British Journal of Nursing

A Nursing dilemma: communicating using a new vitamin B12 deficiency leaflet

--Manuscript Draft--

Manuscript Number:	bjon.2019.0116
Full Title:	A Nursing dilemma: communicating using a new vitamin B12 deficiency leaflet
Short Title:	communicating using a new vitamin B12 deficiency leaflet
Article Type:	Original research
Keywords:	Communications; B12 deficiencies
Corresponding Author:	Bryan McIntosh, PhD University of Stirling Stirling, Stirlingshire UNITED KINGDOM
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	University of Stirling
Corresponding Author's Secondary Institution:	
First Author:	Ariadna Ortet-Walker
First Author Secondary Information:	
Order of Authors:	Ariadna Ortet-Walker
	Ayla Ponsford
	Bryan McIntosh, PhD
Order of Authors Secondary Information:	
Abstract:	The aim of this quality improvement (QI) development was to improve patients' knowledge about their vitamin B12 deficiency by creating an information leaflet and engaging nursing staff in providing this educational tool to patients with the condition. An increase in patient knowledge post-leaflet was predicted.
Suggested Reviewers:	
Additional Information:	
Question	**Response**
Please enter the **word count** of your manuscript	2118

This document is the Accepted Manuscript version of a Published Work that appeared in final form in *British Journal of Nursing*, copyright © MA Healthcare, after peer review and technical editing by the publisher. To access the final edited and published work see https://doi.org/10.12968/bjon.2019.28.22.1450

Powered by Editorial Manager® and ProduXion Manager® from Aries Systems Corporation

Title page

A Nursing dilemma: communicating using a new vitamin B12 deficiency leaflet.

Ariadna Ortet-Walker, University of Stirling

Ayla Ponsford, University of Stirling

Bryan McIntosh, Ph.D. Associate Professor , University of Stirling

Click here to view linked References

A Nursing dilemma: communicating using a new vitamin B12 deficiency leaflet.

Introduction

Paterick et al. (2017) argued receiving education regarding a condition is the key to patients achieving positive health outcomes and engaging in treatment. The Nursing and Midwifery Council (NMC) Code requires that nurses should respect the impact people can make to their health. Subsequently, nurses should work in partnership with people, assisting them to access relevant health information when needed (NMC 2018).

The aim of this quality improvement (QI) development was to improve patients' knowledge about their vitamin B12 deficiency by creating an information leaflet and engaging nursing staff in providing this educational tool to patients with the condition. An increase in patient knowledge post-leaflet was predicted.

The project engaged with patients with vitamin B12 deficiency attending regular appointments. As part of their treatment regime, patients attending the treatment room received hydroxocobalamin intramuscular injections administered by nursing staff. Patients with a vitamin B12 deficiency should receive education on their condition as part of its management (Orton 2012). A vitamin B12 deficiency can cause a variety of symptoms such as fatigue, glossitis or a diversity of neurological manifestations (Langan and Goodbred 2017). Through an initial patient questionnaire from a sample of 105 patients, it was established that patients' knowledge about their condition was very low. Also, a baseline audit measuring if nurses were providing vitamin B12 deficiency information to patients showed percentage compliance was only 10%. Furthermore, nursing staff reported not having an educational tool available. This resulted in verbal information given to patients being inconsistent and not always evidence-based.

Following these results and discussions with the nursing staff, creating an educational leaflet (see Appendix A), to provide patients with increased knowledge about their condition, was established as a solution to the problem. The use of information leaflets increases patient knowledge and satisfaction according to a systematic review conducted by Sustersic et al. (2017). Moreover, the use of these leaflets has been associated with increased adherence to treatment (Sustersic et al. 2017). The nursing role has evolved throughout development of the profession; evidence suggests well-trained nurses can have a substantial effect on patients' satisfaction and adherence to treatment (Coster et al. 2018).

Planned changes tested

Gaining an understanding toward the reasons leading to the lack of educational information being provided to patients was essential in devising the processes to test and their solution. During the first five weeks of placement, observing practice and meeting with the nursing staff helped to evaluate the problem. Baseline data on nurses' compliance providing information to patients with vitamin B12 deficiency was measured with weekly audits in a two-week period. The result of this showed a low compliance of only 10%. This information was organised and a

fishbone diagram was created to display and help analyse the underlying causes of the problem. The identified common themes leading to nurses not providing patients with educational information were the lack of educational material available and the lack of structure on when and what information to give patients. Thus, the creation and introduction of an educational leaflet was established as a beneficial solution. The leaflet was created using the National Health Service (NHS 2016) information on a vitamin B12 deficiency. It also incorporated a lifestyle advice section, as diet and smoking have been associated to development of vitamin B12 deficiency (Laird et al. 2018; Damayanti et al. 2018).

Following the Model for Improvement (Langley et al. 2009), a plan was created which set the outcome, process and balancing measures for the project. One-hundred per cent compliance of nurses providing educational information to patients with vitamin B12 deficiency. Also, patients' knowledge was expected to increase after receiving the leaflet. Additionally, a balancing measure was set to measure if receiving the leaflet had any effect on patients' desire to change aspects of their lifestyle to benefit their condition.

Two Plan, Do, Study, Act (PDSA) cycles were run to test the introduction of the leaflet. In week 6, PDSA cycle 1 was developed and nurses were asked to give every patient with vitamin B12 deficiency who wanted information a leaflet. A folder with printed leaflets was positioned on the shelves at the nurses' desks in the three treatment rooms. Compliance of nurses providing educational information was measured through weekly audits. The results of this PDSA cycle over a 3-week period showed a mean of 67% compliance compared to the initial 10% compliance at baseline. This was a significant increase but as it did not meet the goal of 100% compliance a second PDSA cycle was created in week 9. Through discussion with nursing staff, it was recognised that not handing out the leaflet on occasions was due to its location not providing a visual prompt. Printed leaflets were positioned in the three treatment rooms in a poly-pocket stuck to the notice board located directly above the injection trolley. This was to provide a visual prompt when the nurse was going to give a hydroxocobalamin injection. This change resulted in the mean compliance increasing to 93% during the 3-week period. The goal of 100% compliance was consistently met in the last 2-week period of this cycle.

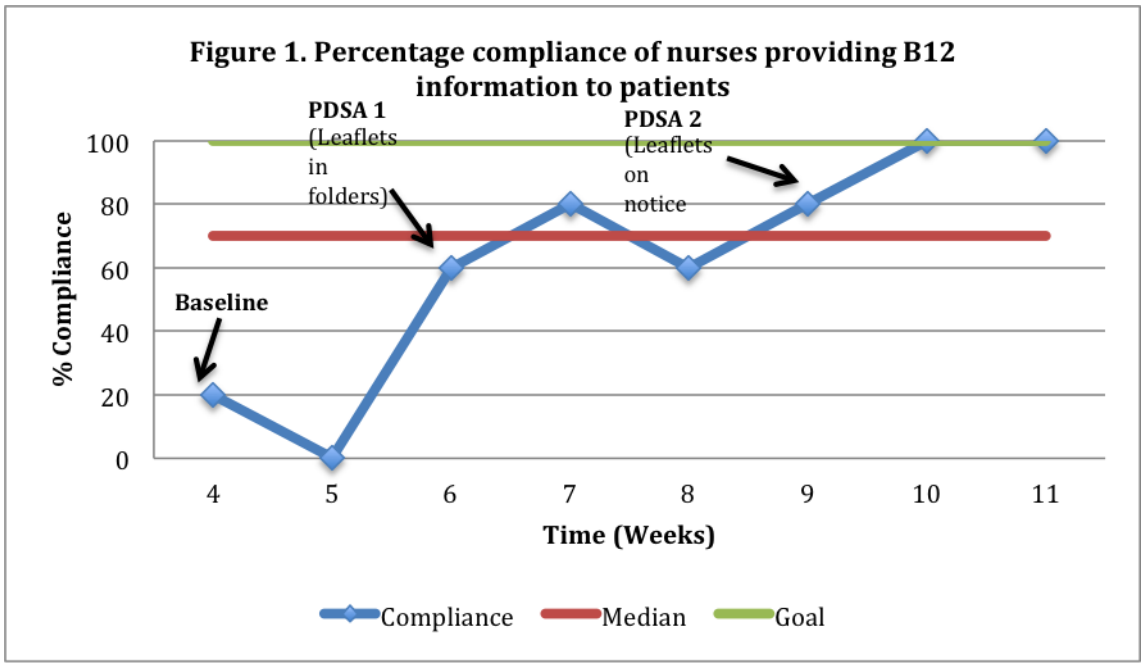
During the six-week period running the two PDSA cycles, post-intervention questionnaires were given out to a sample of 25 patients in total. These were administered to users who had received the leaflet from the nurses and completed the baseline questionnaire in the first five weeks of the practicum. The results were analysed and showed a significant increase in patients' mean knowledge score after having received the leaflet. This met the practicum's aim of improving patient knowledge with the use of an educational leaflet. Additionally, the balancing measure gathered simultaneously in the post-intervention questionnaire showed positive results as a number of patients expressed the desire to change aspects of their lifestyle to benefit their condition after reading the leaflet such as: incorporating foods with vitamin B12 into their diet, attending appointments for injections regularly and reducing smoking.

Nurses' and patients' views on the usefulness of the leaflet were also compiled. Patients' views were gathered in the post-intervention questionnaire, which showed they rated the leaflet a

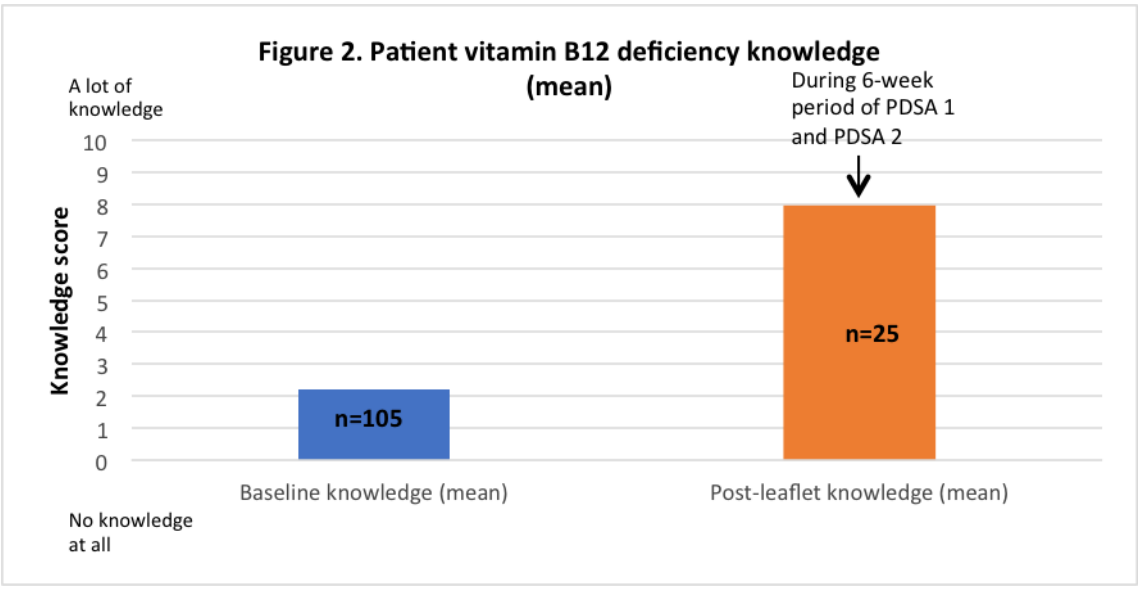
mean of 9.28 in usefulness on a scale of zero to ten (0-10). Nurses' views and comments were collected during the two PDSA cycles and the final meeting following the test where they expressed that they found the leaflet extremely useful; that it assisted them to provide reliable education to patients in a timely manner. They were also very happy with the effect the leaflet had on patient knowledge and desire to change aspects of their lifestyle to benefit their condition.

Findings

The run chart below displays percentage compliance of nurses providing B12 information to patients. Baseline compliance measured during weeks four and five show percentage compliance had a mean of 10%. The goal was to accomplish 100% compliance during the following 6-week period. PDSA cycle 1 introduced leaflets in folders, increasing percentage compliance to a mean of 67% during weeks six to eight. Although there was a substantial increase in compliance the data points at week six and eight were below the median. PDSA cycle 2 with leaflets positioned on notice boards which increased percentage compliance to a mean of 93% during weeks nine to eleven. All data points during this period were above the median. The 100% compliance goal was reached consistently during weeks ten and eleven.

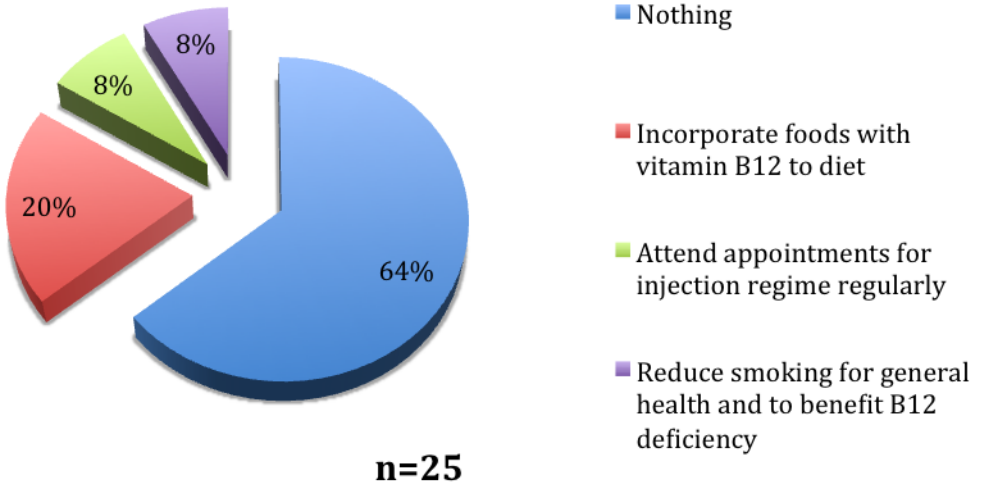


The bar chart below displays mean vitamin B12 knowledge score on a scale of zero to ten (0 to 10) of a patient sample before and after receiving the leaflet. Baseline data displayed shows the mean knowledge of a sample of 105 patients was 2.21 during the five-week period before introducing the leaflet. Post-leaflet knowledge on a sample of 25 returning patients shows knowledge increased to a mean of 7.96 during the six-week period of running PDSA cycle 1 and 2, when the leaflet had been introduced. This was a substantial increase of 5.75 in knowledge mean score.



The pie chart below displays the balancing measure of desire to change aspects of lifestyle after reading the leaflet. This data was gathered in the post-intervention questionnaire from a sample of twenty-five patients during PDSA cycle 1 and 2.

Figure 3. Desire to change aspects of lifestyle (post-leaflet)



Discussion

Nurses should work in partnership with people, assisting them to access relevant health information when they need it (NMC 2018). This QI practicum achieved the aim of improving the knowledge of patients with vitamin B12 deficiency. Following the introduction of a created leaflet, the nursing team met the 100% compliance of providing educational information to patient's goal, in the last two-week period. Also, receiving the educational leaflet led to an increase in a sample of patients' mean knowledge score of 5.75. Moreover, the balancing measure results showed 36% of patients reported wanting to change aspects of their lifestyle

to benefit their condition after having received the leaflet. The improvement in patients' knowledge achieved the desired person-centred care approach while building a therapeutic relationship to increase satisfaction and involvement in care (Doherty and Thomson 2014). The preliminary results were successful, although gathering follow-up data would have been beneficial in assessing whether or not the change could be sustainable.

Arrangements for hand-over of the project were discussed and organised with the nursing team in a final meeting during the last week of placement. The leaflet was saved on the computers of the treatment rooms to print as needed. The nurses reported feeling motivated to keep providing the educational leaflet to any patients who required information and said they were happy with the visual prompt of the leaflets on the notice boards above the injection trolley. It was also established that, when newly diagnosed patients or new patients with vitamin B12 deficiency first visited the treatment room, nurses would systematically provide them with the leaflet and discuss any queries. Furthermore, the community district nursing team showed great interest in the leaflet as they had patients with vitamin B12 deficiency on their caseload. Beyond the scope of the original project, the leaflet was put on the electronic community-shared folder so that the community nursing staff had easy access to it. Nursing staff were very positive and enthusiastic about the use of the tool on a day-to-day basis in the treatment room and beyond. However, continued implementation following the QI project cannot be guaranteed without further monitoring of nurse compliance. Consequently, nurses were provided with the audit form and the run chart to continue monitoring compliance.

In conclusion, the introduction of the created leaflet accomplished a favourable improvement to patients' knowledge in this clinical setting. In view of the success rate found in the treatment room, the use of this educational tool in caring for patients with vitamin B12 deficiency could be beneficial in other community and acute healthcare settings.

References

Coster, S., Watkins, M. and Norman, I.J. (2018) What is the impact of professional nursing on patients' outcomes globally? An overview of research evidence. *International Journal of Nursing Studies*, 78, pp. 76-83.

Damayanti, D., Jaceldo-Siegl, K., Beeson, W. L., Fraser, G., Oda, K. and Haddad, E. H. (2018). Foods and Supplements Associated with Vitamin B_{12} Biomarkers among Vegetarian and Non-Vegetarian Participants of the Adventist Health Study-2 (AHS-2) Calibration Study. *Nutrients*, 10 (6), pp. 1-11.

Doherty, M. and Thomson, H. (2014) Enhancing person-centered care through the development of a therapeutic relationship*. British Journal of Community Nursing*, 19 (10), pp. 502-507.

Laird, E., O'Halloran, A.M., Carey, D., O'Connor, D., Kenny, R.A. and Molloy, A. M. (2018) Voluntary fortification is ineffective to maintain the vitamin B12 and folate status of older Irish adults: evidence from the Irish Longitudinal Study on Ageing (TILDA). *British Journal of Nutrition,* 120 (1), pp. 111-120.

Langan, R.C. and Goodbred, A.J. (2017) Vitamin B12 deficiency: recognition and management. *American Family Physician*, 96 (6), pp. 384-389.

Langley, G., Moen, R., Nolan, K., Nolan, T., Norman, C. and Provost, L. (2009) The Improvement Guide: A Practical Approach to Enhancing Organizational Performance. 2nd ed. San Francisco: Jossey-Bass.

National Health Service (2016) *Vitamin B12 or folate deficiency anaemia*. National Health Service. Available: https://www.nhs.uk/conditions/vitamin-b12-or-folate-deficiency-anaemia/ [Accessed: 14th November 2018].

Nursing and Midwifery Council (2018) *The Code: Professional standards of practice and behaviour for nurses, midwives and nursing associates*. London: Nursing and Midwifery Council. Available: https://www.nmc.org.uk/globalassets/sitedocuments/nmc-publications/nmc-code.pdf [Accessed: 18 October 2018].

Orton, C.C. (2012) Vitamin B12 (Cobalamin) Deficiency in the Older Adult. *The Journal for Nurse Practitioners*, 8 (7), pp. 547-553.

Paterick, T.E., Patel, N., Tajik, J. and Chandrasekaran, K. (2017) Improving health outcomes through patient education and partnership with patients. *Baylor University Medical Center Proceedings*, 30 (1), pp. 112-113.

Sustersic, M., Gauchet, A. and Foote, A. (2017) How best to use and evaluate Patient Information Leaflets given during a consultation: a systematic review of literature reviews. *Health Expectations*, 20 (4), pp. 531-542.

Fig 1. B12 Leaflet

Click here to download Figure (i.e. diagram, illustration, photo) B12 trifold.pdf

Appendix A: 'Living with vitamin B12 deficiency' trifold leaflet (1)

The following two pages were printed double-sided in colour on an A4 sheet of paper, subsequently folded in three parts to create a trifold leaflet.

What is vitamin B12 deficiency?

Vitamin B12 deficiency is the result of a lack of vitamin B12 in the body. This causes the production of abnormally large red blood cells that can't carry out their function.

This condition affects all ages of people but is more common in older people. 1 in 10 people aged 75 or over develop vitamin B12 deficiency.

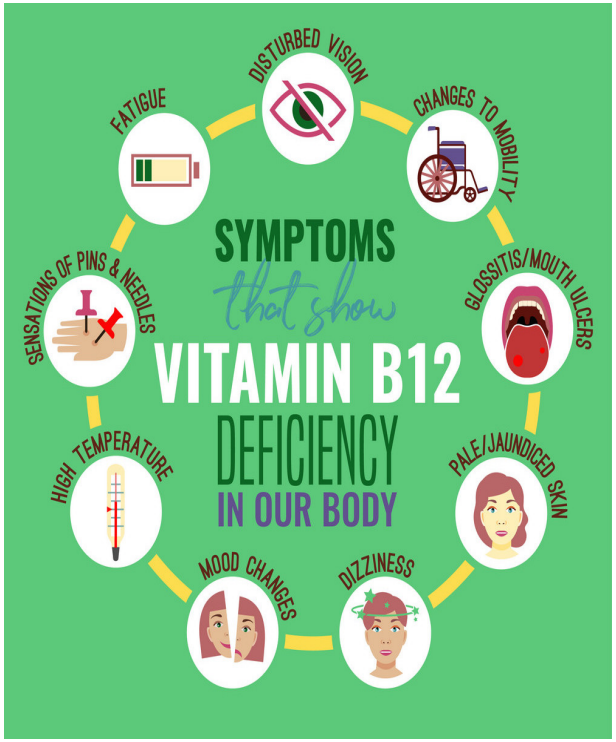
Causes

Healthy cells in the stomach are attacked by the immune system, impeding the body from absorbing vitamin B12 from the food we eat.- Pernicious anaemia.

Shortage of vitamin B12 caused by poor diet, vegan diet or following fad diets.

Some medications can affect the absorption of vitamin B12. For example: anticonvulsants.

Symptoms



https://www.vectorstock.com/royalty-free-vector/vitamin-b12-deficiency-vector-21742105

Treatment

Vitamin B12 supplements can be given by injection. The injections will usually be prescribed by a doctor and administered by a nurse.

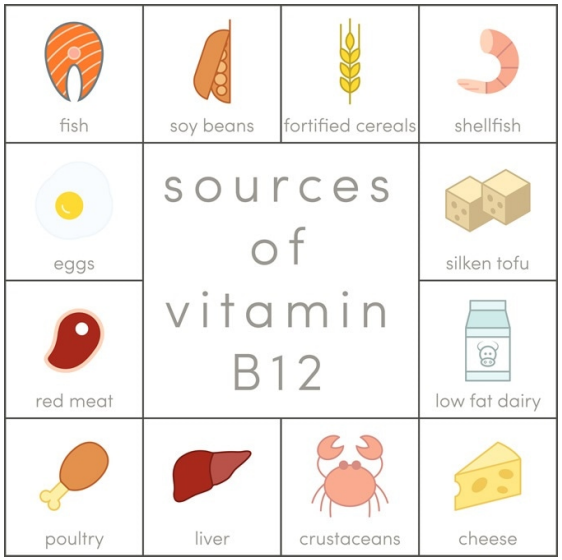
The GP will monitor the progression of the condition through blood tests.

Depending on the cause of the B12 deficiency, supplement tablets between meals, dietary advice or regular injections will be recommended.

These treatments may be needed for life.

Dietary and lifestyle advice

In some cases, depending on the cause of your vitamin B12 deficiency, improving your diet can help treat the condition and prevent it recurring.



https://www.blackmores.com.au/energy/what-you-need-to-know-about-vitamin-b12

Smoking has also been associated to the development of vitamin B12 deficiency.

Created by: Ariadna Ortet-Walker (Student nurse).
Developed: 20th December 2018.

Bibliography:

-National Health Sevice (2016) Vitamin B12 or folate deficiency anaemia. Available: https://www.nhs.uk/conditions/vitamin-b12-or-folate-deficiency-anaemia/ [Accessed: 1st November 2018].

-Laird, E., O'Halloran, A. M., Carey, D., O'Connor, D., Kenny, R. A. and Molloy, A. M. (2018). Voluntary fortification is ineffective to maintain the vitamin B12 and folate status of older Irish adults: evidence from the Irish Longitudinal Study on Ageing (TILDA). *British Journal of Nutrition,* 120 (1), pp. 111-120.

- Damayanti, D., Jaceldo-Siegl, K., Beeson, W. L., Fraser, G., Oda, K. and Haddad, E. H. (2018). Foods and Supplements Associated with Vitamin B_{12}Biomarkers among Vegetarian and Non-Vegetarian Participants of the Adventist Health Study-2 (AHS-2) Calibration Study. *Nutrients*, 10 (6), pp. 1-11.

UNIVERSITY of STIRLING

NHS

LIVING WITH VITAMIN B12 DEFICIENCY

https://www.vectorstock.com/royalty-free-vector/food-sources-of-vitamin-b12-green-spinach-chicken-vector-21528695