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Knowledge translation intervention to improve evidence-based practice behaviour of allied health professionals: A cluster randomised controlled trial and 2-year follow-up study

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CHAPTER 7
DISCUSSION

Overview

The aim of this thesis was to measure the effectiveness of a multifaceted KT strategy to change AHPs' EBP behaviour. We measured effectiveness by conducting a cluster RCT in 2009 and a follow-up study 2-years later. This chapter will provide interpretation of the findings along with implications and recommendations for research and practice.

1) Key findings providing a brief summary of the findings from both studies included in the doctoral programme
2) Interpretation and discussion of results regarding EBP behaviour
3) Interpretation and discussion of results regarding EBP knowledge
4) Interpretation and discussion of results regarding EBP attitudes
5) Interpretation and discussion regarding use of the EAS
6) Strengths and limitations of the studies
7) Recommendations for organisations and future research
8) Conclusions.

Key findings

Table 19: Key findings at a glance

Study	EBP behaviour Self-rated (GAS)	EBP behaviour Peer-rated (GAS)	EBP knowledge (exam scores)	EBP attitudes (EBPAS subsets)
RCT	Uncertain*	Uncertain*	Improved	No change**
Follow-up	Improved	Not measured	Not measured	Not measured

* Uncertain = unable to confirm whether or not behaviour improved.

** No change = statistically significant improvement not detected.

Evidence-based practice behaviour

The multifaceted knowledge translation strategy did not result in statistically significant behaviour change over the 8-week RCT period

The KT intervention group in the RCT improved within the study period, but not statistically significantly more than the control group once clustering was accounted for. We consider this null finding to be a possible type II error because our study was underpowered owing to the fact that the number of participants required to account for clustering of EBP behaviours within sites exceeded the number of employees available. Owing to the type II error we remain unsure of the true effect of our KT strategy, but we discovered a number of potentially important findings that may contribute to future KT endeavours and the body of research.

Important findings

Outlying cluster

The high ICCs (ranging from 0.33 to 0.64) for EBP behaviour measures, indicated substantial correlation of behaviours within clusters, and indicated differences in behaviours between clusters. When we examined the mean change scores for each cluster, cluster 3 (who were a part of the control group) showed no statistically significant GAS T-score change from baseline to 8-weeks. Clusters 1 and 2, who received the KT strategy improved their GAS T-scores from baseline to 8-weeks. The remaining cluster (cluster 4, which was part of the control group) was an obvious outlier with the highest baseline GAS T-scores (higher than the post intervention scores of the other clusters receiving the KT intervention), high baseline knowledge scores and increased self- and peer-rated GAS T-scores over the study period.

Variability between natural groupings (such as clinical, departmental or regional) has been noted in the KT literature previously.[15,164] Perhaps the high baseline EBP scores for cluster 4 reflected positive EBP culture and

practices due to cluster 4's manager.[15,83,209] The notion that a manager can strongly influence research culture is by no means new,[89,164] as some opinion leaders are known to strongly influence EBP behaviour.[209,210] Cluster 4's manager was active in promoting EBP behaviour amongst staff. A large range of KT strategies were in place in cluster 4 prior to this study, including policies regarding certain EBP behaviours to be compulsory, audit and feedback, financial incentives, workshops and mentoring. It is conceivable that cluster 4 therefore had both better readiness and receptivity to EBP supports as they had essentially been engaging in active KT for a longer period than the other clusters.[15] That said, positive EBP culture is considered to be related to positive EBP attitudes[89] and EBPAS scores measuring attitude change of cluster 4 were no different from the other clusters at baseline or 8-weeks. This may have reflected measurement error, or may indicate that positive attitudes in cluster 4 were not necessary as mandatory policies within that cluster were the driving force behind the higher GAS scores.

Behaviourally meaningful gains

In the RCT, improvement in EBP behaviour was not statistically significant after adjusting for cluster effect, however similar improvements from peer-ratings suggest possible improvements that were behaviourally meaningful. The 2-year follow-up study adds weight to the notion that the improvement in the RCT was genuine, detecting improvement in EBP behaviour amongst survey participants. The large variability in behaviour observed between clusters in both the RCT and follow-up study suggests barrier assessments and subsequent KT strategies may need to target subgroups within an organisation.

Allied health professional evidence-based practice behaviours improved over a 2-year period

Knowledge translation intervention group at 2-years

Our hypothesis that AHPs' 2-year post KT strategy GAS T-scores would be equal to or statistically significantly greater than the 8-week GAS T-scores

was confirmed (GAS T-score change = 29.58; 95%CI 12.66, 46.52; p = 0.02). This finding needs to be interpreted in light of the small sample in the 2-year group (25/135 original RCT participants responded to the survey, that is 35% of staff who were still employed). It is possible that the higher performers comprised a sizable part of the survey participants, and low responders chose not to do the survey.[207,211] That said, an increase of 29.58 GAS T-score points is considered a clinically significant improvement in EBP behaviour, even if only a portion of AHP staff achieved that level of behaviour change. The fact that EBP behaviour improved over 2-years may mean that there was behaviour change during the RCT that was unable to be detected due to the type II error. Alternatively, it may suggest that EBP behaviours did not improve in the 8-week period but rather took time to improve.[23] This position is supported by the fact that AHPs who received the KT strategy had statistically significantly higher 2-year GAS T-scores than AHPs who were not employed at the time of the KT strategy (93.57 compared to 82.53; p = 0.00).

It is also possible that the high GAS T-scores at 2-years are not representative of the RCT participants, and that the lower performers who did not respond would have lowered the mean score, however we are unable to confirm or deny this.

All survey participants after 2-years

'All survey participants' refers to AHPs who were a part of the RCT (n = 25), as well as AHPs who had joined the organisation since November 2009 (n = 41). The overall GAS T-score (89. 44) was substantially higher than the KT intervention group's 8-week GAS T-score, again suggesting considerable change in EBP behaviour. This however, must be considered in light of the low response rate (44% of all AHPs employed). It is plausible that the improvement in GAS T-scores was partially due to EBP behaviours being embedded in documentation and client processes. These included mandatory use of outcome measures and documentation of level of evidence

used when selecting client treatments. Interestingly, when 2-year GAS T-scores were examined according to the originally allocated clusters, one cluster (cluster 3) had a much lower mean GAS T-score than the other 3 clusters. Clusters 1, 2 and 4 all had GAS T-scores over 91, but cluster 3's GAS T-score was 78. 68. This may have been due to any of the following: (1) the documentation changes not being consistently applied in this cluster, (2) lower performers in this cluster electing to respond to the survey and the sample was therefore not representative of the entire cluster's performance, or (3) the manager of that cluster not leading the change effectively.[209,210] Whatever the reason, this finding suggests that KT strategies may need to be designed for different subgroups within an organisation, as EBP barriers may vary according to natural groupings such as worksite or profession.

Evidence-based practice knowledge

The multifaceted KT strategy improved evidence-based practice knowledge over the 8-week RCT period

Our hypothesis that the KT strategy would improve knowledge was supported with the KT intervention group knowledge exam scores showing a statistically significant improvement compared to the control group. Interestingly, knowledge scores were not affected by the cluster effect. This suggests that although participants within a cluster tend to have similar EBP behaviours, knowledge is not as susceptible to the influences of workplace context and peers. The finding also highlights how much more complex measuring and changing EBP behaviour is compared to EBP knowledge.[16,212] This supports previous KT research findings that changes in knowledge do not always equate to changes in behaviour.[14-16]

Evidence-based practice attitudes

The multifaceted knowledge translation strategy did not change evidence-based practice attitudes over the 8-week RCT period

Our hypothesis that EBP attitudes would improve was not proven correct and thus had to be rejected. Research measuring attitude change is conflicting, with some interventions reporting no change in attitudes[49,149] and other studies reporting improvement in attitudes.[213,214] We postulate the lack of change in EBP attitudes in our study may be explained by:

1) High baseline EBP attitudes, and there was conceivably a ceiling effect on the EBPAS. This was plausible as EBP had been a focus in the organisation for some time prior to the RCT. In this case, positive attitudes at baseline, increased knowledge scores and policy changes may together have resulted in the behaviourally meaningful changes observed. There is however no normative data for AHPs on the EBPAS, so it is difficult to say whether or not baseline attitudes were high compared to AHPs in other organisations.
2) EBPAS subsets potentially not being sensitive enough to detect attitude change and the psychometrics for sensitivity in this population are unknown.
3) The EBPAS being an accurate, sensitive measure and that attitudes did not improve from the KT strategy. This third possibility supports the notion that improved knowledge was not adequate to lead to statistically significant behaviour change, and that a shift in attitudes was also needed.[215] Conversely, the behaviourally meaningful change that was observed potentially bypassed the need for attitude change by employing strategies such as mandatory use of documentation and outcome measures.

4) EBP attitudes taking a longer period of time than knowledge to change, and the 8-week trial was too short to detect change. We were unable to confirm or refute this, as EBP attitudes were not measured at 2-years. Interestingly, KT literature suggests that changing EBP attitudes does not necessarily lead to behaviour change[16] even though there is some evidence suggesting that it is a precursor to behaviour change.[164,215,216]

Use of the evidence alert system

Allied health professionals accessed the Evidence Alert System and found it useful at 8-weeks and 2-years

The RCT demonstrated increased use of our evidence-based resource (the EAS), however we were unable to confirm that this translated to a statistically significant change in EBP behaviour. This supports previous research that detected increased use and perceived usefulness of an evidence-based resource along with no changes in behaviour.[172,203] The 2-year follow-up study suggested that the EAS has continued to be well accessed (25% AHPs use EAS > 1/week; 36. 5% > 1/month). AHPs in study 2 reported that the EAS was almost always useful or often useful 62% of the time, and 27. 8% found it occasionally useful. These results were also in-line with previous research reporting 70-80% usefulness ratings.[203]

Strength and limitations

Strengths

RCT

The cluster RCT had a number of strengths including the rigorous design and broad robust behaviour measurement. Our chosen measurement instrument (GAS) was sensitive to change[90,217] and appeared accurate as self-

and peer-rated scores mirrored each other. Distinguishing features of our study were that we measured a wide set of behaviours amongst AHPs working with people with cerebral palsy. The mix of AHPs in our sample is fairly representative of other community based disability organisations, increasing external validity. This is the first RCT in the KT literature involving social workers, psychologists or occupational therapists.[16] The KT strategy itself was a study strength being based on a solid theoretical model,[51,53,55] in response to a comprehensive barriers assessment, with desired outcomes clearly defined, and included a range of interventions, not only educational interventions.[16]

2-year follow-up study

There were a number of strengths of this study. First, by using GAS as our primary outcome measure, we were able to nest this rigorous tool within a survey, making 2-year follow up feasible. Second, we measured EBP behaviour of a wide range of AHPs over a period of time, that were again a representative mix of AHPs in disability organisations. Third, the survey design enabled the development of additional questions relating to EAS use. Fourth, that data gathered provided important information for the organisation in planning future KT strategies. Fifth, the inherent strength of survey design obtained a snapshot of the EBP behaviours of the AHPs working at Cerebral Palsy Alliance at that point in time.

Limitations

RCT

There are a number of study limitations. First and foremost, the pragmatic constraints that limited the number of available clusters and participants led to low statistical power causing a probable type II error.

Second, the large differences observed between clusters suggest that we should have tailored the KT strategy to each cluster rather than the whole organisation as it appears the whole organisation was not homogenous.

Third, the evidence base regarding whether proxy behaviour measures represent actual behaviour is not firmly established, but with preferred rival direct measures also lacking validity and reliability.[189,218] Moreover, direct measurement was not affordable in our study given the geography involved, and indirect measurement tools were therefore used.[163,219] To minimise measurement bias, systematic review recommendations regarding indirect measures were followed, and included using: (1) acceptable indirect measures[189,219] (such as self- and peer-rated behaviour triangulated with unbiased web hit data),[152] (2) measurement tools with strong psychometric properties,[166] (3) more than one tool to measure behaviour change,[167] and (4) a sound theoretical model as a basis of the intervention.[55]

Fourth, the time frame of the trial was short considering that many EBP behaviours and system/organisational changes (such as documenting client goals and mentoring) take time to develop.[173] Fifth, the return rate of the GAS exam form and EBPAS was not perfect (60–82%), with the 8-week data having more missing data.

2-year follow-up study

First causal links between the original KT strategy and the 2-year data were unable to be definitively drawn for a number of reasons: (1) the nature of longitudinal design utilising survey methodology precluded certainty of findings, (2) at the 2-year mark there was no control group as both groups had received the interventions, (3) there was a lot of missing data due to staff turnover (47%) and low response rates. Low response rates are a consistent problem in research involving health professionals.[203,207] Low response rates lead to an unknown level of bias[207,211] as we cannot be certain whether this sample were indeed representative of all AHPs in the organisation.

Recommendations

Future research

First, documenting the detail of each component of KT strategies along with barriers and facilitators is integral so that replication of successful strategies amongst AHPs is possible.[16] Second, the RCT highlighted the methodological challenges of conducting empirical research in a community-based organisation with fixed cluster and participant numbers. Whether or not RCTs are a feasible option in community organisations is debatable. For this reason, conducting future KT research in the context of a solid theoretical framework or model, such as the KTA process is highly recommended. It may be that other research designs such as case studies, interrupted time series, qualitative studies and mixed methods are more appropriate[164,220] to further explore which KT strategies are most effective. Third, the follow-up study encountered the well-reported problem amongst health professionals of low response rate, and it may be that incentives need to be offered to improve this.[203] Fourth, research is needed measuring the effectiveness of KT strategies to improve not only AHPs' EBP behaviour, but also the impact of KT strategies on client outcomes. Fifth, research is needed regarding the relative cost-effectiveness of KT strategies especially given that many components of KT strategies (workshops, paid EBP time, maintenance of evidence-based resources) are likely to be costly and ongoing.

Recommendations for organisations

Barriers assessment targeting subgroups

KT literature recommends tailoring KT strategies to overcome known barriers within organisations,[65,221] however our findings suggest that this may need to go even further with KT strategies being designed for subgroups within an organisation. The impact of different workplace micro-cultures may mean that there are dramatically different barriers needing different KT strategies to be effective.[15]

Ongoing process of knowledge translation

All organisations experience turnover of staff including managers, AHPs and decision makers. When existing staff leave an organisation or new staff join there is an inevitable shift in organisational and interpersonal dynamics. The resultant dynamic may facilitate or impede the flow of research into practice. This means that monitoring EBP behaviour and assessing new barriers and facilitators is not a one-off task, but rather continuous, as depicted in the KTA process. The KTA process provides a flexible, pragmatic model to design, implement and measure a KT strategy in any setting. Decision makers need to be aware that embarking on KT to improve EBP behaviour is an ongoing long-term endeavour that may require extra resources.

Targeting managers and decision makers

Considering the importance of management-led change, targeting policy makers and managers may be beneficial. No studies directing KT to policy makers/management was found in the allied health literature. In the public health domain, Dobbins et al.[164] found that sending individualised evidence to decision makers at the right time, led to an increase in evidence based policies. As managers are key people involved in implementing systemic changes that can lead to EBP behaviour changes, targeting KT strategies to managers and decision makers may be a wise use of resources.

Development and maintenance of evidence-based resources

Provision of high quality evidence is the cornerstone to KT, and evidence-based resources such as the EAS are therefore critical. Evidence-based resources need to be regularly updated to reflect most recent research findings and accommodate needs of AHPs [13]. This role can be time consuming and decision makers need to ensure that adequate resources are allocated. The cost of employing staff to build and maintain an evidence-based resource may however be less than the cost of each AHP's time to search and appraise research individually. Although resources such as the

EAS are an integral part of KT, published studies suggest that provision of evidence-based resources such as the EAS, are not enough to change EBP behaviour.[13,164,203] It is therefore recommended that an evidence-based resource is one part of an ongoing KT strategy, and the EAS be developed further. In order for the EAS to be a level 5 evidence based information resource on the 5S pyramid, content would need to be integrated into client documentation systems to ensure that evidence is always a part of AHPs' clinical decision making. Evidence that is individualised to the person and embedded so that the right information is delivered at the right time ('push' messages) are considered the gold standard.[13,164]

Co-operation between organisations

Considering that the development and maintenance of evidence-based resources are costly and complex, opportunities for organisations to collaborate may be mutually beneficial.[222] The opportunity for organisations to co-operate may however extend further than this. KT strategies could be designed jointly with barrier assessments conducted for each setting. Commonly beneficial KT strategies such as workshops and research syntheses could be developed and delivered collaboratively, saving significant resources and potentially improving overall outcomes.

Conclusion

This thesis presents original research investigating the effectiveness of KT strategies with AHPs. Two studies measuring change in EBP behaviour were conducted and although EBP behaviour appeared to improve in the hypothesised direction, methodological issues due to pragmatic constraints preclude certainty of our findings. This raises the question as to whether other research designs may be better suited to KT research in community-based organisations.[164] Despite this, both studies make an important contribution to the scant AHP evidence base in KT.[16,66] Our findings suggest that KT is a long-term process and KT strategies need to be customised to

subgroups within an organisation. Researchers, policy makers and clients need to effectively collaborate to ensure that reliable, relevant research becomes embedded into everyday care in an ongoing way.