Review

Comparison of innovative communication approaches in nutrition to promote and improve health literacy

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ABSTRACT

The translation of scientific evidence into guidelines and advice is a fundamental aspect of scientific communication within nutrition and dietetics. For communication to be effective for all patients, health literacy (HL) must be considered, i.e. an individual's capacity to obtain, comprehend and utilise information to empower decision-making and promote their own health. HL levels are varied and difficult to judge on an individual basis and have not been quantified, thus not giving a population mean HL competency indication. It has been evidenced that most of the working age population in England cannot comprehend healthcare materials due to complexity, thereby promoting a need for agreed readability thresholds for written healthcare information. A wide range of modalities within dietetics are used to communicate to a varied audience with the primary form written, e.g. journal articles, plain language summaries and leaflets. Audio/visual and digital communications are increasing in dietetic care and welcomed by patients; however, the effectiveness of such approaches has not been studied thoroughly and digital exclusion remains a concern. Communication considering a patient's HL level leads to empowerment which is key to effective management of chronic diseases with a high treatment burden. Therefore; this review will focus on the importance of modalities used to communicate science in nutrition to ensure they are appropriate in relation to Health Literacy.

Keywords: cystic fibrosis (CF), effective communication, health literacy, readability, scientific communication

INTRODUCTION

Scientific communication (SC) is defined as scientific information transmission to a specialised/non-specialist audience by methods such as verbal explanation, writing, lectures and digital means [1]. Effective SC is important when securing research funding, in media communication and informing policy. Within healthcare, SC is vital, especially as the final stakeholders for health-related research are patients, thereby directly impacting their health [2].

It is recognised that low patient literacy has been linked to poorer health outcomes, affecting how clinicians deliver healthcare [3]. Literacy is the extent of ability to read, write and have the skills to recognise words and understand text [4]. Health literacy (HL) extends this definition, further including comprehension of scientific knowledge, and having accessibility and skills to make appropriate health-related decisions [5]. In effective communication, information is given by methods appropriate to the patient's HL level. DeWalt and colleagues noted that clinicians are generally poor judges of patient HL levels and so developed a HL universal precautions (HLUP) toolkit to help deliver healthcare information at a low HL level in a General Practice [6]. It has been shown that as many as four in 10 adults in the UK struggle to understand and use typical medical information designed for the public [7], where such low HL has been linked to a range of problems, including poor general health, inappropriate use of health services and reduced life expectancy [7]. The majority of adults in England are in the 11-14 year old reading age group [8] and Table 1 shows the levels of literacy related to age and understanding in a health setting [8].

Dietitians must not only understand the scientific mechanisms behind nutrition and grasp the research methods needed to critically appraise the evidence, but they must also communicate appropriate information clearly at patients' understanding levels. Thus, dietetics has been described as both an art and a science [9]. Dietitians artfully communicate scientific findings through varied modalities at a populationally understandable level to promote health, prevent disease and manage conditions. Therefore, the aim of this article is to discuss communication approaches and modalities which influence HL both within healthcare and specifically dietetics, in order to improve and promote HL in patients.

Health Literacy

The concept of HL, originally only alluded to functional literacy, i.e. the ability to read, understand and follow health information and advice, has evolved extensively [11] (Table 2). HL is a dynamic concept, as over a patient's lifetime their HL capacity can change, with degree of cognitive and physical health altering with age or disease stage [23].

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Literacy national standard	Age and school level	Adults will be able to:	In a health setting adults will be able to:
Entry 1	Typical 7 year old	• read short texts with repeated language patterns on familiar topics • read signs and symbols, produce limited writing – only short sentences • engage in simple exchanges of information	• understand pictures on a health promotion poster • read and understand 'way in' and 'way out' signs but not 'entrance' and 'exit' signs • tell a clinician that they are not feeling well but not describe degrees or type of pain
Entry 2	Typical 9 year old	• read short straightforward texts on familiar topics • obtain information from familiar sources (e.g. a leaflet, a short letter) • show some awareness of audience when writing (e.g. a short informal letter or note) • engage in discussions with familiar people	• understand the words on a simple poster such as 'smoking is bad for you' • understand the words but not necessarily the numbers of a routine appointment letter • tell a clinician in simple language the degree and type of pain they have
Entry 3	Typical 11 year old	• read more accurately and independently • obtain information from everyday sources e.g. newspapers • communicate (orally and in writing) information and opinions with some adaptation to the intended audience	• understand the words on more complex posters and simply worded leaflets • understand short formal letter, note or form, telephone call to 111 • describe in more detail degree and type of pain and understand what they have been prescribed by a clinician
Level 1	GCSE grade D-F	• read texts of varying lengths on a variety of topics • obtain information from different sources (simple reports, text books, work manuals) • in written communication, demonstrate an ability to express ideas and opinions clearly using length, format and style appropriate to audience and purpose (formal letter, memo, brief report etc) • be confident in oral communication • make contributions to discussions that demonstrate awareness of others' views	• understand more complex information on a variety of different health related matters e.g. health promotion information on the importance of diet and simple clinical information, mediated and interpreted in a supported manner • can describe confidently degree and severity of pain • understand simple oral instructions but not the importance of compliance or can clarify what they have been told
Level 2	GCSE grade A*-C	• read from texts of varying complexity accurately and independently (more complex books, text books, report, training manuals) • write to communicate information, ideas and opinions clearly and effectively using length, format and style appropriate to purpose, content and audience (e.g. complex letter, essay, reports) • make a brief presentation or speak in a meeting	• understand and interpret more complex information on a variety of different health related matters e.g. health promotion information on the importance of diet and simple clinical information, mediated and interpreted in a supported manner • volunteer unsolicited information about degree and severity of pain • ask simple questions in order to gain an understanding of the rationale behind a prescribed course of treatment

Table 1: Levels of literacy related to age and understanding in a health setting [Taken from "Health Literacy "How to" Guide: NHS Health Education England (Available at https://library.nhs.uk/wp-content/uploads/sites/4/2020/08/Health-literacy-how-to-guide.pdf)]

As a result of the association between low HL and poorer health outcomes [4], much research explores the possible link between poor chronic disease management and low HL. An adequate level of HL is needed to empower individuals to take charge of their own health or care for another, especially when they are critically involved in disease management e.g. diabetes [24].

A range of interventions to improve health knowledge in people with lower HL levels has been systematically reviewed by Pignone and colleagues [25], however, consistent differences in health knowledge pre and post intervention were not found. Intra-intervention differences were too various to draw firm conclusions and the studies reviewed often did not compare high and low literacy groups. Although HL can be measured using tools such as Rapid Estimate of Adult Literacy in Medicine, health outcome indications are limited to survey results with few longitudinal studies, thereby providing a limited evidence-base of prolonged health outcomes [25].

Although populational HL level in the UK has not been gauged, a key HL observational study investigated the relationship between health materials and literacy abilities of the English working-age-population (16-65 years). Several healthcare professionals (HCPs), including dietitians, judged representativeness of a national health booklets sample and a threshold comprehension level was found to be level 2 (5 GCSE's A* to C), representing 73% of health brochures. When compared to populational literacy data from a survey

sample of 7230 people [26], 40% of participants were below the comprehension threshold [27]. Literacy competency multivariate analyses demonstrated that sex (Adjusted Odds Ratio (AOR) = 1.25), age (1.44), ethinicity (1.43), English as first language 2.03), qualification level (2.38), job grade (1.40 – 1.88), income (1.41) and home ownership (1.32) were statistically significant, whereas nativity (i.e. born/not born in UK) (AOR=1.07) and employment (i.e. employed/not employed) (AOR=1.05) were not significant [27]. It must be noted that these results were produced from a small sample, not accounting for verbal communication or individual's material interaction. The population data is somewhat dated and limited, neglecting non-working-age HL levels and did not include all HL aspects, like accessibility and comprehension. Nevertheless, the results underline a need for health literature to target lower HL levels.

Plain Language Summaries (PLSs)

A prevalent communication mode is written text, including journal articles, Plain Language Summaries (PLS), health information leaflets and Patient Information Leaflets, relating to pharmaceutical medicines. Journal articles communicate scientific research findings to similarly skilled professionals; the language is complex and discipline-specific preventing general public understanding. Therefore, PLSs of scientific findings are devised and are in widespread use, increasing science accessibility to those with lower HL. Although they have been criticised for formatting and length inconsistency, [28] they are nevertheless useful to communicate research

Table 2: The evolving concept of health literacy: a selection of health literacy definitions in chronological order

Source and Year [Reference]	Definition
Nutbeam (1998) [11]	"The cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health."
American Medical Association (AMA) (1999) [12]	"The constellation of skills, including the ability to perform basic reading and numeral tasks required to function in the healthcare environment."
Nutbeam (2000) [13]	"The personal, cognitive and social skills which determine the ability of individuals to gain access to, understand, and use information to promote and maintain good health."
Institute of Medicine (2004) [14]	"The individuals' capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions."
Zarcadoolas *et al.* (2005) [15]	"The wide range of skills, and competencies that people develop to seek out, comprehend, evaluate and use health information and concepts to make informed choices, reduce health risks and increase quality of life."
Stocks *et al.* (2009) [16]	"The ability to understand and interpret the meaning of health information in written, spoken or digital form and how this motivates people to embrace or disregard actions relating to health."
Freedman *et al.* (2009) [17]	"The degree to which individuals and groups can obtain, process, understand, evaluate, and act upon information needed to make public health decisions that benefit the community."
Healthy People (2010) [18]	"The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions."
Sørensen *et al.* (2012) [19]	"Health literacy is linked to literacy and entails people's knowledge, motivation and competencies to access, understand, appraise and apply information to make judgements and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain and improve quality of life during the life course."
Dodson *et al.* (2015) [20]	"The personal characteristics and social resources needed for individuals and communities to access, understand, appraise and use information and services to make decisions about health. Health literacy includes the capacity to communicate, assert and enact these decisions."

This table was adapted from [19, 21, 22].

findings. One example of innovation has been when a scientific or medical journal takes a positive action to also include a Lay or Plain Language Summary. One example of such practice is the Publication, *Cystic Fibrosis Research News*, which is a relative rarity in respiratory peer-review publishing, as it mirrors the papers published in its sister journal, the *Journal of Cystic Fibrosis* (JCF). *CF Research News* aims to foster enhanced knowledge by patients, their families and other members of the lay community about research advances published in JCF and to provide an opportunity for authors to write summaries of their Original Articles and Short Communications published in JCF.

Cochrane Reviews, provide vital, rigorous and reputable evidence, however authors lack consistent adherence to the 'Plain Language Expectations for Authors of Cochrane Summaries' [29]. Points of author criticism are the continued technical jargon presence and only 23% of PLSs analysed being within the word count [30]. Locating PLSs online has also been highly criticised [31], highlighting the need for inter-discipline standardised practice.

The gold standard for assessing healthcare information readability is the Simple Measure of Gobbledegook [32] (Table 3). Various people such as original scientific authors, freelance writers and lay-people may be involved in writing a PLS. In most medical PLSs, the author writes corresponding PLS, helping thought continuity [31]. White and colleagues

piloted a second year undergraduate PLS writing course, with adherence criteria including a Flesh-Kincaid readability score of between grades 8 – 10 (age 13-16 years). Students described it as "tedious", having difficulty in preserving integral research meaning whilst keeping reading level low [36]. Furthermore, Brownell and colleagues confirmed the need for university training to build SC into the curriculum, with multiple opportunities for practice, feedback and revision [37].

Visual Aids (VA)

Audio Visual (AV) *techniques*

Although little evidence has shown learning outcome differences based on a target learning styles teaching approach [41]; preferences may influence information delivery choice, whether visual, kinaesthetic or auditory. AV communication synthesises such preferences together forming videos. The effectiveness of healthcare AV communication has not been widely studied, although certain patient groups have indicated a desire for video-based education [42]. One area that has used AV Digital Communication (DC)

Table 3: A selection of the various metrics used to assess readability of written text

Readability Index Name	Summary	Score Example	Age equivalent	Formula
Simple Measure of Gobbledygook (SMOG)	Estimates comprehension in terms of years of education needed. The first, middle and last 10 sentences should be sampled to calculate SMOG. It involves counting words with 3+ syllables. [32]	SMOG US grade 8 score	13-14 years	$3+$ square root $\sqrt{}$ [number of polysyllabic words x $(30 \div$ number of sentences)]
The Gunning Fog Index (GFI)	Similar to SMOG except it estimates first time readability comprehension in terms of years of education needed. The scale is from 6-17. [33]	GFI US grade 7-8 score	13-14 years	$0.4 \times$ [(words $\div$ sentences) $+ 100 \times$ (complex words $\div$ total words)]
Flesch-Kincaid Grade Score (FKG)	Usually used in education and assesses readability whilst weighting heavily on syllable count. [34]	FKG US grade 8 score	13-14 years	0.39 (total words/total sentences) $+ 11.8$ (total syllables/total words) $- 15.59$
Flesch Reading Ease Score (FRES)	English text on a scale of 100, with a higher number indicating easier comprehension. [35]	FRES score of 60-70	13 years	$[206.835 - (1.015 \times$ (total words $\div$ total sentences)) $- (84.6 \times$ (total syllables $\div$ total words))]

VA found on posters, brochures, websites and social media can promote health messages and include pictures, infographics, figures, charts and pictographs. Results from a randomised study found that when presenting risk probability (e.g. 2/100), graphically for low literacy groups, pictographs were more effective for denominators <100-1000 and bar charts for >1000 [38]. Pictographs with text have been found to reduce error of drug dosage administration to children among parents with low HL [39]. Pictures improve information recall, grab attention and promote health information understanding; especially simpler cartoon pictures complementing text [41]. To maximise effectiveness, they should be accompanied by captions to prevent erroneous interpretation and illustrate written communication; not distracting from the information.

to promote health is for handwashing in infection control (IC). Particularly, Stanford University published a wordless AV graphic animation illustrating SARS-CoV-2 spread and preventative measures, which will form part of a randomised trial comparing differences in behavioural intent after watching it, compared to placebo and control [43]. Benefits of AV communication include its deliverability without physical contact and it can be re-watched and potentially inform without language barriers.

Digital Communication (DC)

There has been accelerated DC use to promote health messages with increasing telehealth replacing clinics. Previously HCPs have resisted engagement with some DC forms, e.g. social media, due to medicolegal and ethical

issues [44]. Valdez and colleagues have cautioned rapid DC acceptance by stating that the existent digital exclusion divide among many groups, but especially those with certain disabilities could exacerbate health access inequalities [45]. Common digital inclusion barriers found in a rapid review included; physical access, usage skills and fearful attitudes [46]. DC has significant reachability; however, barriers must be considered for long-term patient care, and HCP burden.

A specific DC ethical concern of the adolescent patient-clinician relationship is maintaining professionalism. Patients with chronic diseases felt that increased communication with HCPs produced a trusting relationship and better health knowledge, however, clinicians thought it blurred lines between consent and duty of care limits which were being stretched to out-of-office hours [47]. More guidance and clarity are necessary for HCPs effective navigation of digital health communication.

The importance of Health Literacy and Communication in Nutrition and Dietetics

The communication method and HL knowledge underpins effective nutrition and dietetic communication. One estimation of patient HL in primary care is the newest vital sign (NVS) measure, in which a clinician asks six comprehension questions from an ice-cream label, with the number of correct answers indicating likelihood of HL level [48]. In a study by Caldwell (2020) NVS scores indicated that adolescents' HL increased with age, suggesting HL intra-age-group variation [49]. Age and comprehension level will affect a dietitian's communication approach clinically and in devising written materials, with the target audience informing communication style, information and complexity.

The varied audience with which dietitians must effectively communicate outside a patient counselling role; (carers, families and HCPs within the multidisciplinary team (MDT)) promoted a pilot workplace-based communication programme for Australian dietitians. It was rated very beneficial for those practicing <5 years, indicating significantly higher benefit than those working >5 years, highlighting that reflective learning experiences improve communication [50]. Recent focus has been on the HL knowledge of students training as HCPs because of the potential teaching impact on shaping future clinician's communication skills. Results have been unequivocal, finding lower than desired HL and a need for student training in HL communication [51-53].

'Good communication skills' is also a theme associated with Dietetic patient centred care (PCC) [54]. Based on 27 reviewed studies, communication skills valued by patient and dietitian included verbal and non-verbal, such as active listening, rewording and asking questions. All modes focused on patients' value and promoted understanding and patient-enablement contributing to the overall "collaborative partnership" as a HL output. This aforementioned review focused only on patient-clinician relationships, neglecting other modes of dietetic communication, such as active enteral feeding demonstrations, DC or written materials.

CONCLUSION

In conclusion; without acknowledgement of the individual's HL level, abilities and access, dietetic communication will be sub-optimal. Verbal and active communications in patient-clinician relationships are important. Written SC is currently largely aimed at too high a reading and HL level, indicating the need for a standardised readability testing approach to evaluate healthcare material suitability. The addition of VA is helpful in communication for people with low HL and although there are gaps in the research regarding effectiveness of DC and target patient populations, prevalence is likely to increase. All communication approaches must be used selectively in PCC, in order to negotiate treatment plans, educate verbally, create resources to improve condition manageability and ultimately patient healthcare empowerment.

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