Developing a Core Outcome Set for Community and Primary Care Musculoskeletal Services: A Consensus Approach

# Introduction

Musculoskeletal (MSK) pain conditions are one of the largest disease groups (alongside mental health disorders) contributing to years lived with disability internationally (Vos et al., 2017). Over eighteen million people in the UK suffered with a musculoskeletal (MSK) disorder in 2017 (Versus Arthritis, 2019) and the cost to the UK NHS is estimated at £5 billion each year (Briggs, 2020). Currently there is a mismatch between the increasing societal burden of MSK pain conditions, and the appropriate health policy response (Blyth et al., 2019).

Tackling unwarranted variation was highlighted as a priority objective within the NHS Mandate (NHS England, 2018) and Five Year Forward View (NHS England, 2015) aiming to reduce the ‘unacceptable’ care and quality gap. Reducing health inequalities has also been identified as a core objective as part of restoring MSK services in the wake of COVID-19, with optimal use of indicators and metrics warranted to continuously monitor effectiveness and capture patient feedback during this period of unprecedented change (NHS England, 2020a).

Arthritis Research UK published a specific MSK Recommended Indicator Set in 2016 (ARUK, 2016). This indicator set defines a shared UK MSK vision, and reflects agreed objectives for MSK health systems; ensuring comparisons in care are made over time, providing information on quality, and supporting quality improvement initiatives both locally and nationally (ARUK, 2016). Specific data capture across the MSK health system was envisaged to enable and support quality improvement in areas such as; early diagnosis, the delivery of coordinated care, and self-management (ARUK, 2016).

A number of national audits are already in place in the UK to capture this data in specific areas outlined within the indicator set, such as; the National Early Inflammatory Arthritis Audit (NEIAA) in the area of ‘Rheumatoid Arthritis’ (BSR, 2019), the National Hip Fracture Database (NHFD) for the area of ‘Fragility Fractures’ (RCP, 2019), the National PROMs Programme hip and knee data for the area of ‘Osteoarthritis’ (NHS England, 2020b), with additional data on prevalence and costs reported and compared by NHS RightCare in MSK focus packs (NHS RightCare, 2019). The area however where there is no national audit or dataset to provide comparative data is within community and primary care management of non-inflammatory, non-surgical MSK conditions. For these non-surgical, non-inflammatory patients at present, we do not have continuous national data to support the indicators listed under ‘Musculoskeletal Health Outcomes’ within the Versus Arthritis Indicator set. This includes data on health gain (MSK-HQ), or utility scores (EQ5D), or other key metrics such as the percentage of patients whose work is affected by MSK conditions, and the satisfaction of patients treated for MSK conditions in this setting (ARUK, 2016).

A recent evaluation of First Contact Physiotherapy services in primary care commissioned by the Chartered Society of Physiotherapy (CSP) was a first step towards a national audit of MSK primary care services (CSP, 2020). Developing methodology for routine continuous collection of MSK metrics however was not an objective of the project. Findings from this evaluation therefore need to be taken alongside additional research studies and embedded routine data collections to develop this, in order to allow for a successful benchmarking/audit tool for the future.

A number of core outcome sets (COS) exist for specific MSK conditions and are listed on the COMET database (COMET, 2020). No COS however to the author’s knowledge exists encompassing all MSK conditions for use in routine clinical practice within a community or primary care setting. This study therefore aims to gain consensus across the UK on the standardised data that would need to be included in a community and primary care MSK wide national data collection. Results will be used to develop recommendations to inform a future national MSK audit.

Metrics for consideration within this COS will include variables needed to: 1. Case-mix adjust data in order to make fair comparisons between outcomes achieved (Burgess et al., 2019); 2. Describe the population in order to identify unwarranted variation between patient groups (e.g. age, ethnicity, gender); 3. Identify treatment effect including use of Patient Reported Outcome Measures (PROMs); 4. Capture patient satisfaction including use of Patient Reported Experience Measures (PREMs); 5. Monitor effective implementation of best practice recommendations including NICE guidelines and other MSK Indicators; and 6. Allow for costing of MSK services using key MSK cost drivers (Burgess et al., 2020a).

## Objectives:

**Primary Objective:** To gain consensus on a proposed set of metrics that could be used to develop a COS for use in routine practice in community and primary care MSK services in the UK. This dataset needs to be considered feasible and appropriate for collection by clinicians in clinical systems, and feasible and appropriate to patients who will provide the majority of the data in the form of questionnaires to be collected and collated by individual MSK services.

**Secondary Objective:** The secondary objective is to aid development of methodology for a national audit of community and primary care MSK services.

# Methods

## Ethical Approval:

Ethical approval for the study was granted by the University’s Faculty of Medicine and Health Sciences Research Ethics Committee (REC reference: MH-200141)

## Guidelines:

The MSK COS development followed recommendations set out by the COS-STAD team (Kirkham et al., 2017) (<https://doi.org/10.1371/journal.pmed.1002447.t002>)

The MSK COS development was also listed a priori on the COMET (Core Outcomes Sets for Effectiveness Trials) database (<http://www.comet-initiative.org/Studies/Details/1551>).

## Consensus Overview

We conducted a consensus process involving researchers, healthcare professionals and patients which started with multiple reviews of related literature by the research team to generate an initial list of proposed metrics. This proposal was then taken to wider stakeholder consensus via an online survey.

**Domain 1: Scope**

The key objective of the MSK COS development is to provide clear guidance to the MSK community on which generic (MSK wide) metrics and outcomes should be collected as a minimum in routine clinical practice across the UK (see **Table 1** for detail on scope).

### Table 1: Scope, stakeholders, and consensus process, following COS-STAD standards for development

**Domain 2: Stakeholders**

**T**he stakeholders involved in developing and providing feedback for the consensus study are outlined in **Table 1**. Inclusion of researchers, healthcare professionals and patients is required as a minimum by the COS-STAD recommendations (Kirkham et al., 2017)**.**

The aim was to recruit a minimum of 100 healthcare professionals (clinicians, managers, MSK programme leads) including representation from across the UK and across professional groups. The study also aimed to recruit a minimum of 25 patients in order to gain essential feedback on feasibility and acceptability of a proposed patient questionnaire to patients using MSK services. This was a pragmatic choice like many similar consensus studies with the main aim of ensuring representation across stakeholder groups (Williamson et al., 2017).

**Domain 3: Consensus Process**

The consensus process was developed following standards set out by Kirkham et al (Kirkham et al., 2017) (see **Table 1**)

**Consensus Stage 1: Preliminary COS Recommendations**

Three published reviews have been undertaken by the research team to develop preliminary recommendations on the content of the MSK COS. These include; a systematic review of MSK case-mix adjustment models and an umbrella review of predictors of MSK outcome to identify variables necessary to adjust MSK data in order to make fair comparisons (Burgess et al., 2019, 2020b), and a review of economic analyses in MSK community and primary care to identify key cost drivers of MSK healthcare provision (Burgess et al., 2020a). Additional national recommendations and guidance and other identified condition specific COS have also been reviewed to form an initial proposal that formed the basis for the consensus process (ARUK, 2016, NHS England 2020b, CSP, 2020, NICE, 2016, COMET, 2020, ICHOM, 2020a 2020b, NHS England, 2019a 2019b).

The proposed mandatory and optional metrics are shown below in **Table 2** and the full explanatory document and proposed coding can be viewed as supplementary material (**S1** and **S2**).

### Table 2: Proposed Mandatory and Optional Variables

**Consensus Stage 2: Development of online survey relating to candidate metrics/outcome measures**

**Survey:** A single online self-administered survey was developed using Lime Health Survey software provided by Keele University. The survey was designed to take no more than 30 minutes for health professionals or patients to complete. Respondents were signposted to the appropriate questions (healthcare professional or patient/service user) dependent on their responses to initial questions. Please see **Supplement 3 (S3)** for full survey content. The survey was designed to gauge opinion from healthcare professionals on the importance of the proposed metrics/outcomes for inclusion in a standardised dataset and to gain information on current practice in capturing MSK data, alongside feasibility to implement a standardised COS in clinical practice. The patient arm of the questionnaire displayed the proposed questionnaire that would be needed to capture key metrics and outcomes to patient participants. This was displayed in sections using video clips. Participants were then asked for their feedback on their ability to understand questions, whether anything important to them was missing and if they would be happy providing this type of data via questionnaire in routine MSK care.

**Confidentiality:** The survey was fully anonymised so that no identifiable information was collected or retained within the Health Survey software.

**Right to Withdraw:** Respondents had the right to withdraw at any time and if they did so without completing the survey then their results were excluded from the analysis.

**Consensus Stage 3: Stakeholder engagement:**

Email invitations were sent to health professionals who had contacted the research team a priori who had expressed interest in the project, and to professional networks with expertise in this area.

Communications: the survey invitation and link was also included in the Versus Arthritis e-bulletin Network News in September 2020 (distribution n=7000), and invites were posted on social media (Twitter/Linked In) by the research team. The survey detail and link were also added to an e-bulletin for the University Research User Group (RUG) to facilitate further patient/service user uptake.

Software settings prevented the completion of the survey multiple times from the same internet location in order to limit the number of responses from the same individual.

### Consent

Consent was implied through participants clicking on the link to the survey and after viewing the introduction videos continuing to the next page to start the survey questions. Any incomplete surveys were excluded, giving participants the chance to withdraw at any point up to submitting the survey. Patient information leaflets were also provided.

### Stage 4: Analysis Plan

**Data Analysis:** questions and responses to the survey were numbered and coded within the Keele Health Survey software, and on completion of data collection the anonymised data was exported to Microsoft Excel for collation and analysis.

**Determining scoring system/definition of consensus determined a priori:** Frequency counts for each question were analysed. Consensus was defined a priori as agreement from at least 70% of the voting participants/stakeholders as supported by the COS-STAD development group (Kirkham et al, 2017).

**Criteria for inclusion/exclusion of outcomes/metrics:** Inclusion/exclusion of metrics/outcome tools was decided through analysis of how participants rated metrics (extremely important, very important, moderately important, neutral, slightly important, low importance, not at all important) (Vagias, 2006), and the 70% pre-determined agreement level, alongside supporting questions on feasibility, and on patient feedback and comments on the proposed patient questionnaire. Analysis involved calculating the percentage of health professionals that rated a metric as extremely or very important, this was deemed as strong consensus support if above the 70% pre-defined level, and calculating the percentage of respondents who rated the metric as extremely, very or moderately important, if this was above 70% but did not meet the strong consensus category then this was rated as moderate consensus. The strong consensus metrics would then be used to inform the mandatory metrics and the moderate consensus to help inform mandatory and optional metrics supported by feedback from patients and healthcare professionals. The objective of the consensus process was to reduce rather than increase metrics from those listed but opportunity was given for both healthcare professionals and patients to list anything else important to them that they felt was missing. If a category such as demographics, clinical factors etc had no metric that met strong consensus then the highest scoring metric was considered for inclusion within the mandated set.

## Results

**Response rates:**

There were 199 complete surveys (166 healthcare professionals and 33 patients) collected between September 2020 and January 2021, and 221 incomplete surveys which were automatically excluded from the analysis as this was deemed as not consenting to participate (see consent section above).

There was good spread across the UK with highest uptake from the Midlands (24%) and South East (23%) and lowest uptake from outside the UK (4%), and the North East (5%) (see **Figure 1**).

### Figure 1: Uptake of survey across the UK

**Health Professional Survey**

The majority of healthcare professional respondents were Physiotherapists and of those most worked in the NHS (**Table 3**). Of the 17 that classed themselves as ‘other’, professional backgrounds included; MSK researcher, Orthopaedic Surgeon, Sports Medicine Specialist, Podiatrists, Director of MSK Services, Osteopath, Massage/Pain therapist and a Podiatric Surgeon.

### Table 3: Demographics of survey respondents

Results for healthcare professional consensus on key MSK metrics are shown in **Table 4**. Healthcare professionals were asked to; ‘state how important you feel each metric is for inclusion in the standardised MSK dataset.’ Variables that met strong or moderate consensus are highlighted within consensus columns.

### Table 4: Health Professional Consensus Agreement on MSK Metrics

**Further Questions for Health Professionals**

Additional Metrics:25% of healthcare professionals were collecting additional metrics for MSK patients. There were 39 comments. These mainly focused on PROMs collected in practice with 9 respondents (5.4%) stating they collected the Patient Specific Functional Scale (PSFS) in practice, 2 reported collecting the Brief Pain Inventory (BPI), and other respondents listed a variety of condition specific tools such as the Oxford Hip Score (OHS) and Oxford Knee Score (OKS), the Knee injury and Osteoarthritis Outcome Score (KOOS), the Hip injury and Osteoarthritis Outcome Score (HOOS), the Oswestry Disability Index (ODI) and Neck Disability Index (NDI). Other generic tools mentioned included the Tampa Scale for Kinesiophobia, Measure Yourself Medical Outcome Profile (MYMOP) and STarT Back alongside collection of red and yellow flags.

Collection of Metrics in Routine Practice**:** It can be seen from the results that there is wide variation in how these metrics are currently being collected in practice (**Table 5**). The metrics that are less frequently collected are economic factors and patient experience measures and a significant number of PROMs and PREMs are still being collected on paper.

### Table 5: Metric collection in routine practice

Timing and purpose of metric collection are shown in **Table 6** alongside usefulness of standardised data collection and feasibility of collecting these metrics in practice.

A large amount of MSK healthcare professionals are capturing data at the first appointment for patients (86%) but less at discharge or at a specified time point post treatment (57% in total) and 4% are not collecting at all. Metric collection is largely used for local service evaluation and audit, for monitoring patient progress and to submit as key performance indicators (KPIs) as part of quality reporting to commissioners.

91% of respondents thought that a standardised data collection would be useful to the MSK community to drive improvements in patient care.

40% of respondents thought they could implement the core outcome set developed with a further 57% thinking that they may be able to implement, giving 97% who could potentially take this COS into practice. Comments included; that implementing would take time to setup, it would need to fit with current system setup, it could be implemented if IT systems allowed and metrics could be added to EPR systems/embedded, if digital integrated collection, some had already started using the listed metrics in practice whilst others thought it was very different to what is collected currently in primary care, time was listed as a significant barrier alongside cost of collection and compliance with collection, and organisational support and a national drive to collection were seen as key for successful implementation.

**Patient Survey**

33 patients completed the patient survey. Of these 2 patients were under 18 and therefore were not able to continue with the full survey and a further 6 had not had a recent experience of accessing or receiving care (in the last 12 months) and therefore were also not able to continue with the full survey. 25 patients answered all of the survey questions.

21 patients (84%) had joint, muscle or back symptoms/aches/pains, 2 (8%) were post MSK surgery and 2 (8%) had inflammatory conditions showing highest representation for non-surgical non-inflammatory patients which is the main focus of the COS.

36% of patients stated that they had to fill in a questionnaire before and/or after their appointment/treatment. **Table 7** shows patients views on the proposed questions that would need to be asked to gather data on health condition, work, experience and healthcare visits (see supplementary information for survey detail (**S3**)). Patient comments are included in the appendix.

### Table 7: Patient Views on Proposed Questionnaire

The patient survey showed that the majority of respondents (92-96%) found the proposed questions needed to collect data for the COS to be easy to understand, and there were very few questions included that patients felt they would be unhappy to fill in/share. The only areas that patients were less confident including were benefit and employment status. A number of patients highlighted that they would have liked more questions around anxiety and depression to capture the impact their MSK condition is having on their mental health and work questions may need to be adapted to consider discomfort at work and to take into consideration time off work due to inhibited function rather than purely due to pain.

Completion of Questionnaires:88% of patients said they would be happy to complete a questionnaire like this when visiting their GP/Physiotherapist about their MSK problem.

Usefulness:88% of patients (22/25) thought that answering questions like this would help guide their clinical consultation (thinking about face to face, telephone and virtual/online experiences). 76% of patients thought that a standardised MSK dataset would be useful to drive improvements in patient care.

## Discussion

Response rates for healthcare professionals exceeded expectations, with uptake widespread across the UK. This supports the interest in and importance of this topic in the current healthcare climate and the need for clear guidance and recommendations to support development of consistent and continuous data capture within the clinical setting.

The metrics that reached a strong level of consensus support for inclusion within a standardised MSK dataset were; **age**, **pain site**, **comorbidities**, **duration of symptoms**, **work status**, **work absence**, **work absence duration**, PREMS; **VPAI** (care and respect and understood and valued), **FFT**, **confidence in clinical competence**, **CollaboRATE** (shared decision making), **given sufficient information**, **global improvement**, **understanding health condition** (MSK-HQ Q12), and **confidence to manage yourself** (MSK-HQ Q13). No PROMs or economic factors met strong consensus.

The additional metrics which reached moderate consensus were; **sex**, **ethnicity**, **previous surgery**, **self-reported as disabled**, **previous physiotherapy**, **benefit status**, **MSK-HQ**, **NPRS**, **STarT MSK**, patient experience domain of **timeliness and convenience**, and economic factors of **health utilisation**, **investigations and treatments**, **inpatient stays** and **prescription medications**.

Metrics which did not meet strong or moderate consensus were; education, assisted with questionnaire and the EQ5D5L. Education and assistance with questionnaire are both potential variables for use in case-mix adjustment models (Burgess et al, 2019, 2020b), but are not feasible for inclusion in modelling if there is minimal support to collect them in routine practice. The EQ5D5L is a widely used health status measure for clinical and economic appraisal (EuroQol, 2021). Price et al., (2019) showed that it is not as responsive as the MSK-HQ in MSK patients. Unlike other tools however it allows for the calculation of QALYs (Quality Adjusted Life Years) for use in health economic analyses (Euroqol, 2021) which is a limitation to exclusion.

In the initial evidence informed list of metrics both the MSK-HQ and pain intensity (NPRS) were part of the mandated recommendation. None of the included functional status metrics/PROMs reached strong consensus. MSK-HQ however achieved the highest consensus, reaching 63% agreement (extremely important/very important) and 84% agreement at the moderate level (extremely important/very important/moderately important) and had strong consensus for inclusion within patient experience metrics (Q12 and Q13). It is essential that a standardised PROM is part of the dataset and based on these results the inclusion of the MSK-HQ is recommended. The PSFS was also listed by 5% of healthcare professionals as part of their current MSK metric collection. This tool is similar to the MSK-HQ in the way that it is a generic PROM applicable to a number of conditions, but it also allows for patients to identify specific activities that they are finding difficult due to their condition (Stratford et al, 1995). The addition of this PROM as an optional metric may therefore be useful.

Collection of MSK metrics currently is highly varied, with different metrics collected at different time points in different ways. Without standardisation of which metrics are collected and at which time-points in routine care, making comparisons in patient outcome with regards to quality and benchmarking is difficult. Baseline patient factors are necessary for case-mix adjustment in order to adjust for varying complexity across providers and allow for fair comparison. It is important that factors used for this purpose are simple to extract from electronic medical records or to collect from patients for this to be feasibly undertaken in routine practice. From previous evidence the most predictive patient factors of MSK functional outcome widely used in case-mix adjustment are; baseline PROM score, comorbidities, age, disability, duration of symptoms, employment/work absence, surgical history, and socio-economic status (Burgess et al, 2019, 2020b). Of these, age, comorbidities, duration of symptoms, and employment/work absence reached strong consensus for inclusion within an MSK COS. Baseline PROM score would also need to be included for the outcome adjusted within a case-mix model.

Seventeen percent of respondents reported not collecting any PROMs and 26% not collecting any PREMs which shows that there is significant work needed to support the use of PROMs and PREMs in routine MSK care and to develop the infrastructure to consistently collect an MSK COS as part of routine practice. Barriers to current and future collection included IT infrastructure and integration of digital systems, time, resources, and support from managers/organisation/stakeholders. Comments from both healthcare professionals and patients included needing to clearly demonstrate the use of the data as too often questionnaires are collected but not used by clinicians to support clinical decision making or fed back to staff or stakeholders with regards to the quality of care delivered. It is therefore clear that stakeholders would want to see the value realised with collecting this core set of data with demonstrable improvements in patient care.

The collection of PREMs was clearly seen as a high priority by clinicians reflected in the fact that 9 out of 10 PREM domains met strong consensus for inclusion making up a significant proportion of those metrics with strong consensus. Interestingly clinicians did not see ‘timeliness and convenience’ as such an important domain, this may be because they feel this area is beyond their control as clinicians and is a metric more focused to system setup. Patients however felt that another system focused metric around access to care was an important metric to consider for inclusion.

Other general comments included the difficulty currently in accessing face to face physiotherapy care due to the COVID-19 pandemic and how difficult it is to ask questions to clinicians following reflection on appointments due to the pressure from clinicians to discharge. Digital platforms and apps offer an opportunity to improve communication channels between patients and clinicians and could offer significant support with current pressures on face to face delivery of care, and as services adapt and develop in the future with further digital innovation and integration.

**Strengths and Limitations**

Strengths: The strengths of this study were that the aims to develop consensus, the method of a single round survey, participant engagement, and the consensus definition were all determined a priori meeting the COS-STAD and Delphi quality criteria/recommendations (Kirkham et al, 2017, Diamond et al, 2014). Failure to adequately define and use clear criteria for consensus can challenge the notion of consensus itself (Diamond et al, 2014).

Limitations: The survey was limited to the English language and to digitally literate respondents. A large number of incomplete questionnaires (221) were excluded from the analysis. Inviting and encouraging respondents to view online surveys is relatively easy but the capture of complete data is far more challenging (McRobert et al., 2018) as was demonstrated within this study. Another potential limitation is the use of a single round online survey rather than a conventional multiple round Delphi survey where initial consensus findings are then presented back to respondents for further ratification. The COMET guidelines discuss the variation in approaches to COS development and have identified that further methodological guidance on the optimal approach would be helpful (Williamson et al., 2017). Results for this consensus study will need to be discussed with national policy makers to identify if any variables that met moderate but not strong consensus such as ethnicity are deemed essential as part of national reporting and therefore would need to be included within the final recommendation.

**Conclusion**

Seven baseline patient factors reached strong consensus for inclusion into an MSK COS for use in community and primary care MSK services alongside an MSK PROM. From the generic PROMs included the MSK-HQ reached the highest level of support and is therefore recommended for inclusion. Nine out of ten patient experience measures had strong consensus agreement showing the importance clinicians place on capturing information on all aspects of patient care. Interestingly collection of PREMs although strongly supported for collection using a number of metrics was the main area that was not consistently being collected in current practice. Moderate consensus support was also reached for collection of a significant number of additional factors in each category. Items that could be removed from the list following the consensus process include; education, assistance with questionnaire, and the EQ-5D. Further consideration needs to be given to the wording around work metrics and to the inclusion of a mental health metric following patient feedback.

There was overwhelming support from healthcare professionals and patients that standardising data collection in this way would improve patient care. Further work is needed to set out the specific detail of the agreed COS which will be presented in a separate paper, supported by; testing of a feasible case-mix model, how and when to collect agreed metrics including specific wording of questions for patients, and how to utilise this data effectively for service evaluation, audit, benchmarking and quality improvement.

**Highlights**

* There is strong consensus that standardising MSK data would improve patient care
* Most patients surveyed would be happy to fill in pre/post treatment questionnaires
* The MSK-HQ was the preferred generic PROM
* Nine PREM domains reached strong consensus
* Age, pain site, comorbidities, duration of symptoms, and work metrics are important

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**Conflict of Interest Statement**

Declarations of interest: none.

**Contributors**

RB led the project including design, protocol development, data collection/analysis and production of the paper. JH supported through all stages of the study and contributed to writing the paper, ML supported with study design, analysis and revision of the paper, and CM supported design of the consensus survey and gave technical support.

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## Tables:

**Table 1: Scope, stakeholders, and consensus process, following COS-STAD standards for development**

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard Number** | **Domain** | **Methodology (COS-STAD)** | **Detail** |
| **1** | **Scope** | **The research or practice setting(s) in which the COS is to be applied** | UK Community and Primary Care setting for use in routine clinical practice |
| **2** | **Scope** | **The health condition(s) covered by the COS** | All MSK conditions (focus on non-inflammatory, non-surgical) |
| **3** | **Scope** | **The population(s) covered by the COS** | All adult (18 years or over) MSK patients attending for routine MSK care. |
| **4** | **Scope** | **The intervention(s) covered by the COS** | All interventions (focus on non-surgical) |
| **5** | **Stakeholders involved** | **Those who will use the COS in research** | Researcher involvement: The MSK research team at Keele developed the preliminary recommendations based on best evidence and expertise in this area. |
| **6** | **Stakeholders involved** | **Healthcare professionals with experience of**  **patients with the condition** | Survey content specifically designed for healthcare professionals (including physiotherapists, GPs, managers, commissioners and other professionals working within/with MSK community and primary care services) captured views from healthcare professionals. |
| **7** | **Stakeholders involved** | **Patients with the condition or their**  **representatives** | Survey content specifically designed for patients gained feedback on outcome measures and core metrics for potential use in routine clinical practice. |
| **8** | **Consensus process** | **The initial list of outcomes considered both healthcare professionals' and patients' views.** | The survey will have 2 arms, one for healthcare professionals and one specifically to capture patient’s views. |
| **9** | **Consensus process** | **A scoring process and consensus definition were described a priori.** | The scoring process and consensus definition was developed a priori and detailed within the original protocol submitted for ethical approval and outlined below. |
| **10** | **Consensus process** | **Criteria for including/dropping/adding**  **outcomes were described a priori.** | The consensus aimed to reduce and not add outcomes/metrics where possible aiming for a feasible list for routine capture. Criteria for including/dropping metrics were described a priori within the protocol and are outlined below. |
| **11** | **Consensus process** | **Care was taken to avoid ambiguity of language used in the list of outcomes.** | Supporting documentation giving full detail of tools/outcome measures/metrics and abbreviations were included and easily accessible from the survey webpage for all healthcare professionals. The patient survey included video clips to explain all aspects of the proposed survey. |

This Table follows recommendations for reporting by the COS-STAD study team (Kirkham et al., 2017).

**Table 2: Proposed Mandatory and Optional Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable Name** | **Response Options** | **Capture Point** | **Justification** |
| **Mandatory Variables** |  |  |  |
| **Demographics** |  |  |  |
| Age | Continuous numeric | Baseline | CM/PO review |
| Sex at birth | Binary (male/female) | Baseline | Descriptive |
| Education | Categorical (4 options) | Baseline | CM review |
| Ethnicity | Categorical (5 options) | Baseline | CM review |
| **Baseline Clinical Factors** |  |  |  |
| Pain Site | Categorical (11 options) | Baseline | CM review |
| Comorbidities | Categorical (12 options) | Baseline | CM/PO review |
| Duration of Symptoms | Categorical (5 options) | Baseline | CM/PO review |
| Previous Surgery | Categorical (4 options) | Baseline | CM review |
| Self-Reported as Disabled | Binary (yes/no) | Baseline | CM review |
| **Employment** |  |  |  |
| Work Status | Binary (yes/no) | Baseline and 3 months | VA/FCP |
| Work Absence | Binary (yes/no) | Baseline and 3 months | VA/FCP |
| Work Absence Duration | Categorical (4 options) | Baseline and 3 months | VA/FCP |
| **Functional Status** |  |  |  |
| MSK-HQ (MSK Health Status) | Questionnaire (15 questions) | Baseline and 3 months | VA/FCP |
| Pain Intensity (NPRS) | Numeric (0-10) | Baseline and 3 months | PO review |
| **Patient Reported Experience** |  |  |  |
| Friends and Family Test (FFT) | Questionnaire (2 questions) | 3 months | NHSE |
| Global Change in Health Status | Categorical (6 options) | 3 months | FCP |
| **Optional Variables** |  |  |  |
| **Baseline Clinical Factors** |  |  |  |
| Previous Physiotherapy | Binary (yes/no) | Baseline | CM review |
| Assisted with Questionnaire | Binary (yes/no) | Baseline | CM review |
| **Employment** |  |  |  |
| Benefit Status | Categorical (12 options) | Baseline | CM/PO review |
| **Functional Status** |  |  |  |
| STarT MSK (Risk Status) | Questionnaire (10 questions) | Baseline | NICE |
| EQ5D5L (QOL) | Questionnaire (5 questions) | Baseline and 3 months | VA |
| **Patient Reported Experience** |  |  |  |
| *Valuing Patients as Individuals*  -Care and Respect  -Understanding & Engagement | Questionnaire (6 questions) | 3 months | FCP |
| *CollaboRATE*  -Shared Decision making | Questionnaire (3 questions) | 3 months | NHSE |
| *MSK Indicators*  -Clinical Competence  -Sufficient Information | 2 questions | 3 months | FCP |
| **Economic Factors** |  |  |  |
| Healthcare Utilisation | Free text numeric | 3 months | HE review/FCP |
| Investigations and Treatments | Free text numeric | 3 months | HE review/FCP |
| Inpatient Stays | Free text numeric | 3 months | HE review/FCP |
| Prescribed Medication | Binary (yes/no) | 3 months | HE/CM review |

CM; case-mix adjustment review, FCP; First Contact Physiotherapist National Evaluation, HE; health economics review, NHSE; NHS England, NICE; National Institute for Clinical Excellence LBP guidelines, PO; predictors of outcome review, VA; Versus Arthritis MSK Indicators, . (References: ARUK, 2016, NHS England 2020b, CSP, 2020, NICE, 2016, COMET, 2020, ICHOM, 2020a 2020b, NHS England, 2019a 2019b)

**Table 3: Demographics of survey respondents:**

|  |  |  |
| --- | --- | --- |
| **What is your professional background?** |  |  |
| Answer | Count | Percentage |
| GP | 10 | 6.02% |
| FCP (First Contact Physiotherapist) | 46 | 27.71% |
| Physiotherapist (NHS) | 98 | 59.04% |
| Physiotherapist (Private Organisation/Practice) | 15 | 9.04% |
| Physiotherapist (MOD) | 6 | 3.61% |
| MSK Service Manager | 19 | 11.45% |
| Other | 17 | 10.24% |

Note: respondents could tick more than one answer

**Table 4: Health Professional Consensus Agreement on MSK Metrics**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  | **Consensus** | |
|  | Extremely Important | Very Important | Moderately Important | Neutral | Slightly Important | Low Importance | Not at all Important | Strong consensus | Moderate consensus |
| **Demographics** |  |  |  |  |  |  |  |  |  |
| Age | 54.2 | 29.5 | 12.1 | 2.4 | 1.2 | 0.6 | 0 | 83.7 | 95.8 |
| Sex | 34.3 | 27.1 | 24.7 | 10.2 | 2.4 | 1.2 | 0 | 61.4 | 86.1 |
| Education | 10.8 | 22.3 | 30.1 | 22.9 | 5.4 | 6.6 | 1.8 | 33.1 | 63.2 |
| Ethnicity | 20.5 | 21.7 | 31.3 | 15.1 | 4.2 | 4.2 | 3.0 | 42.2 | 73.5 |
| **Clinical Factors** |  |  |  |  |  |  |  |  |  |
| Pain site | 61.5 | 27.1 | 9.0 | 1.2 | 1.2 | 0 | 0 | 88.6 | 97.6 |
| Comorbidities | 53.0 | 38.6 | 8.4 | 0 | 0 | 0 | 0 | 91.6 | 100 |
| Duration of symptoms | 54.8 | 36.8 | 6.6 | 1.8 | 0 | 0 | 0 | 91.6 | 98.2 |
| Previous surgery | 26.5 | 36.1 | 27.1 | 4.8 | 4.8 | 0.6 | 0 | 62.6 | 89.7 |
| Self-reported as disabled | 29.5 | 34.9 | 20.5 | 9.6 | 3.6 | 1.8 | 0 | 64.4 | 84.9 |
| Previous physiotherapy | 20.5 | 34.9 | 30.1 | 6.6 | 5.4 | 2.4 | 0 | 55.4 | 85.5 |
| Assisted with questionnaire | 14.5 | 17.5 | 27.1 | 24.1 | 5.4 | 10.8 | 0.6 | 32.0 | 59.1 |
| **Employment** |  |  |  |  |  |  |  |  |  |
| Work status | 38.0 | 38.6 | 18.1 | 3.0 | 1.8 | 0.6 | 0 | 77.6 | 94.7 |
| Work absence | 37.4 | 39.2 | 18.1 | 3.0 | 2.4 | 0 | 0 | 77.6 | 94.7 |
| Work absence duration | 30.1 | 42.8 | 20.5 | 1.8 | 3.6 | 1.2 | 0 | 72.9 | 93.4 |
| Benefit status | 15.1 | 33.1 | 33.1 | 12.1 | 1.8 | 3.6 | 1.2 | 48.2 | 81.3 |
| **Functional Status/PROMs** |  |  |  |  |  |  |  |  |  |
| MSK-HQ | 30.1 | 31.9 | 21.7 | 11.5 | 1.8 | 1.8 | 1.2 | 62.0 | 83.7 |
| NPRS | 24.7 | 27.1 | 30.1 | 10.8 | 2.4 | 3.0 | 1.8 | 51.8 | 81.9 |
| STarT MSK | 20.5 | 38.6 | 20.5 | 12.1 | 2.4 | 3.6 | 2.4 | 59.1 | 79.6 |
| EQ-5D-5L | 9.6 | 22.9 | 26.5 | 23.5 | 3.0 | 6.6 | 7.8 | 32.5 | 59.0 |
| **Patient Experience/PREMs** |  |  |  |  |  |  |  |  |  |
| VPAI Care and Respect | 47.0 | 38.6 | 6.6 | 4.2 | 0.6 | 1.8 | 1.2 | 86.6 | 92.2 |
| VPAI Understood and Valued | 48.8 | 37.4 | 7.2 | 4.2 | 0 | 1.8 | 0.6 | 86.2 | 93.4 |
| FFT | 31.9 | 44.0 | 13.3 | 7.2 | 1.2 | 1.2 | 1.2 | 75.9 | 89.2 |
| Confidence in clinical competence | 41.0 | 32.5 | 15.1 | 6.6 | 1.8 | 1.8 | 1.2 | 73.5 | 88.6 |
| CollaboRATE/Shared decision making | 39.7 | 40.4 | 10.8 | 6.0 | 1.2 | 0.6 | 1.2 | 80.1 | 90.9 |
| Given sufficient information | 35.5 | 40.4 | 12.1 | 9.0 | 0.6 | 1.2 | 1.2 | 75.9 | 88.0 |
| Global improvement | 31.9 | 41.0 | 16.3 | 7.8 | 1.2 | 0.6 | 1.2 | 72.9 | 89.2 |
| Understanding of health condition | 37.4 | 42.2 | 13.3 | 5.4 | 0 | 0.6 | 1.2 | 79.6 | 92.9 |
| Confidence to manage yourself | 48.8 | 36.1 | 10.2 | 3.0 | 0 | 0.6 | 1.2 | 84.9 | 95.1 |
| Timeliness and Convenience | 17.5 | 36.1 | 31.9 | 10.2 | 3.0 | 0.6 | 0.6 | 53.6 | 85.5 |
| **Economic Factors** |  |  |  |  |  |  |  |  |  |
| Health utilisation | 19.9 | 36.8 | 30.1 | 10.2 | 1.2 | 1.2 | 0.6 | 56.7 | 86.8 |
| Investigations and treatments | 22.9 | 43.4 | 24.1 | 6.0 | 3.0 | 0.6 | 0 | 66.3 | 90.4 |
| Inpatient stays | 6.6 | 27.7 | 40.4 | 14.5 | 6.6 | 3.6 | 0.6 | 34.3 | 74.7 |
| Prescribed medication | 27.7 | 38.6 | 29.5 | 3.0 | 1.2 | 0 | 0 | 66.3 | 95.8 |
| FFT; Friends and Family Test, MSK-HQ; Musculoskeletal Health Questionnaire, NPRS; Numeric Pain Rating Scale, VPAI; Valuing Patients as Individuals. | | | | | | | |  |  |

**Table 5: Metric collection in routine practice**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **How are you collecting these metrics? (%)** | | | | |
|  | On paper | Through Electronic Patient Record (EPR) | Through electronic platform/app (not EPR) | Not collecting |
| **Demographics** | 14.5 | 65.7 | 12.1 | 7.8 |
| **Clinical Factors** | 21.7 | 59.0 | 11.5 | 7.8 |
| **Employment** | 17.5 | 53.6 | 12.0 | 16.6 |
| **Functional Status/PROMs** | 25.9 | 44.6 | 12.7 | 16.9 |
| **Patient Experience/PREMs** | 30.7 | 24.1 | 19.9 | 25.3 |
| **Economic Factors** | 13.9 | 44.0 | 9.0 | 33.1 |

**Table 6: Healthcare Professional Views on Metric Collection**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **When are you collecting these metrics?** | | |  |  |
| Answer | | | Count | Percentage |
| At referral | | | 68 | 40.96% |
| When appointed | | | 24 | 14.46% |
| At first appointment | | | 143 | 86.14% |
| At discharge | | | 65 | 39.16% |
| At certain time point post treatment | | | 30 | 18.07% |
| Not collecting | | | 6 | 3.61% |
| Other | | | 6 | 3.61% |
| **What do you currently use these metrics/data for?** | | |  |  |
| Answer | | | Count | Percentage |
| Monitor patient progress | | | 107 | 64.46% |
| Provide patient summary of progress | | | 59 | 35.54% |
| Communicate patient progress with clinical teams | | | 62 | 37.35% |
| Local service evaluation | | | 104 | 62.65% |
| Local audit | | | 98 | 59.04% |
| Research projects | | | 30 | 18.07% |
| Benchmarking with other services | | | 24 | 14.46% |
| As Key Performance Indicators (KPIs) to report to CCG | | | 72 | 43.37% |
| To evaluate resource use | | | 30 | 18.07% |
| None of the above | | | 11 | 6.63% |
| **Do you feel that standardised data collection to allow for national benchmarking of MSK community and primary care services would be useful to the MSK community to help drive improvements in care for MSK patients?** | | | | |
| Answer | | Count | | Percentage |
| Very Useful | | 106 | | 63.86% |
| Useful | | 45 | | 27.11% |
| Unsure | | 11 | | 6.63% |
| Not Useful | | 4 | | 2.41% |
| Not Useful at all | | 0 | | 0.00% |
| **Would you be able to implement our Keele standardised MSK dataset/core outcome set collection within your service/practice?** | | | | |
| Answer | Count | | | Percentage |
| Yes | 66 | | | 39.76% |
| No | 6 | | | 3.61% |
| Maybe | 94 | | | 56.63% |
| Comments | 47 | | | 28.31% |

**Table 7: Patient Views on Proposed Questionnaire**

|  |  |  |  |
| --- | --- | --- | --- |
| **Questions (% Yes)** | **Were these questions easy to understand** | **Was there anything included in this section that you would be unhappy to share** | **In this section is there anything you feel is missing** |
| **Survey Sections** |  |  |  |
| About your condition | 92% | 4% | 56% |
| About your work | 92% | 8% | 32% |
| About your experience | 92% | 4% | 24% |
| About your healthcare visits | 96% | 4% | 16% |

## Figures

**Figure 1: Uptake of survey across the UK**

## Appendix 1

**Key Patient comments:**

**About your condition:**

*Easy to understand:*

‘Really clear and flows well’

‘Easy to understand’

‘They were very straight forward and the sort of thing that I would want the physio to know before talking to me.’

*Anything missing:*

‘You could expand on emotional well being as this impacts on pain perception and coping strategies’

‘Interesting that there are questions about surgery but not about pain relief with medicines or injections’

‘Did you ask if I had had any blood tests for inflammatory disorders…, also previous injury - falls set off my arthritis’

‘Living with pain and particularly long term pain causes mental distress. I am unsure if your questionnaire sufficiently picks this up and I believe it is important.’

‘Have you previously had any investigations relating to and or a specific diagnosis for the condition’

‘How does your pain effect your day to day life.’

‘The whole assessment is not targeted for people with conditions. It is for injuries’

‘Emotional well being not really considered ie anxiety Chronic pain impact on mood and depression.’

**About your work:**

*Anything that you are not happy to share:*

‘Some patients feel a sense of distrust as for some people who claim benefit are reluctant to answer some of those questions as they feel judged.’

‘Finances or employment status.’

*Anything missing:*

‘I left work due to my MSK Condition, there was nothing covering that’

‘Voluntary work - hours done per week - roles that you do - reviewing applications, working in a charity shop etc’

‘Do you suffer discomfort at work and have you had to ammend your duties?’

‘Not all work is paid. I do two "jobs" neither of which is paid. I am a full time unpaid carer for my disabled son. I am also a part time PhD student…’

‘Given the current sitautation and ability to work from home and not have to mobilise, I may have previously had to be absent, but as I can be at home it reduces the need to be off but not the severity.’

‘Carers allowance is not included under benefits and there is no option to indicate you are an unpaid carer who does not claim benefits either. As the carer of a disabled child, when it’s bad, my MSK condition severely impacts my ability to take care of my child and I have to rely on other family members to take care of us both. Therefore, my need for MSK care is as urgent as someone needing to return to paid employment.’

**About your experience**

*Unhappy to share:*

‘In my last initial assessment with MSK - was told that I can expect to be in agony at my age. Given past experience - 2 years earlier - with same MSK I would not feel comfortable completing this honestly in front of the physiotherapist if the experience was bad.’

*Anything missing:*

‘Will the responses be used to influence my personal care or just for feedback?’

‘Are you able to contact the service after the appointment as I always come away with more questions after an appointment once I have thought’

‘The final question on timing could be seen to be ambiguous. Does timing refer to how long you had to wait to get the appointment or the time of day that the appointment was. Does convenience refer to the time of day, the method (face to face or telephone) or the place that the appointment was…’

‘Perhaps you could ask if the clinician was knowable about your condition. Often with chronic conditions the clinician may not know about it and how it would impact treatment’

‘In my recent experience the physiotherapist repeatedly stated that I need further investigation, including imaging to ascertain the extent of the issue, but said they were not able to do this and I needed to go back to my GP. Without a letter from physio, my GP wouldn’t refer and physio ‘don’t do letters’. Something in this section about whether or not you need further care and if this was discussed and planned would be helpful.’

‘Perhaps a question on going forward for patients. What they would like further from their G.P or from the physio department..... Realistic goals to achieve or communicate back to G.P for further action.’

**About you healthcare visits**

‘Will the practitioner actually read it as often you fill in these forms and then when you meet the practitioner it’s as though they have not read it and you have to go through it all again with them’

*Anything missing:*

‘There is no where to give an account of any problems I may have had accessing healthcare’

‘You have a section on overnight stay in hospital, but many surgeries are now done as day surgery with no overnight stay, for instance podiatric surgery. This is an important part of MSK treatment now and would need to be captured as much as overnight stays in hospital.’

**Additional Comments**

‘I would hope that the issue of the effect of pain on my mental health would be included in any consultation with a health care practitioner.’

‘People are unable to get face to face appointments due to Covid-19 and global pandemic. It needs some thought.’

‘I really wish I had been able to fill out this questionnaire. In fact it seems to me the more information you can give the triage service the easier the conversation would be. At the moment there is a brief questionnaire that our service uses for self-referral to physio, but it really doesn't capture the wider picture, it assumes everything is acute and affects a single joint only so is completely useless for people that have long term conditions which may be flaring up.’

‘I would prefer ahead. I have spent 20 minutes filling out forms in pain clinic and seen consultant for 5 minutes.’

‘It's just inconvenient and due to lack of hospital systems linking up. The more time this information needs to be provided the more demoralising it is and that a good continuity of care cannot be provided. It dehumanises the patient’