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Utilization and Validation of the Global Leadership Initiative on Malnutrition (GLIM): A Scoping Review

Dr. Isabel Correia and Dr. Leah Gramlich

Ashley: Malnutrition is a global problem across the continuum of care. Further, diagnosing malnutrition remains a significant challenge throughout healthcare settings, partially due to evolving diagnostic criteria. Over the past decade, consensus statements on malnutrition diagnostic criteria have been published by the Academy of Nutrition and Dietetics and the American Society for Parenteral and Enteral Nutrition as well as the European Society for Clinical Nutrition and Metabolism. However, the diagnostic criteria included in these guidelines differ. To help establish a global set of diagnostic criteria, in late 2018, the Global Leadership Initiative on Malnutrition, or GLIM, published a consensus statement on malnutrition diagnostic criteria. The initiative included experts from several international clinical nutrition societies. The GLIM consensus includes a minimal set of clinically relevant diagnostic criteria that can be applied in a variety of settings and patient populations. Since that consensus publication, hundreds of studies have been published utilizing the GLIM criteria. A scoping review on the utilization and validation of GLIM was published in February 2022 in Clinical Nutrition.

Hello, my name is Ashley Bronston. I'm a registered dietitian with the Abbott Nutrition Health Institute.

Today we are honored to be joined by two of the authors of that scoping review—Dr. Isabel Correia from Brazil and Dr. Leah Gramlich from Canada. Welcome.

Dr. Correia: Hello. It's a pleasure to be here today.

Dr. Gramlich: Yes, very nice to be here. Thanks for having me.

Ashley: Dr. Correia is a retired professor of surgery from the Universidade Federal de Minas Gerais and chief of the Nutrition Therapy Team at the Alfa Institute of Gastroenterology and Surgery at the University Hospital, Belo Horizonte, in Brazil.

Dr. Gramlich is a nutrition expert and Gastroenterologist. She is a Professor in the Department of Medicine at the University of Alberta with a cross appointment in Agriculture Life and Environmental Science. She is also the Nutrition Services Provincial Medical Advisor for the Alberta Health Services.

Ashley: Dr. Correia and Dr. Gramlich, you were both authors on the 2018 GLIM consensus; Dr. Gramlich, can you please provide some background on GLIM and why it was needed by the global nutrition community?

Dr. Gramlich: Thanks for this question, Ashley. The global leaders in malnutrition really came together because although malnutrition is a global concern associated with incremental morbidity, mortality, and cost, there's actually a fundamental lack of consensus on diagnostic criteria for malnutrition in clinical settings, and no single existing approach has secured broad based global acceptance. So, for instance, I'm Canadian, and we use this objective global assessment as a tool. However, that might not be commonly used in other jurisdictions. In addition, our evolving understanding of the contributions of inflammation and disease to malnutrition render some of these concepts relevant because we need to be iterating towards a consistent definition or diagnosis that might be applied through the international classification of diseases in order to respond to the needs of clinical nutrition and medical communities and the need to document malnutrition. The Global Leadership Initiative was convened in actually 2016, and the main goal was to reach a consensus on standardizing the clinical practice of malnutrition diagnosis. In addition, the global leadership initiative on malnutrition sought to clarify overlaps with other disease related classifications, including cachexia.

Ashley: Thank you. That information was so insightful. Dr. Correia, we know that since the GLIM consensus publication, many studies have utilized the GLIM criteria, can you expand on those studies and why this scoping review on GLIM was conducted?

Dr. Correia: Well, this is a very interesting question because since we have the GLIM consensus with the definitions of the criteria that have been indicated to classify the nutritional status of the patients, one would assume that people were carrying out studies based on these variables, the five variables, and that most of the studies using the GLIM definition, GLIM consensus would depict how the variables had been used. But one thing that we have realized is that most of the studies use the combinations in different ways. Some only used two of them; some use all of them. But what has been a major concern is that most of the studies did not really define in the methods how the combinations had been carried out. And of course, this leads to different conclusions, which in a way might jeopardize the whole purpose of creating a global consensus in the fight against malnutrition. So the idea of writing a scoping review was exactly to clarify concepts; also to investigate research conduct. And by following a predefined review aiming at how to narrow the gap between what we meant by publishing the GLIM consensus and analyzing how these variables were or have been used. So I think this is very important because from a method, the quality of the methods, this is what has been able to show us that maybe we should be striving for better methods.

Ashley: It seems that we are seeing more and more scoping reviews in the nutrition literature. Dr. Correia, what are your thoughts on why this is happening?

Dr. Correia: Well, I think this is happening because with the deluge of information and publications, it's been tremendous. I mean, if we search in PubMed a specific topic, there is so much information about that specific topic and many of them reviews, but some, I would dare say many of them are not really following specific methods. It gets to be confusing for the readers and especially for the non-experts to really keep up with the quality of science and be able to adapt to translate the bad things with their practice. So scoping reviews has as a main goal exactly to narrow this gap between what has been and is being produced and what really impacts on clinical practice.

Ashley: That's such an interesting point. Dr. Gramlich, I will direct this next question to you. So with this scoping review, what questions were you hoping to answer by analyzing the published literature?

Dr. Gramlich: Thanks for that question, Ashley, and thanks to Dr. Correia for helping illuminate the GLIM process. So GLIM identifies that valid tools, validated tools be used to screen for malnutrition and that the practitioner, a clinician, look at both etiologic factors such as inflammation or reduced oral intake and phenotypic factors such as weight loss, low BMI, and low fat free index, for instance. What we wanted to do with the scoping review specifically was to look at how investigators were using these various GLIM criteria, and Isabel alluded to the fact that given that there are two etiologic criteria and three phenotypic criteria, one could come up with a diagnosis of malnutrition using a variety of combinations of these etiologic and phenotypic criteria. So the first role of our scoping review was to assess which criteria and how those GLIM criteria were used in the literature since the publication of GLIM, and whether or not the GLIM criteria has been diagnostic of malnutrition were validated against, for instance, a semi gold standard. So we wanted to understand published guidance on validation of operational criteria. And these were suggested by Heather Keller and Marian De Van Der Schueren, who encouraged us to report on reliability and validity of the methods. That's what our scoping review aimed to address.

Ashley: And Dr. Gramlich, can you please tell us a little about the volume of studies on GLIM and what studies were included in this scoping review?

Dr. Gramlich: That's a really good question. So what we sought to do was to identify the literature subsequent to the publication of the GLIM Consensus Definition. And with that publication we identified initially over 500 reports that were identified simply by searching for GLIM. We reduced duplicates and then we screened the records and we excluded records that included book chapters or conference abstracts or editorials that mention GLIM. We also excluded reviews or letters or comments. So were left with 474 articles that were assessed for eligibility. Of those, 395 were excluded. Several were not in peer reviewed journals. We couldn't get full text publications, although they cited GLIM, they may not have employed GLIM based criteria, and we didn't think we could look at that. The publications didn't include an adult population. They weren't in English language or it was part of a review letter. And so we ultimately included a total of 79 articles in our review, which were published between 2019 and 2021.

Ashley: Okay, let's get to the exciting part. I want to hear about the results you found. Now, what was surprising most to each of you?

Dr. Correia: So as mentioned, we ended up including 79 studies. Those were the ones we really reviewed. 32% were inpatients, at least 65 years of age, and 67% occurred in hospitals. Of course, the majority were cohort studies. The interesting thing is that out of these studies, 57% employed all the five criteria, many of them employed BMI, which is something that it was included by consensus in the included criteria that many of those, especially those who truly believe in the importance of clinical reasoning, do not really consider it adequate for the diagnosis. And these have been well discussed throughout all the publications of the GLIM group. But it's interesting to find out that many of these studies we reviewed used BMI and maybe because this is what it is

available in databanks. But another important thing that really raised our attention was the fact that the great majority of the studies did not contemplate a basic fundamental tenet of the scientific method, which is sample size calculation. So we ended up discussing these papers, but also raising an important question is how the studies have been carried out regarding these that I have just mentioned. So although there have been so many publications, we could say the GLIM criteria have been extensively studied. The best combinations, at least from clinical practice were not really used to having BMI as the most used. And as I have mentioned, a clear lack of adequate methods such as sample size.

Dr. Gramlich: Isabel, I acknowledge your observations and echo your sentiments and concerns. One of the things that surprised me the most is the sheer volume of publications building on the GLIM method. To me, that speaks to the appetite there is globally for consensus for a common approach or common in diagnostic strategy to help us define malnutrition as the entry point into nutrition care processes. So I think there's a big appetite for a common approach. This study that we've done a scoping review illustrates that although GLIM has been broadly embraced and welcomed by the nutrition community across the world, it may not be perfect. It's not a surrogate for other validated methods. It can be used in combination with other methods, and it needs ongoing refinement so that the researcher who is using GLIM needs to recognize the requirement for validation of methodology and specificity around which etiologic and phenotypic criteria are used. So I think that that's a real strength of this work and a strength of the GLIM work. As Isabel has alluded to, we need to continue to refine it and the concern is that researchers or practitioners may be using GLIM as a strategy to diagnose malnutrition when that wasn't exactly the intent and they may be using it to do research on, but they need to pay attention, particularly to robust methodology, as Isabel has alluded to.

Ashley: And what do the results of the review mean for future research as well as clinical practice?

Dr. Gramlich: You know, the key features of the malnutrition diagnosis are similar, regardless of the variety of tools we have and the key features focus on history of weight loss, oral intake, presence of inflammation, physical examination, features of lean tissue and fat loss, but using them in a way to advance the science. For instance, validating combinations of certain etiologic and phenotypic criteria in GLIM warrant consideration, paying attention to key research considerations such as a sample size calculation prior to undertaking research where an analysis of data is really important. For the practitioner, there is no surrogate for a focused history and physical examination that applies to a unique patient. But we must recognize that across patients it's a value to aggregate information and aggregate experience so that we can understand how better to treat populations, how we can capture data, and continue to shine a light on the evolving science around the diagnosis and care of patients with malnutrition.

Dr. Correia: I totally agree with Dr. Gramlich in everything she has mentioned because after all, what we wanted with the GLIM criteria was to as the name indicates to have a global consensus. Now, consensus does not necessarily mean that the five criteria that have been indicated to point to these diagnoses played the same in the diagnosis. So it's absolutely important to validate and also after this validation, to acknowledge that in clinical practice, this is probably the best and this combination is the one we are going to use in order not to have false negative diagnosis. So that's why it is so important to have good methodologic studies being carried out with good validity. And also being reliable.

Ashley: Now, switching gears just a little bit. Dr Correia, you were a co-author of the 2021 paper, "Clinical nutrition and human rights: An international position paper." Talk to us about that paper and what that means in the context of GLIM and malnutrition diagnosis.

Dr. Correia: Well, thank you for this question. Well, I think the two principles go along perfectly well and together. I'll start with the GLIM and the name 'Global Consensus,' with the focus on us facilitating a diagnosis of mild patients, in particular among those who are non-experts, who do not have sophisticated tools, who do not do research. And the purpose of that is to early diagnose the situation, but mostly to early treat. And when we discuss nutritional therapy in the patients, the roads throughout his or her hospitalization, we are discussing a basic principle of the human right, to provide food. And of course, nutrition is not only food. Many times we have to use enteral and parenteral nutrition, but this is all in the principle of nourishing an individual and within the principles, the philosophy of human rights that is well depicted in the concept of human rights. So I think the two go along very well and have a global perspective, not only to raise awareness, but to make sure that people understand the importance of the nutritional status and of feeding the individual as a human right.

Ashley: And lastly, what advice do you have for nutrition researchers and clinicians as they consider utilizing the GLIM criteria in their practice?

Dr. Gramlich: There's no surrogate for focused nutrition history and physical examination. GLIM gives us a definition—a diagnosis—that requires further validation and research to understand its interpretability. It's important for clinicians to be aware of GLIM because we work in a global community. We interpret literature globally, and we need to recognize that there are a variety of strategies to diagnose malnutrition that may or may not be linked to coding strategies. There is a movement afoot to continue to aggregate definitions that are applicable globally, but it's no surrogate for the targeted, focused history and physical exam that is used by a nutrition clinician.

Ashley: We have come to the end of our time together, but I want to thank both Dr. Correia and Dr. Gramlich for talking with us today and sharing this information on GLIM. Congratulations to you and your co-authors on this publication.

Dr. Gramlich: Thank you so much for including me in this discussion.

Dr. Correia: I think this is an important topic, and sometimes it is even better when we can listen to the authors and hear their insights and their feelings towards what it is in the paper. So I really thank you for the opportunity you've given us to discuss this very relevant topic. Thank you so much, it's been a pleasure.

Ashley: Again, thanks so much. Now for our listeners, if you would like to learn more, you can find a link to this paper as well as a video reviewing the results at ANHI.org. Additionally, there is a CE program on GLIM from Dr. Gramlich entitled "GLIM: GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION: A CONSENSUS REPORT FROM THE GLOBAL NUTRITION COMMUNITY." And become an ANHI member today, by clicking "register" at the top of our homepage, you'll receive regular nutrition science news updates. And of course, you can also follow the Abbott Nutrition Health Institute on LinkedIn. Thanks, everyone. Stay safe and healthy.