a traumatic event resulting in upper limb amputation (Fahrenkopf et al., 2018). The number of partial hand amputations outnumbers transradial amputations at a rate of 31:1 (Dillingham et al., 2002). High rates of partial hand loss are likely because of the vulnerability of anatomical location and frequency of use (Graham et al., 2021). Despite the large number of individuals experiencing partial hand loss, minimal research is available regarding this population's long-term outcomes (Whelan & Farley, 2018).

Hand function, including grasping, manipulating, and sensing objects, is fundamental to meaningful participation in activities of daily living (Latour, 2020). Hands are responsible for more than functional tasks; they aid in communication, express emotion, and are closely tied to self-image (Grob et al., 2008). A sudden and often traumatic loss of a limb causes an immediate reevaluation of functional abilities. Many everyday tasks that were once relatively easy to complete can present significant challenges post-injury, frequently resulting in decreased participation and quality of life (Burger et al., 2007). Diminished self-image and low self-efficacy are common among the partial hand population, and negatively affects social participation, community involvement, and return to work outcomes (Burger et al., 2007). The economic implications of partial hand loss are significant, with far-reaching and long-term consequences for both individuals and communities (Graham et al., 2021). Research exploring return to work outcomes for the partial hand loss population suggests that psychosocial factors play a significant role in one's ability to return to gainful employment post-injury (Treadwell, 2018). Early referrals to mental health professionals can improve psychological adjustment and facilitate a more rapid return to work (Grob et al., 2008).

Partial hand loss is considered more disabling than lower limb loss (Whelan & Farley, 2018). The American Medical Association's disability rating system identifies partial hand loss as a much greater whole-person impairment than lower limb loss, 54% versus 40%, respectively (Whelan & Farley, 2018). However, this rating system is based exclusively on anatomical limb loss. It does not consider psychological impairments, such as stress and anxiety disorders, major depression, and psychological adjustment problems commonly associated with partial hand loss (Grob et al., 2008; Treadwell, 2018). Therefore, the degree of disability experienced by the partial hand population is likely greater. The partial hand population is also at an increased risk of developing mental health conditions compared to other extremity loss levels (Kearns et al., 2018). Researchers have documented health disparities among the partial hand population. However, social stigma, gaps in health care provider knowledge, and limited access to rehabilitative interventions remain commonplace (Graham et al., 2021; Treadwell, 2018).

The underlying causes of the disparities experienced by this population are largely unknown. Although partial hand prosthetic technology has advanced in recent years, prosthetic device procurement remains a challenge, as this type of technology is often deemed unnecessary by reimbursement mechanisms (Treadwell, 2018). For those individuals who have access to prosthetic device technology, delays in device fitting, inadequate training, improper fitting, and perceptions of limited functional benefits contribute to high prosthesis rejection rates among the partial hand population (National

Academies of Sciences, Engineering, and Medicine, 2017). Some have also hypothesized that individuals with partial hand loss are less likely to accept their injuries because of inconsistent and uninformed responses from the health care team involved in immediate stages of recovery (Kearns et al., 2018). Attitudes and language, such as “it’s just a finger” inaccurately portray the severity of partial hand loss and set an unrealistic expectation of returning to pre-injury functioning levels. A proactive, interprofessional approach to rehabilitation, including prosthetic device training, can help to facilitate acceptance and embodiment of prosthetic technology, thus improving functional outcomes (Latour, 2020). The partial hand loss population’s health outcomes are a consequence of multiple determinants, including risk factors, protective factors, and other influences across the lifespan. Effective treatment interventions will vary from person to person and depend on a multitude of individual factors (Latour, 2021). A population health perspective, acknowledging the mental and physical health disparities experienced by the partial hand population, can provide a foundation for effective, person-centered health care interventions.

Rehabilitation

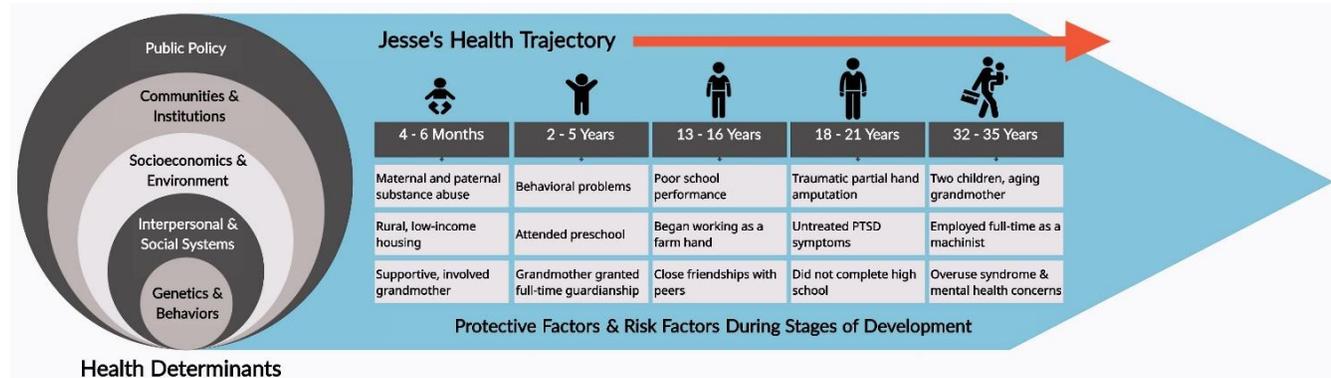
The LCHD framework can be integrated into all stages of rehabilitation for this population. Opportunities to implement a life course approach when practicing arise when advocating for equitable access to skilled prosthetic rehabilitation services, providing access to community support resources, and collaborating with all members of the specialized interprofessional team (Latour, 2021). Gathering detailed occupational histories with a focus on protective and risk factors occurring across the lifespan is another opportunity to integrate a life course perspective into service provision for this population. Furthermore, LCHD principles can serve as the basis for providing client-centered education designed to engage and empower individuals to become active members of the rehabilitative process (Latour, 2021). Decreasing health disparities for the partial hand population involves a life course approach centered around interprofessional practice and client-centered care, bearing in mind the long-term psychosocial, functional, and economic risk factors associated with partial hand loss.

Case Study: Jesse

Jesse is a 34-year-old man who sustained traumatic amputations of all five digits below the MCP joint of his right hand at 18 years of age. Only a small portion of his palm remains. Jesse presented to the community health clinic with complaints of musculoskeletal pain in his uninvolved hand and arm, and symptoms of depression, including feelings of isolation and hopelessness. He was referred to occupational therapy for evaluation and treatment of overuse syndrome. The occupational therapist used the LCHD framework to guide the evaluation and intervention process. A detailed occupational profile was obtained, identifying multiple determinants and contextual transactions across Jesse’s lifespan. The occupational therapist focused on identifying personal factors, including genetic and behavioral contexts, and external factors, including Jesse’s social, environmental, community, and public policy surroundings. Considering the timing and sequence of biological, psychosocial, and cultural influences on Jesse’s life allowed the occupational therapist to understand better his current health and how best to prevent further disparity. Jesse’s health trajectory was identified by analyzing cumulative risk factors, protective factors, and influences during critical developmental stages. Jesse’s health trajectory served as the foundation for developing and implementing a client-centered care plan. Figure 1 depicts the LCHD framework as it relates to Jesse’s case study.

Figure 1

Jesse's Case Study: A Graphic Depiction of the LCHD Framework



Implications for Occupational Therapy

America's dominant philosophical movements have influenced the profession of occupational therapy. Pragmatism was the dominant philosophical movement during the time occupational therapy was founded (Hinojosa, 2017). The therapeutic value of "occupational work" was established through pragmatic thought and reasoning (Hinojosa, 2017). In the 1940s, the profession of occupational therapy began to shift toward modernism, emphasizing the importance of theory and science (Hinojosa, 2017). Today, occupational therapy remains rooted in science and evidence-based perspectives. However, some have raised concerns over losing the art of practice to a purely science-driven profession (Hinojosa, 2017). Hinojosa (2017) proposes that the profession would benefit from adopting a postmodern pluralistic perspective, embracing science while simultaneously recognizing the importance of a multi-perspective approach to practice. Postmodern pluralism values diverse perspectives in the continued development of the profession's scope of basic and applied knowledge (Hinojosa, 2017). For example, conceptual frameworks that are not inherent to occupational therapy, such as LCHD, can be integrated into the scope of practice through a postmodern pluralistic perspective.

There is evidence suggesting that the profession of occupational therapy is moving toward postmodern pluralism. The fourth edition of the *Occupational Therapy Practice Framework Domain & Process* emphasizes a renewed focus on population-based interventions (American Occupational Therapy Association [AOTA], 2020). Identifying the health needs of populations and addressing those needs through integration with providers in health care, schools, businesses, and community-based organizations falls in the domain of occupational therapy and demonstrates the profession's value of interdisciplinary practice (Braveman, 2016). Moreover, occupational therapists working in expanded roles in advocacy, policymaking, and nonprofit organizational leadership reflect the profession's stake in population health and a pluralistic approach (Braveman, 2016).

The basic tenets of occupational therapy are rooted in a holistic perspective of health, acknowledging the transactional relationship among the individual or population, engagement in valued occupations, and the environmental context (AOTA, 2020). Occupational therapists recognize that health extends beyond the clinical presentation of symptoms and includes the timing and sequence of developmental stages and transitions, patterns of behavior, social circumstances, and health disparities (AOTA, 2020). Successful therapeutic outcomes hinge on the occupational therapist's ability to synthesize multiple perspectives of science, theory, and occupation (Hinojosa, 2017). Central to the evaluation and treatment planning process of occupational therapy is the occupational profile (AOTA, 2020). Client

information is gathered through the occupational profile to form a holistic and person-centered understanding of individuals and populations. Occupational histories, experiences, patterns of daily living, and relevant contexts are included in this analysis, underscoring the profession's multi-dimensional conceptualization of health (AOTA, 2020). The occupational profile presents an opportunity to weave the LCHD framework into practice. Conceptual frameworks, such as LCHD, provide structure for analyzing and addressing impairments that create barriers to occupational engagement (Cole & Tufano, 2008). The LCHD framework aligns well with occupational therapy, broadening the understanding of individual and population health and enriching the profession's holistic and client-centered values. Applying LCHD to the occupational therapy process can effectively contribute to the profession's progressive shift toward postmodern pluralism, incorporating multiple perspectives, various thinking strategies, and creativity into the clinical reasoning process (Hinojosa, 2017). The overarching goal of occupational therapy, to enhance and enable occupational engagement for individuals and populations, can be achieved through the acceptance of such diverse perspectives (AOTA, 2020; Hinojosa, 2017).

Conclusion

A life course approach to health is not a new concept. In the first half of the twentieth century, public health models were based on the prevailing idea that earlier life experiences shape adult health (World Health Organization, 2000). However, as the definition of health has evolved to embrace a pluralistic perspective, a deeper understanding of how social determinants and health disparities influence population health outcomes is needed. Compared to other limb loss levels, the partial hand loss population experiences disproportionate rates of disability (Treadwell, 2018). Using the LCHD framework to address the partial hand loss population's health involves the analysis of influential protective factors, risk factors, and relevant contexts occurring across the lifespan. The key benefit of LCHD is that it is interdisciplinary, involving stakeholders from diverse backgrounds and settings. Using the LCHD framework in occupational therapy practice is congruous with postmodern pluralism and signals a welcoming of diverse perspectives.

References

- American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process (4th ed.). *American Journal of Occupational Therapy*, 74(Suppl. 2), 7412410010. <https://doi.org/10.5014/ajot.2020.74S2001>
- Amputee Coalition of America. (n.d.). *Resources*. Amputee Coalition. <https://www.amputee-coalition.org/resources>
- Badash, I., Kleinman, N. P., Barr, S., Jang, J., Rahman, S., & Wu, B. W. (2017). Redefining health: The evolution of health ideas from antiquity to the era of value-based care. *Cureus*, 9(2), e1018. <https://doi.org/10.7759/cureus.1018>
- Braveman, B. (2016). Population health and occupational therapy. *The American Journal of Occupational Therapy*, 70(1), 7001090010p1–7001090010p6. <https://doi.org/10.5014/ajot.2016.701002>
- Burton-Jeangros, C., Cullati, S., Sacker, A., & Blane, D. (Eds.). (2015). *A life course perspective on health trajectories and transitions*. Springer.
- Burger, H., Maver, T., & Marinček, Č. (2007). Partial hand amputation and work. *Disability and Rehabilitation: An International, Multidisciplinary Journal*, 29(17), 1317–1321. <https://doi.org/10.1080/09638280701320763>
- Cole, M., & Tufano, R. (2008). *Applied theories in occupational therapy: A practical approach*. Slack Incorporated.
- Coppard, B. M., Lohman, H., Latour, D., & Vacek, K. M. (2020). Upper extremity prosthetics. In *Introduction to orthotics: A clinical reasoning & problem-solving approach* (pp. 461–481). Elsevier/Mosby.
- De Bellis, M. D., & Zisk, A. (2014). The biological effects of childhood trauma. *Child and Adolescent Psychiatric Clinics of North America*, 23(2), 185–222. <https://doi.org/10.1016/j.chc.2014.01.002>
- Dillingham, T. R., Pezzin, L. E., & MacKenzie, E. J. (2002). Limb amputation and limb deficiency: Epidemiology and recent trends in the United States. *Southern Medical Journal*, 95(8), 875–883. <https://doi.org/10.1097/00007611-200208000-00018>
- Fahrenkopf, M. P., Adams, N. S., Kelpin, J. P., & Do, V. H. (2018). Hand amputations. *Eplasty*, 18, ic21.
- Graham, E. M., Hendrycks, R., Baschuk, C. M., Atkins, D. J., Keizer, L., Duncan, C. C., & Mendenhall, S. D. (2021). Restoring form and function to the partial hand amputee: Prosthetic options from the fingertip to the palm. *Hand Clinics*, 37(1), 167–187. <https://doi.org/10.1016/j.hcl.2020.09.013>
- Grob, M., Papadopoulos, N. A., Zimmermann, A., Biemer, E., & Kovacs, L. (2008). The psychological impact of severe hand injury. *The Journal of Hand Surgery, European Volume*, 33(3), 358–362. <https://doi.org/10.1177/1753193407087026>
- Halfon, N., Forrest, C., Lerner, R., & Faustman, M. (Eds.). (2018). *Handbook of life course health development*. Springer. <https://doi.org/10.1007/978-3-319-47143-3>
- Healthy People 2030. (2020). *Social determinants of health*. Office of Disease Prevention and Health Promotion. <https://health.gov/healthypeople/objectives-and-data/browse-objectives#social-determinants-of-health>

- Hinojosa, J. (2017). How society's philosophy has shaped occupational therapy practice for the past 100 years. *Open Journal of Occupational Therapy*, 5(2). <https://doi.org/10.15453/2168-6408.1325>
- Jacob, C. M., Baird, J., Barker, M., Cooper, C., & Hanson, M. (2017). *The importance of a life course approach to health: Chronic disease risk from preconception through adolescence and adulthood*. National Institute for Health Research Southampton Biomedical Research Centre. <https://www.who.int/life-course/publications/importance-of-life-course-approach-to-health/en/>
- Kearns, N. T., Jackson, W. T., Elliott, T. R., Ryan, T., & Armstrong, T. W. (2018). Differences in level of upper limb loss on functional impairment, psychological well-being, and substance use. *Rehabilitation Psychology*, 63(1), 141–147. <https://doi.org/10.1037/rep0000192>
- Lake, C. (2009). Experience with electric prostheses for the partial hand presentation: An eight-year retrospective. *Journal of Prosthetics and Orthotics*, 21(2), 125–130. <https://doi.org/10.1097/JPO.0b013e3181a10f61>
- Larson, K., Russ, S. A., Kahn, R. S., Flores, G., Goodman, E., Cheng, T. L., & Halfon, N. (2018). Health disparities: A life course health development perspective and future research directions. In N. Halfon, C. B. Forrest, R. M. Lerner, E. M. Faustman (Eds.), *Handbook of life course health development* (pp. 499-520). Springer International Publishing. <https://doi.org/10.1007/978-3-319-47143-3>
- Latour, D. (2020). Improving outcomes for persons with congenital limb absences. *Academy Today*, 16(4), 11–13.
- Latour, D. (2021). *Upper limb loss prosthetic rehabilitation for occupational therapists: Intervention* [PowerPoint slides]. Kodiak@WNE. <https://kodiak.wne.edu/d21/le/content/73643/viewContent/1161150/View>
- Lynch, J., & Smith, G. D. (2005). A life course approach to chronic disease epidemiology. *Annual Review of Public Health*, 26, 1–35. <https://doi.org/10.1146/annurev.publhealth.26.021304.144505>
- Mosey, A. C. (1970). *Three frames of reference for mental health*. C.B. Slack.
- Mosey, A. C. (1985). A monistic or a pluralistic approach to professional identity? Eleanor Clarke Slagle lecture. *American Journal of Occupational Therapy*, 39(8), 504–509. <https://doi.org/10.5014/ajot.39.8.504>
- National Academies of Sciences, Engineering, and Medicine. (2017). *The promise of assistive technology to enhance activity and work participation*. National Academies Press (US). <https://doi.org/10.17226/24740>
- Nash, D. B., Fabius, R. J., Skoufalos, A., & Ogkesby, W. H. (2021). *Population health: Creating a culture of wellness*. Jones & Bartlett Learning.
- Orentlicher, M. L., Schefkind, S., & Gibson, R. W. (Eds.). (2015). *Transitions across the lifespan: An occupational therapy approach*. AOTA Press.
- Pitonyak, J., Pergolotti, M., & Gupta, J. (2020). Understanding policy influences on health and occupation through the use of the life course health development (LCHD) framework. *American Journal of Occupational Therapy*, 74(2), 7402090010p1–7402090010p6. <https://doi.org/10.5014/ajot.2020.742002>
- Treadwell, K. T. (2018). Addressing partial-hand amputation. *Academy Today*, 14(4), 22–24.
- Whelan, L., & Farley, J. (2018). Functional outcomes with externally powered partial hand prostheses. *Journal of Prosthetics and Orthotics*, 30(1), 69–73. <https://doi.org/10.1097/JPO.000000000000180>
- World Health Organization. (2000). *A life course approach to health: The implications for training of embracing*. https://www.who.int/ageing/publications/lifecourse/alc_lifecourse_training_en.pdf
- World Health Organization. (2021). *Constitution*. <https://www.who.int/about/governance/constitution>
- Ziegler-Graham, K., MacKenzie, E. J., Ephraim, P. L., Travison, T. G., & Brookmeyer, R. (2008). Estimating the prevalence of limb loss in the United States: 2005 to 2050. *Archives of Physical Medicine and Rehabilitation*, 89, 422–429. <https://doi.org/10.1016/j.apmr.2007.11.005>