

An Institutional Based Longitudinal Assessment of the Outcome of Delivery of Musculoskeletal Education in Primary Care using the Innovative Echo (Extension for Community Healthcare Outcomes) Technology

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Received: 05-02-2023 / Revised: 25-03-2023 / Accepted: 10-04-2023

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Conflict of interest: Nil

Abstract

Aim: To assess the impact of introducing a year-long MSK education programme in terms of increasing MSK knowledge and confidence in managing common MSK conditions in general practice, delivered through an ECHO programme.

Methodology: The MSK ECHO trial in ANMMCH ran for one year. The 90 minute sessions ran monthly, with the first session focusing on introducing the participants to the protocols, and the final session based on evaluation and reflection. Ethical approval was not required for this study as it was an evaluation of a new method of teaching. The range of topics was determined by the participants and included the: knee; shoulder; fibromyalgia; inflammatory arthritis in primary care; radiology in primary care; hand and wrist; foot and ankle. 23 GPs participated in the MSK ECHO trial. Prior to starting, each participant completed a questionnaire covering demographic details, prior MSK experience, confidence in examining, treating and diagnosing various MSK complaints, and confidence injecting common joint areas. They were also asked about their satisfaction with the quantity and quality of MSK education opportunities currently available for GPs. Finally, the participants were asked what they would like addressed during the programme and what they would like to gain from it.

Results: 20 of the original 23 GPs completed the final evaluation questionnaire, giving a response rate of 86.96%. At baseline, the majority were male (73.91%; 17 males, 6 females) and the average age was 46.5 years (range 35-60 years old). The participants' average number of years working as a GP and/or GP Partner was 11.7 years (range 6-27 years). Only 30% of those who completed the evaluation, had experience in MSK prior to this ECHO educational programme. Overall, a total of 15 case presentations discussed. The mean weighted average confidence prior to starting the programme was 3.21 (range 2-3.85), and following ECHO was 4.26 (range 3.1-4.45); an improvement of 1.05.

60% GPs reported that they were very confident in injecting joint areas after ECHO, whereas only 25% were confident prior ECHO. 60% of GPs strongly agreed that participation in the MSK ECHO network had enhanced understanding between the participating primary care, secondary care, and allied professionals whereas no one disagreed to this statement.

Conclusion: This research demonstrates that engagement of practitioners in ECHO can increase their understanding and confidence of common MSK complaints in general practice with minimal economic impact.

Keywords: General practitioners, Musculo-skeletal, education programmes, medical professional.

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Introduction

In the current context of change and uncertainty, healthcare professionals are expected to develop high levels of competencies to effectively manage complex health conditions and respond to populations' multiple needs [1]. Further, healthcare professionals' competencies such as leadership, clinical reasoning, ethical attributes and effective teamwork are founded at the premise of safety, quality, and accessibility improvements in healthcare [2, 3]. In recent decades, several continuing educational programs using information and communication technologies (ICTs) have been developed to overcome barriers related to healthcare professionals' participation in CE activities (e.g., staff shortages, cost, travel time) [4-6]. Advantages of ICT-based programs include increased accessibility, lower costs and personalization compared to large-group, in-person instruction [7]. One of these ICT-based programs is the Extension for Community Healthcare Outcomes (ECHO) Model [8].

ECHO is a continuing tele-education program that provides ongoing support and clinical supervision to healthcare professionals in the management of complex and chronic health conditions [9]. The programme aims to be an affordable but high-impact solution to the increasing demand on secondary and tertiary healthcare services, as well as expanding the capacity of both primary and community care, in keeping with current models of healthcare [10]. The intention is that a more patients will have access to best-practice specialty care, thus reducing the health disparities nationwide and improving patient outcomes. Key messages are delivered by the specialist practitioners and core learning is illustrated through case-based discussion.

ECHO is centered on four key principles: using multipoint video-conferencing technology; employing evidence based best practice; using case-based learning to enhance specialty training in primary care; and adapting services through monitoring plus evaluating outcomes from the ECHO model.

The current demand on both primary and secondary care services for musculoskeletal (MSK)-related conditions is significant. 20% of people consult a general practitioner (GP) regarding an MSK problem every year [11], with one in seven consultations concerning MSK conditions [12] and MSK issues are addressed in 12% of GP appointments [13]. An estimated 17.8 million people live with MSK conditions within the UK, i.e. approximately 28.9% of the total population [14]. Furthermore, MSK conditions contributed 1.36 million admissions to consultant care in England during 2016-17; 8.2% of all admissions to consultant care [15]. The resultant strain on secondary services is evidenced through prolonged waiting times, for example the knee and hip elective replacement waiting times averaged approximately 105 days in England, 2015-two of the five highest average waiting times [16]. Increasing capacity and quality of care in the primary care sector should reduce the demand for secondary care referrals, and thus address these healthcare pressures.

To date there have been a number of ECHO trials worldwide, though limited research has been performed on musculoskeletal conditions. One paper examining ECHO's use in chronic pain and opioid stewardship for remote communities within Ontario concluded that ECHO was a promising

model for these communities, and that its strengths lie within its simplicity, adaptability, and use of existing telemedicine infrastructure [17]. One systematic review [18] reasoned that project ECHO has the potential to be a cost-effective method to increase primary care knowledge and patient access to healthcare in remote locations, but further research is required to determine its efficacy and potential barriers. The aim of this project was to assess the impact of introducing a year-long MSK education programme in terms of increasing MSK knowledge and confidence in managing common MSK conditions in general practice, delivered through an ECHO programme.

Materials and Methodology

The MSK ECHO trial in ANMMCH ran for one year. The 90 minute sessions ran monthly, with the first session focusing on introducing the participants to the protocols, and the final session based on evaluation and reflection. Ethical approval was not required for this study as it was an evaluation of a new method of teaching. The range of topics was determined by the participants and included the: knee; shoulder; fibromyalgia; inflammatory arthritis in primary care; radiology in primary care; hand and wrist; foot and ankle.

The Hub in this ECHO model consisted of the Federation training HUB leads who were supported by colleagues from secondary care, including physiotherapists and consultants from orthopaedics, rheumatology, and radiology. These clinical leads, with input from the secondary care experts, developed plus delivered a skill-sharing service to the local General Practitioners (GPs) that covered MSK assessments, investigations and management of common primary care MSK conditions.

The 'Spokes' were then individual GPs who formed part of the MSK Primary Care Network and were contracted to deliver primary care MSK services.

23 GPs participated in the MSK ECHO trial. Prior to starting, each participant completed a questionnaire covering demographic details, prior MSK experience, confidence in examining, treating and diagnosing various MSK complaints, and confidence injecting common joint areas. They were also asked about their satisfaction with the quantity and quality of MSK education opportunities currently available for GPs. Finally, the participants were asked what they would like addressed during the programme and what they would like to gain from it.

Measurable outcomes established prior to the trial included: evidence of a reduction in referrals; patient satisfaction; GP satisfaction; reflection *via* annual appraisals; weekly surveys from the knowledge exchange to ensure continuous learning; and, overall summative assessment of Knowledge Framework. However, this paper focuses on reporting the questionnaire responses pre- and post-participation in the ECHO teaching programme.

Results

20 of the original 23 GPs completed the final evaluation questionnaire, giving a response rate of 86.96%. At baseline, the majority were male (73.91%; 17 males, 6 females) and the average age was 46.5 years (range 35-60 years old). The participants' average number of years working as a GP and/or GP Partner was 11.7 years (range 6-27 years). Only 30% of those who completed the evaluation, had experience in MSK prior to this ECHO educational programme. Overall, a total of 15 case presentations discussed

Table 1: Demographic and ECHO programme details.

Male female ratio	17:6 (73.91% : 26.09%)
Mean age (in years)	46.5 (35-60)
average number of years working as a GP and/or GP Partner	11.7 (6-27)
Having experience of MSK prior to this ECHO programme	6 (30%)
Total case presentations discussed	15

The participants were asked to rate their confidence out of five on a number of common primary care MSK components both before and after the intervention, with 1 inferring no/little confidence and 5 high confidence. The mean weighted average confidence prior to starting the programme was 3.21 (range 2-3.85), and following ECHO was 4.26 (range 3.1-4.45); an improvement of 1.05.

60% GPs reported that they were very confident in injecting joint areas after ECHO, whereas only 25% were confident prior ECHO. 60% of GPs strongly agreed that participation in the MSK ECHO network had enhanced understanding between the participating primary

care, secondary care, and allied professionals whereas no one disagreed to this statement.

Comparing the results before and after the MSK ECHO Network shows that the ECHO programme has helped improve the understanding of common MSK conditions, management of chronic MSK pain in primary care, confidence in undertaking common injections in primary care, and the understanding between primary and secondary care. The participants were also asked their general comments on the course, what they found most useful about the ECHO programme and aspects to improve the ECHO programme in the future.

Table 2: Comparison of the GPs’ reported confidence in injecting common joint areas, such as the knee and the shoulder, within general practice before and after the ECHO.

	Before ECHO	After ECHO
Very confident	25%	60%
Good confidence	20%	20%
Average confidence	20%	10%
Minor confidence	15%	5%
No confidence	20%	5%

Table 3: The GPs’ responses when asked if they agreed with the statement that participation in the MSK ECHO network had enhanced understanding between the participating primary care, secondary care, and allied professionals.

	% of GPs
Strongly agree	60%
Agree	25%
Neither agree nor disagree	15%
Disagree	0%
Strongly disagree	0%

Discussion

Musculoskeletal (MSK) conditions are among the key contributors to the Global Burden of Diseases (GBD) [19]. MSK

conditions are predicted to rise, both in prevalence and impact, as the global population ages and the risk for non-communicable diseases increases. This is

particularly true in low- and middle income countries (LMICs) with a greater than 60% increase over the last two decades [20]. MSK conditions are also key contributors to multi-morbid conditions, and the risk of multi-morbidity also increases with persistent musculoskeletal pain [21]. However, care is primarily condition-specific, despite policy frameworks re-orienting towards more integrated chronic condition care [20]. More importantly, care disparities remain recalcitrant to change due to complex interacting and context specific factors evident at the system-level (policy), at the service-level (health workforce gaps, unsustainable models of service delivery) and at the clinical and community-level (inadequate access to care, insufficient consumer voice; inadequate person-centered care) [22, 23]. Patients and their caretakers are the end consumers and potentially the most important stakeholders needed to influence key decision making in policy and markets to innovate. However, empowering them to achieve this outcome requires deliberate and intentional consumer engagement at all levels of healthcare. Therefore, healthcare providers' roles could be defined as partner, nurturer, facilitator of sense-making and enabler within the framework of healthcare education [24, 25].

Globally, there are many examples of successful innovation in MSK care and healthcare which are, in general, leading to improved efficiencies and quality of care around more integrated and person centered MoC. These innovations, driven by growing needs and the consumer voice, will increase with further advances in technology, communication exchange and healthcare education. It is in the area of innovation management that we must grow to allow the large and often chaotic innovations to be rigorously tested, filtered, adapted and adopted into practice

to improve healthcare productivity and outcomes (health and socio-economic).

This paper is the first of its kind in assessing MSK teaching delivered *via* ECHO in India and has begun to show the potential benefits of employing an ECHO style model to expand the capacity of primary care in diagnosing and treating common MSK complaints. The results clearly show improvements and warrant further research to continue. The videoconferencing style can access hard-to-reach practices that may be omitted in traditional face-to-face education and thus helps implement standardized care of patients. Griffiths and Miller provide a good summary of the benefits including overcoming physical and geographical boundaries and reducing feelings of intimidation or discomfort associated with new surroundings, and limitations-such as the dependence on access to the correct software and equipment and reliance on personal motivation, of e-mentoring in medicine [26].

Our results show an increase in confidence and understanding of all the MSK conditions that were covered during ECHO. This is in line with other research which primarily used similar self-efficacy and feedback questionnaires/focus groups [27-30] and objective measurements of knowledge [27]. Furthermore, there was an increase in confidence in diagnosing and treating almost all commonly presenting MSK conditions, with injecting common joint areas and treating chronic MSK pain showing particular progress. The weighted confidence in examining the individual body parts increased across the board; with the average rising from 3.41 to 4.26. In addition, participants had an opportunity to provide written feedback similar to previous research [27, 28]. A significant number reported increased confidence in MSK practice as well as improved knowledge and understanding. The case-based learning, specialist

presentations, and the two-way discussion with consultant expertise were reported to be some of the more helpful aspects of ECHO. [31]

Conclusion

ECHO is a low-budget high-impact method of increasing participant self-efficacy and knowledge over a large geographical area. It is hoped that ECHO will minimize disparities in healthcare across India, increase capacity of primary plus community care and thus decrease demand on secondary care services, and have minimal financial implications. This research demonstrates that engagement of practitioners in ECHO can increase their understanding and confidence of common MSK complaints in general practice with minimal economic impact.

References

1. Frenk J, Chen L, Bhutta ZA, Cohen J, Crisp N, Evans T, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376(9756):1923–58
2. Meretoja R, Koponen L. A systematic model to compare nurses' optimal and actual competencies in the clinical setting. *J Adv Nurs*. 2012;68(2):414–22
3. Pepin J, Goudreau J, Lavoie P, Belisle M, Blanchet Garneau A, Boyer L, et al. A nursing education research framework for transformative learning and interdependence of academia and practice. *Nurse Educ Today*. 2017;52:50–2.
4. McLoughlin C, Patel KD, O'Callaghan T, Reeves S. The use of virtual communities of practice to improve interprofessional collaboration and education: findings from an integrated review. *J Interprof Care*. 2018;32(2):136–42.
5. Ranmuthugala G, Plumb JJ, Cunningham FC, Georgiou A, Westbrook JI, Braithwaite J. How and why are communities of practice established in the healthcare sector? A systematic review of the literature. *BMC Health Serv Res*. 2011;11:273.
6. Wang R, DeMaria S Jr, Goldberg A, Katz D. A systematic review of serious games in training health care professionals. *Simul Healthc*. 2016;11(1):41–51.
7. Coventry TH, Maslin-Prothero SE, Smith G. Organizational impact of nurse supply and workload on nurses continuing professional development opportunities: an integrative review. *J Adv Nurs*. 2015;71(12):2715–27
8. University of New Mexico: Project ECHO. University of New Mexico, School of Medicine; 2020. Available from: <https://echo.unm.edu/> [Last accessed on 23 November 2022].
9. Komaromy M, Ceballos V, Zurawski A, Thomas Bodenheimer, David H, Arora S. Extension for Community Healthcare Outcomes (ECHO): A new model for community health worker training and support. *J Public Health Policy* 2018;39(2): 203-216.
10. Department of Health, Northern Ireland publication. *Health and Wellbeing 2026 - Delivering Together* 2017.
11. Arthritis Research UK National Primary Care Centre, Keele University. *Musculoskeletal Matters: Bulletin 1* 2009.
12. Jordan KP, Kadam UT, Hayward R, Porcheret M, Young C, Croft P. Annual consultation prevalence of regional musculoskeletal problems in primary care: An observational study. *BMC Musculoskelet Disord*. 2010; 11(1): 144.
13. Arthritis Research UK National Primary Care Centre, Keele University. *Musculoskeletal Matters: Bulletin 2* 2009.

14. Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2016.
15. NHS Digital. Hospital Admitted Patient Care Activity, 2016-17.
16. The Patients' Association. Feeling the Wait-Waiting Times Report 2016.
17. Dubin R, Flannery J, Taenzer P, Smith A, Smith K, Fabico R, et al. ECHO Ontario chronic pain & opioid stewardship: Providing access and building capacity for primary care providers in underserved, rural, and remote communities. *Stud Health Technol Inform.* 2015;209: 15-22.
18. C, Crawford A, Serhal E, Kurdyak P, Sockalingam S. The impact of project ECHO on participant and patient outcomes: A systematic review. *Academic Medicine.* 2016;91(10): 1439-1461.
19. James SL, Abate D, Abate KH, et al., GBD 2017 disease and injury incidence and prevalence collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018 11 10;392(10159):1789-858.
20. Chegade MJ, Gill TK, Kopansky-Giles D, et al. Building multidisciplinary health workforce capacity to support the implementation of integrated, people-centres Models of Care for musculoskeletal health. *BPRCR* 2016;30:559-84.
21. Dominick CH, Blyth FM, Nicholas MK. Unpacking the burden: understanding the relationships between chronic pain and comorbidity in the general population. *Pain* 2012;153(2):293-304.
22. Greenhalgh T, Robert G, Bate P, et al. How to spread good ideas. A systematic review of the literature on diffusion, dissemination and sustainability of innovations in health service delivery and organisation. In: Report for the national Co-ordinating centre for NHS service delivery and organisation R&D (NCCSDO). London: University College London; 2004.
23. Greenhalgh T, Robert G, Macfarlane F, et al. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q* 2004;82:581-629.
24. World Health Organization. Global strategy on human resources for health: workforce 2030. WHO; 2016, ISBN 978 92 4 151113 1. <https://apps.who.int/iris/bitstream/handle/10665/250368/9789241511131-eng.pdf?sequence=1>. [Accessed 15 September 2022].
25. Britnell M. Human: solving the global workforce crisis in healthcare. Oxford Scholar; 2019.
26. Johnson KL, Hertz D, Stobbe G, Alschuler K, Kalb R, Alexander KS, et al. Project Extension for Community Healthcare Outcomes (ECHO) in multiple sclerosis: increasing clinician capacity. *Int J MS Care.* 2017;19(6): 283-289
27. Griffiths M, Miller H. E-mentoring: Does it have a place in medicine? *Postgrad Med J.* 2005;81: 389-390.
28. Bouchonville MF, Hager BW, Kirk JB, Qualls CR, Arora S. Endo echo improves primary care provider and community health worker self-efficacy in complex diabetes management in medically underserved communities. *Endocr Pract.* 2018;24(1): 40-46.
29. Wood BR, Unruh KT, Martinez-Paz N, Annese M, Ramers CB, Harrington RD, et al. Impact of a telehealth program that delivers remote consultation and longitudinal mentorship to community HIV providers. *Open Forum Infect Dis.* 2016; 3(3): 1-9.
30. Mahmud A, Kettle C, Bick D, Rowley C, Rathod T, Belcher J, et al. The development and validation of an

- internet-based training package for the management of perineal trauma following childbirth: Maternity PEARLS. *Postgrad Med J.* 2013; 89(1053): 382-389.
31. Abdulabbas H. S., Abed S. Y., Mahdi Z. A.A., Al-Hindy, H. A.A. M., Akram M., Laila U., Zainab R., Al-Khafaji, N. S., Al-Dahmoshi, H. O., & Chabuck, Z. A. G. Antiviral effects of medicinal plants: Minireview. *Journal of Medical Research and Health Sciences*, 2023; 6(2): 2424–2429.