

Analysis Adequate Between Vitamin D Intake and Dementia in the Elderly in Community Health Center Work Areas

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Abstract. Based on population projection data, it is estimated that in 2017 there will be 23.66 million elderly people in Indonesia (9.03%). The number of elderly people is estimated in 2020 (27.08 million), 2025 (33.69 million), 2030 (40.95 million) and 2035 (48.19 million) (Ministry of Health of the Republic of Indonesia, 2017). The prevalence of dementia (per 1000 population) in Indonesia in 2005 was 191.4 incidents, in 2020 it is estimated to be 314.1 incidents, and will increase in 2050 to around 932 incidents. Data obtained in the work area of the Telaga District Health Center included 134 elderly people, 38 of whom suffered from dementia. From the results of interviews obtained from health workers at community health centers and families, it was said that elderly people often forget many activities such as bathing, taking medicine and so on, so the family has to remind them to take a bath, take medicine and so on. In further interviews conducted by researchers with elderly people, some said that they rarely consumed vitamins, especially vitamin D, were lazy about exercising, doing light activities or sunbathing every morning which could increase their risk of developing dementia.

Keywords: Dementia, Vitamin D, Elderly

INTRODUCTION

Enhancement amount elderly bring consequence separately especially in the field health that is happen transition epidemiology disease from disease infection infectious become diseases degenerative like decline function Cognitive is one of them dementia that can be a problem for elderly nor family and environment (Anorital, 2016) .

Changes experienced by the elderly that is change physiological, change behavior psychosocial, and change cognitive. Old people carry on experience decline function cell the brain causes it decline Power remember period short, difficult concentrating, and slowing down information processing so that can result difficulty communicate. Brain will experience change function, incl function cognitive form difficult remember return , decrease ability in take decision, and act more slow (Agustia et al., 2014) . One of suspected abnormality own connection with decline function cognitive This is exists vitamin D deficiency (Anorital, 2016).

Based on study Eyles, et al vitamin D can synthesized and metabolized in a way local to the nervous system centers that are influenced by existence 1-hydroxylase enzyme as well found Lots Vitamin D receptors are located in the hippocampus, cortex and limbic system which are areas for function cognitive. In humans, vitamin D is Hormones that regulate neurotransmission , *neuroprotection* , *neuroimmunodulation* and other processes in the brain (Cui et al., 2017) .

According to *Alzheimer's Disease International*, dementia is something syndrome decline ability intellectual progressive causing deterioration cognitive and functional, so result disturbance function social, work and activities daily. Setbacks function cognitive influenced by various factors ; beside factor individual like age, education and previous illnesses suffered factor environment allegedly follow influence risk setback function cognitive , like relationship / involvement social (social engagement) and activities , good activity physique nor activity cognitive . Activity For fill in time leisure in the elderly can lower risk dementia. Type activity the involve function cognitive and physical. In elderly people who do activity involve function cognitive can lower risk dementia (Alifiah, 2017)

Based on matter That 's interesting interest researcher For do study with title " The Relationship Between Adequacy Vitamin D Intake With Incident Dementia in the Elderly in Work Areas Public health center Lake”

RESEARCH METHODS

Type research used is study analytic with cross sectional design for know connection between adequacy intake of vitamin d with incident dementia in the elderly in the work area Public health center Lake. Cross-sectional research is something study For learn dynamics correlation between factors risk with effect, with method approach, observational, or data collection. Cross-sectional research only observe very course and measurement done to variable subject at the moment research (Notoatmojo, 2016).

Sample in study This is elderly in the work area Public health center suffering lake dementia a total of 38 people. Engineering taking sample in study This is the total sampling. Total sampling is technique taking sample Where amount sample The same with population. Reason take total sampling because amount underpopulation of 100. So the amount sample in study This is as many as 38 people.

RESULTS AND DISCUSSION

Analysis Univariate

Characteristics			
No	Respondent	n	%
Age			
1	60 – 74 Years	32	84.2
2	75 – 90 Years	6	15.8
Type Sex			
1	Man	7	18.4
2	Woman	31	81.6
Education			
1	elementary school	15	39.5
2	JUNIOR HIGH SCHOOL	15	39.5
3	SENIOR HIGH SCHOOL	3	7.9
4	PT	5	13.2
Amount		38	100.0

Based on table 3 above show that group age respondents majority aged 60-74 years a total of 32 people (84.2%) and a minority in the group aged 75-90 years a total of 6 people (15.8%). Based on type sex respondents majority is Woman a total of 31 people (81.6%), were followed minority respondents man a total of 14 people (18.4%). Based on education show that group education respondents majority are at the elementary and middle school levels, namely 15 people each (39.5%), and are minorities are on a level high school education, namely a total of 3 people (7.9%).

Table 2

Distribution Vitamin D Intake in the Elderly in Work Areas Public health center

Lake

No	Vitamin D Intake	n	%
1	Vitamin D Deficit	22	57.9
2	Good Vitamin D Intake	16	42.1
Amount		38	100.0

Based on table above, obtained majority elderly experience deficit Vitamin D intake was 22 people (57.9%) and was a minority is elderly with good vitamin D intake a total of 16 people (42.1%).

Analysis Univariante

Analysis Univariante Based on Community Knowledge

Analysis Univariante Based on Indicator Community Knowledge

Diagram 1: Distribution Respondent Based on Indicator Knowledge of the Coffee Village Community in the District North Bulango

Table 4

Distribution Tiers Function Cognition in the Elderly in the Work Area Public health center Lake

No	Cognitive Level	N	%
1	Good / Normal	10	26.4
2	Light	4	10.5
3	Currently	7	18.4
4	Heavy	17	44.7
Amount		38	100.0

Based on table above, obtained majority elderly own level function cognitive heavy that is a total of 17 people (44.7%) and minorities elderly own level function cognitive light namely 4 people (10.5%).

Table 15

Connection between adequacy intake of vitamin d with incident dementia in the elderly in the work area Public health center Lake

Keadudukan Asupan Vitamin D	Tingkat Fungsi Kognitif (Demensia)								Total	X ²	P Value
	Baik/Normal		Ringan		Sedang		Berat				
	n	%	n	%	n	%	n	%			
Defisit	0	0	0	0	7	31.8	15	68.2	22	58.0	30.761 0.000
Baik	10	62.5	4	25.0	0	0	2	12.5	16	42.0	
Jumlah	10	26.3	4	10.5	7	18.4	17	44.8	38	100.0	

Based on table 4 above can be known that of 38 respondents, the majority elderly are on a level function cognitive heavy that is a total of 17 people (44.8%). From the amount those who experience it Vitamin D deficit was 15 people (68.2%) and their vitamin D intake Good is a total of 2 people (12.5%).

Based on statistical test results with using the *chi square* test was obtained mark p value $(0.000) < \alpha (0.05)$, if $p < \alpha$ means hypothesis accepted. Statistics and methods *chi square* results p value = $(0.000) < = 0.05$. which means H_a is accepted. With thereby can interpreted that there is connection between adequacy intake of vitamin d with incident dementia in the elderly in the work area Public health center Lake.

Discussion

a. Age

Results study show that group age respondents majority aged 60-74 years a total of 32 people (84.2%) and a minority in the group aged 75-90 years a total of 6 people (15.8%). According to (Uliyah et al., 2019) On further age, can't remember is one of function cognitive experience that often occurs. Inheritance, in nature period time t age 60-74 year obtained setbacks in some ability with difference between broad individuals because abnormal proteins form in the brain, for example *amyloid- β* and tau proteins that can cause tangling nerves, attack axon so that influence delivery memory to brain. Survey carried out by Dementia UK in 2017 sufferer dementia the more increase possibility happen dementia in group 60 years old to on. Almost 40% of people are over 65 years old own disturbance memory, at the moment No There is influence from drugs, also called "*age-associated memory impairment*", p This is a normal aging process.

Assumption researcher Where the more tall age respondents will experience decline function brain so that young forget will What's new just done because happen tangling nerve as well as the normal aging process when pattern life No guarded or not done stimulation cognitive For prevent dementia. Based on explanation above, concluded that age relate tightly with incident advanced dementia aged 60 years to the top.

a. Type Sex

Research result show that in the group type sex respondents majority is Woman a number 31 people (81.4%), followed minorities respondents man a number 7 people (18.6%). According to (Damarianti & Karlina, 2019) Woman more risky tall experience disease Alzheimer's dementia than men. This is caused Because method Woman finish problem more emotional, sensitive, dependent, and passive, whereas man more independent,

emotional more stable, dominant and more impulsive. Difference level stress also affects reason dementia, male more low level the stress than Woman. His height incident Alzheimer's disease in women can explained Because level continuity life or endure life more higher in women and higher estrogen levels low in women carry on age.

Researcher assume that in the elderly Woman more risky For experiencing stress due to inability For control problems and imbalances as well as an increase in the hormones estrogen and cortisol tends to increase cause elderly experiencing stress so influence emotional approaching sleep and time Sleep elderly. More estrogen hormone dominant in women can help protect function brain at age young, but when reach age where is the hormone? start experience decline so function protection is also increasing decreased, aside it's the hormone cortisol If level tall will can disturbing delivery signal intercellular, killing cell influential brain in the memory process. Based on explanation that, you can concluded that type sex relate tightly with incident dementia because risk high in women in perception emotional as well as imbalance hormones and things that can trigger

b. Education

Research result show that group education respondents majority are at the elementary and middle school levels, namely 15 people each (39.5%), and are minorities are on a level high school education, namely a total of 3 people (7.9%). According to (Maryam & Hartini, 2019) Level more education tall, capable tolerate more Lots disease in the brain as well as prevent emergence dementia and the educated tall No have risk dementia Where show signs function more nerves good inside his brain compared to with educated people more low. Whereas Research conducted by Epidemiological *Clinicopathological Studies in Europe (EclipSE)* suggests that respondents who have a higher level of education tall previously can reduce risk For experience dementia with age old. report that risk Alzheimer's disease is increasing double in people who have less from eight year enjoy education.

Researcher assume that the more low education respondents so more risky experience changes to function brain, so experience decline cognitive, because not enough thinking, networking brain over time will off and can also be annoying activity base everyday. Based on description Thus, the conclusions obtained that education is related tightly with incident advanced dementia age

Vitamin D Intake in the Elderly in Work Areas Public health center Lake

Majority elderly experience deficit Vitamin D intake was 22 people (57.9%) and was a minority is elderly with good vitamin D intake a total of 16 people (42.1%).

Source main of vitamin D besides exposure ray sun is intake vitamin D foods. However

in a way natural, the food we eat consumption daily except product foods fortified with vitamin D, contain a little vitamin D. Apart That Vitamin D intake possible influenced by factors social economy and style life , for example low vitamin D levels , have Lots noted occurs in income groups low (Haranti , RW, 2018).

On research This is low Vitamin D intake in 16 respondents (42.1%) was caused by lack of variation in consume food daily . Most subject consume the same vegetables and side dishes in One day and source Vitamin D foods are mostly on the subject study only eat sea fish as well as tofu and tempeh Because Enough easy obtainable and affordable in a way economy . Besides That's a good source of vitamin D classified difficult For obtained in the area rural areas , for example shrimp , mushrooms , milk and so on economical relatively expensive is one of them reason lack of Vitamin D intake in subjects study . Besides That Vitamin D supplements are also given only on a few elderly specifically by the health center as experienced musculoskeletal disorders such as osteoporosis and so on , even though vitamin D is a must prescribed in a way regular For development nerves and function brain in prevent incident dementia .

Whereas Vitamin D adequacy in 22 respondents , from observations in the field customized with statement on the completed questionnaire , because elderly open window room For let sun come in in the morning day , routine sunbathing in the morning day with duration $\pm 15 - 30$ minutes . Exposure ray sun is what is the best source of vitamin D and what is not there is case Vitamin D intoxication due to exposure ray sun excessive . Ultraviolet B rays originate from sun will absorbed by the skin and then converts 7-dehydrocholesterol in the skin become previtamin D₃, next in a way spontaneous converted to vitamin D₃ and so on will undergo metabolism in the liver becomes 25(OH)D and becomes 1.25(OH)₂D₃ (Yosephin , 2020).

Tiers Function Cognition in the Elderly in the Work Area Public health center Lake

Majority elderly own level function cognitive heavy that is a total of 17 people (44.7%) and minorities elderly own level function cognitive light namely 4 people (10.5%). Based on observation in the field and answers questionnaire by respondents a total of 17 respondents own level function cognitive heavy for example , forget name , forgot date , as well month / year caused Because lack of do activity like reading , listening news and doing activity everyday , p This should made A habits of the elderly , some elderly too big difficulty For repeating the word as well remember instructed command . Meanwhile , 4 respondents had level function cognitive light part big No can reconstruct Instructed image.

Disease degenerative disease in the elderly is one of them is decline function cognitive. Function cognitive is a deep mental process obtain knowledge or ability as well as intelligence, which includes method thinking , power remembering , understanding , planning , and implementing . Function cognitive is dimensions important from quality life For elderly in all countries. This matter tightly connection with ability For processing information in life everyday and helpful form whole well-being during life. Setbacks function cognitive can form easy forget (*forgetfulness*), distraction cognitive mild (*Mild Cognitive Impairment / MCI*), up to to dementia as form the most severe clinical condition . *Mild Cognitive Impairment* is more symptoms heavy compared to easy forget. In *mild cognitive impairment* Already start appear symptom disturbance function memories that are disturbing and felt by the sufferer. *Mild cognitive impairment* is intermediary between disturbance memory or cognitive related age (*Age Associated Memory Impairment/AAMI*) and dementia . Most of the patient with MCI aware will exists deficit memory. General complaints form frustrating, slow in find object or remember person's name, and less capable carry out activity complex everyday life. Symptoms of MCI felt by sufferers naturally influence quality his life (Lestari, 2019).

Connection between adequacy Vitamin D intake with incident dementia in the elderly in the work area Public health center Lake

Research result show that of 38 respondents , the majority elderly are on a level function cognitive heavy that is a total of 17 people (44.8%). From the amount those who experience it Vitamin D deficit was 15 people (68.2%) and their vitamin D intake Good is a total of 2 people (12.5%).

Based on statistical test results with using the *chi square* test was obtained mark *p* value (0.000) < α (0.05), if $p < \alpha$ means hypothesis accepted . Statistics and methods *chi square* results *p* value = (0.000) < = 0.05. which means H_a is accepted . With thereby can interpreted that there is connection between adequacy intake of vitamin d with incident dementia in the elderly in the work area Public health center Lake .

Research result This in line with research conducted by (Hartanti, 2018) about “ The Relationship Between Adequacy Vitamin D Intake With Incident Dementia in the Elderly (In Telogosuryo Rw 02, Lowokwaru Malang City)” obtained a *p* value of $0.048 < 0.05$ which shows There is meaningful relationship between Adequacy Vitamin D Intake With Incident Dementia in the Elderly .

The role of vitamin D besides as balance and health bone is For prevent Alzheimer's disease / dementia Because vitamin D's ability to guard growth cell nerve . A number of study prove low vitamin D levels found in Alzheimer's sufferers . Reason Low vitamin D levels in

elderly people because happen factor aging with decline function skin in absorb ray sun and activates vitamin D. Besides That is , the aging process that occurs at age advanced (elderly) causes decline body organ function in carry out the vitamin D metabolism process (Cui et al., 2017) .

The low Vitamin D levels and risks Alzheimer's disease is caused by either vitamin D receptor section brain that has role in function memory . Vitamin D helps cell brain clean remnants of foreign and stimulating proteins regeneration cell nerve . Moment reduced vitamin D levels , occurs accumulation of foreign proteins in cells brain and produce destructive poison cell brain . Damage cell brain nature permanent so that can give rise to disturbance function memory or known with dementia , which if Already chronic can develop become Alzheimer's disease (Istianah et al., 2019) .

The involvement of vitamin D in function cognitive influenced by interaction vitamin D metabolites with the vitamin D receptor (VDR), which is part from group steroid receptors . The vitamin D-25(OH)D3 and 1,25(OH)D3 metabolites can pass barrier blood brain and engage in various function metabolism and neuroprotection in the arrangement nerve center , existence the enzyme 1-hydroxylase is also responsible responsible for the formation of vitamin D and the presence of a lot of VDR found in the hippocampus , cortex and limbic system which are key areas For function cognitive (Harna et al., 2020) .

Based on description above , researcher analyze that potency dementia can occurs in the elderly because inadequacy adequate vitamin D intake influence decline Vitamin D metabolism due to aging , as well decline function skin the elderly who absorb ray sun so that can activates vitamin D. Related with importance Vitamin D intake is necessary exists role from elderly and families in increase consumption Vitamin D intake by the elderly .

CLOSING

Conclusion

Based on results research that has been carried out by researchers on 5 October – 13 October 2021 in the Work Area Public health center Lake can withdrawn a number of conclusion as following :

1. Majority s Elderly manifold sex respondents majority is Woman a number 31 people (81.6 %), aged 60-74 years a total of 32 people (84.2%), elementary and middle school education , namely 15 people each (39.5%).
2. Majority elderly experience deficit Vitamin D intake was 22 people (57.9%) and was a minority is elderly with good vitamin D intake a total of 16 people (42.1%).
3. Majority L ansia are on a level function cognitive heavy that is a total of 17 people (44.8%).
4. There is connection between adequacy intake of vitamin d with incident dementia in the elderly in the work area Public health center Lake proven with statistics and *chi square test* results p value = (0.000) <= 0.05.

Suggestion

Based on results research and discussion, suggestions, in study This is :

1. For Society

As addition knowledge / insight for public specifically elderly For increase internal intake of vitamin D prevention incident dementia

2. For Profession Nursing

Research result This expected can used as development knowledge gerontic nursing . Besides That results are also expected can become something of value positive for profession nursing.

3. For Institution

Research result This can used as information for educational institutions in particular lecturers and all students to get it notice about consumption Vitamin D intake in the elderly has an influence on the health status of one of them function cognitive.

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